

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

UTUKUR, C.K.DINNE, KADAPA

**List of number of departments having research projects funded by
government agencies**

Name of the Project: DST-NIMAT Project

S.NO	Name of the Principal Investigator	Department of Principal Investigator	Year of Award and duration of the project	Amount Sanctioned INR in Lakhs	Name of the Funding Agency
1	Dr. A. Sudhakara Reddy	Mechanical	2019-20, One year	0.2	National Science & Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology
2	Dr. A. Sudhakara Reddy	Mechanical	2018-19, One year	0.2	National Science & Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology



College Code: HM

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES : KADAPA

(Approved by A.I.C.T.E., New Delhi & Affiliated to Jawaharlal Nehru Technological University Anantapur)

SUBMISSION OF PROPOSAL FOR THE CONDUCT OF AN ENTREPRENEURSHIP AWARENESS CAMP (EAC)

1. Name and address of the institution (with phone /fax no's)

ANNAMACHARYA INSTITUTE OF TECNOLOGY AND SCIENCES.

Behind R.T.O office, Utukur (p), C K DINNE, KADAPA.

Ph: 08562-201003, Fax: 08562-201005, Mail ID: shakeelkdp@gmail.com.

Mobile: 09441404099.

2. Brief introduction of the institution.

Annamacharya institute of technology and sciences (AITS) was established at Kadapa in a sprawling area of 25 Acres in the year 2010. AITS-KADAPA implies abode of innovative and technical skills which carve a niche to horn technical and scientific skills in the budding engineers and management students showcasing its enthusiasm in the national development to meet the global employability prerequisites.

AITS-KADAPA offers industry oriented programmes in various UG and PG courses such as Civil, EEE, Mechanical, ECE & CSE in UG (B.Tech) and VLSI System Design, CSE, EPS, Structural Engineering & Thermal engineering in PG (M.Tech). Every department is rich in its resources like well equipped laboratories having modern facilities, a well qualified, experienced, committed and dedicated teaching staff. Facilities are not only adequate for the present but also advanced enough to cater to the expanding requirements' of the future.


This institution is well connected with Rail, AIR and Road transportation facilities just 5 Km from Kadapa located at Bangalore highway.

3. Venue: AITS New Auditorium

4. Name of the camp coordinator: Dr.S.Shakeel Ahamed

QUALIFICATIONS: M.Tech, PhD, FIE, MISTE

EXPERIENCE: 20 Years.


PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (Utukur)

Exposure in the field of Entrepreneurship development:

Conducted several programmes (All self financed by the institution only) on Entrepreneurship development cell under the guidance of EDC coordinator.

(i) On 29.9.15 a programme of I.I.I (Industry-Institution-Interaction) organized by EDC of AITS Kadapa to create awareness to all the final year B.Tech students of various Engineering colleges located in around Kadapa district. General Manager Sri.J.S.Sanjivi of Shirdi Sai industries was the chief resource person.

(ii) On 10.2.2016 as a part of EDC activities, EDC of AITS Kadapa has organized a programme known as "Importance of Entrepreneurship for young Engineers". General Manager and joint director of Industries, Government of Andhra Pradesh, and Sri G.Gopal along with Assistant Director of industries Sri.C.Srinivas Yadav has enlighten the Establishment and importance of Industries in the country.


(iii) On 22.8.2016 as an extension of I.I.I (Industry-Institution-Interaction) organized by EDC of AITS Kadapa, Sri. B.Venkata Subbaiah Deputy Director National power training institute, ministry of power, Government of India, has created awareness on "Role of Entrepreneurship in an Engineers life"

5. Have the organization conducted similar programmes in past.

YES (All are self financed only, proof of the above programmes published in local news papers are enclosed)

6. If yes Date of sanction.

All the above programmes are conducted on self finance basis only.


PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dhone (V&M),
KADAPA - 516 003. (A.P.)

8. Details of the faculty to be Associated.

K.Srikanth M.Tech

Co-coordinator

Assistant Professor.

Department of Mechanical engineering.

AITS-KADAPA.


9. Target group:

Science and Technology final year degree / diploma students.

10. Budget estimates.

S.NO	Expenditure head	Amount in Rs.
1	Man power including honorarium to experts.	5000.00
2	Travel and industrial visit	4500.00
3	Miscellaneous &Contingencies	7500.00
4	Administrative overheads	3000.00
	Total	20,000.00

Date: 28-11-2017


Signature of the camp coordinator
Head of the Department
Mechanical Engineering.

Annamacharya Institute of Technology & Sciences
Itukur (P), C.K. Dinne (V&M), Kadapa (Dt.)



PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)


Signature of the head of the institution

PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

Annexure-III

DST-NIMAT project 2018-19

PROFORMA FOR STATEMENT OF AUDITED EXPENDITURE

Name of the Grantee institution : Annamacharya institute of technology and sciences.

Address : Behind RTO office
Utukur(P)
CK Dinne Kadapa

Sanction Letter No. & Date : EDII/DST-NIMAT/18-19/161
Dt. 03/07/2018

Amount : 20000/-

Purpose of Grant : *Industry Institution Interaction*

No	Items of Expenditure	Sanctioned Expenditure	Actual Expenditure	Variation	Reasons/Justification for Variation
1	Man power including honorarium to experts.	5,000/-	5,000/-	-----	-----
2	Travel & factory visit	4,500/-	4,500/-	-----	-----
3	Miscellaneous & contingency	7,500/-	7,500/-	-----	-----
4	Administrative over heads	3,000/-	3,000/-	-----	-----
	Total	20,000/-	20,000/-		

Total Rupees Twenty thousands only.

[Signature]
Signature.
(Head of Institution)
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

[Signature]
Signature.
(program co-ordinator)

[Signature]
Signature.
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

[Signature]
Signature.
Auditor(CA)

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

UTUKUR, C.K.DINNE, KADAPA

Research papers of teachers of AITS Kadapa in Journals indexed in UGC CARE/ Scopus/ Web of Science

INDEX

S.No	Title of the paper	Name of author	Name of the Journal	Page No.
1	An experimental study on effect of metakaolin and iron ore tailings on the properties of high strength concrete	Dr. P. Sri Chandana	Wutan Huatan Jisuan Jishu	1
2	Bioethanol production from green alga chlorococccum minutum through reduced Graphene Oxide-supported Platinum-Ruthenium (Pt-Ru/RGO) nanoparticles	Dr. P. Sri Chandana	Bioenergy Research	2
3	Heuristic ant colony and reliable fuzzy QoS routing for mobile ad hoc network	C. Venkata Subbaiah	Journal of Ambient Intelligence and Humanized Computing	3
4	Convolutional recurrent neural network with template based representation for complex question answering	A .Chandra Obula Reddy	International Journal of Electrical and Computer Engineering (IJECE)	4
5	Improving QOS in mobile adhoc networks routing using fuzzy inference algorithm	C. Venkata Subbaiah	Elsevier Materials today: Proceedings	5
6	Enhanced Power Control Method in DC Micro grid with Multi Level Converters	M.S.Priyadarshini and Y.Nagaraja	Mukt Shabd Journal	6
7	Quantum computational, spectroscopic and molecular docking studies of 5,5-dimethylhydantoin and its bromine and chlorine derivatives	S. Jaheer Basha	Chemical Data Collections	7
8	Automated detection system for texture feature based classification on different image datasets using s-transform	O.Homa Kesav	International Journal of Speech Technology	8
9	High Efficiency Dense Light Field and all-in Focus Compression for Lossless Satellite Image By Using CCSDS	P.Anjaneya	International Journal of Speech Technology	9
10	Bimetallic Pt-Cu-decorated reduced graphene oxide (RGO)-TiO ₂ nanocomposite for efficient oxygen reduction reaction	P. Sri Chandana	Synthetic Metals	10

S.No	Title of the paper	Name of author	Name of the Journal	Page No.
11	Thermal radiation and viscous dissipation effects on steady MHD heat and mass transfer flow of a micropolar fluid over an inclined isothermal permeable surface in the presence of thermophoresis	T. Sankar Reddy	Journal of Xidian University	11
12	Debris collection in water using purification techniques: A review	B.V.L.Sai Srujana and B.Bhargavi	Mukth Shabd journal	12
13	Hierarchy based firefly optimized K-means Clustering for complex question answering	A .Chandra Obula Reddy	Indonesian Journal of Electrical Engineering and Computer Science (IJECS)	13
14	Optimal distributed control of renewable energy based microgrid - an energy management approach	Y.Nagaraja	International journal of Ambient Energy	14
15	Quantum Computational, spectroscopic investigations on 6-aminobenzimidazole by DFT/TD-DFT with different solvents and Molecular docking studies	S. Jaheer Basha	Journal of Molecular Liquids	15
16	Analysis and Design of a robust controller for a grid-connected photovoltaic power plant	Y.Nagaraja	International Journal of Ambient Energy	16
17	Implications and implementation of biomedical waste management rules 2016 in hospitals and a common biomedical waste treatment facility in Andhra Pradesh, India	P. Sri Chandana	International journal of environment and waste management	17
18	Reduced graphene oxide supported Pd@Au core-shell nanoelectrocatalyst for enhanced oxygen reduction in alkaline media	P. Sri Chandana	International Journal of Hydrogen Energy	18
19	Facile fabrication of Pt-Ru nanoparticles immobilized on reduced graphene oxide support for the electrooxidation of methanol and ethanol	P. Sri Chandana	Chemistryselect	19
20	Biomedical Waste Management (BMW) Practices in the Pinnamaneni Siddhartha Hospital, India - A Case Study	P. Sri Chandana	A Glance at the world-Waste Management	20
21	Ultra-fine Pt-Ru bimetallic nanoparticles anchored on reduced graphene oxide sheets as highly active electrocatalyst for methanol oxidation	P. Sri Chandana	Materials Chemistry Frontiers	21
22	Preparation of High-Purity Ultrafine Copper Powder in Mass-Production by Chemical Reduction Method: Taguchi Robust Design Optimization	K. N. Shashi Kumar	Powder Metallurgy and Metal Ceramics	22

AN EXPERIMENTAL STUDY ON EFFECT OF METAKAOLIN AND IRON ORE TAILINGS ON THE PROPERTIES OF HIGH STRENGTH CONCRETE

R SUBBA RAYUDU¹ Dr. P. SRI CHANDANA²

¹M.Tech Student,

²HOD & Professor,

Annamacharya Institute of Technology & Sciences,
Kadapa,
A.P., India

Annamacharya Institute of Technology & Sciences,
Kadapa,
A.P., India

ABSTRACT

Concrete is basic common important material used in the construction industry in the past few decades, many research and modifications has been carried out to produce concrete with desired characteristics. There is always a research for concrete with higher strength and durability. The use of supplementary materials in cement is fundamental in developing low cost construction materials for use in developing countries. Concrete is the most widely used material having high compressive strength, by adding some of the pozzolanic materials, the various properties of concrete such as workability, durability, strength resistance to cracks and permeability can be improved with materials. To determine the physical properties of the river sand, crushed stone, metakaolin, iron ore tailings (IOT) such as specific gravity and grain size distribution and the mechanical properties of the control mix for M50 grade of concrete mix by considering optimum percentage of IOT as 30% constant and varying the metakaolin percentage i.e. 0,5,10,15 and comparing the results with the control mix at 7,14, 28 and 56 days. Tests were conducted to assess the physical properties of cement, metakaolin, fine aggregates, coarse aggregates and IOT. Mix design of M50 grade concrete is done by selecting suitable ingredient of concrete and determine their proportion. The samples were casted for 5 different mix proportions for metakaolin replaced with cement and iron ore tailing replaced with sand. Cube size of 150mm*150mm*150mm, cylinder of diameter 150mm and length 300mm and beams of dimensions 500mm*100mm*100mm were casted for M50 grade concrete mix and curing was done for 7,14, 28 and 56 days.

I. INTRODUCTION

In recent times the development of high strength and high-performance concretes has increased considerably because of the demands from the construction industry. In the last three decades, fly ash, silica fume and ground granulated blast furnace slag which has cementitious materials have been utilized as cement replacement materials as these can significantly increase the strength and durability characteristics of concrete with comparison of ordinary Portland cement (OPC).

(Neville 1997). Hence, high-performance and high strength concretes can be produced at lower w/b ratios by mixing these supplementary materials.

Concrete is basic common important material used in the construction industry in the past few decades, many research and modifications has been carried out to produce concrete with desired characteristics. There is always a research for concrete with higher strength and durability. The use of supplementary materials in cement is fundamental in developing low cost construction materials for use in developing countries. Concrete is the most widely used material having high compressive strength, by adding some of the pozzolanic materials, the various properties of concrete are workability, durability, strength resistance to cracks and permeability can be improved with materials. Addition of many admixtures in cement concrete which can improve the microstructures of the concrete as well as decrease the concentrations of calcium hydroxide through pozzolanic reaction.

The materials which are used for the construction of roads plays an important role including with its design. Due to the depleting natural resources and ban in sand mining in different parts of our country, replacement of these natural resources with industrial waste is being experimented in laboratory scale by various researchers. The different industrial waste reported by previous researchers are fly ash, Ground Granulated Blast Furnace Slag (GGBS), marble waste, quarry dust, glass powder, metakaolin, alccofine, etc. Similarly, various mine waste such as sandstone, limestone, coal, etc. are being replaced as fine aggregates to determine its strength properties.

OBJECTIVES

- To determine the physical properties of the river sand, crushed stone, metakaolin, iron ore tailings necessary experiments were carried out such as specific gravity and grain size distribution.
- To determine the mechanical properties of the control mix for M50 grade of concrete.
- To determine the mechanical properties of the concrete mix by considering optimum percentage of IOT as 30% constant and

ANNAMACHARYA INSTITUTE
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)



Bioethanol Production from Green Alga *Chlorococcum minutum* through Reduced Graphene Oxide-Supported Platinum-Ruthenium (Pt-Ru/RGO) Nanoparticles

D. Varaprasad¹ · P. Raghavendra² · N. Raga Sudha¹ · L. Subramanyam Sarma² · S. Nazaneen Parveen¹ · P. Sri Chandana³ · M. Subhosh Chandra⁴ · T. Chandrasekhar¹

Received: 8 November 2020 / Accepted: 16 April 2021

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2021

Abstract

Due to the continuous depletion of non-renewable fossil fuels, there is a focus on renewable energy sources such as bioethanol, biobutanol, biohydrogen and biodiesel. Microalgae have been used to yield high sugar content via alteration of the photosynthetic pathway, thereby enhancing ethanol production. Moreover, certain nanostructured composites in the medium supports biomass enhancement through modification of the photosynthetic pathway. In the present study, reduced graphene oxide-supported platinum-ruthenium (Pt-Ru/RGO) nanoparticles were synthesised, characterised and assessed the role in tris-acetate phosphate (TAP) medium for the improvement of green alga *Chlorococcum minutum* (*C. minutum*) biomass under *in vitro* conditions. Chemically, Pt-Ru/RGO nanoparticles play a useful role as a catalyst in the improvement of chemical reactions and influence the electron supply/transport system. Total chlorophyll and wet biomass contents were 8.26 mg/L and 14.0 g/L in TAP with 1.0 mg/L of nano-Pt-Ru/RGO (CM2) medium when compared with untreated cultures, but total lipid content was more (24.5 g/100 g) in TAP with 0.5 mg/L of nano-Pt-Ru/RGO (CM1) medium. Later, these nano Pt-Ru/RGO-assisted algal feedstocks were used to convert sugars into ethanol by *Saccharomyces cerevisiae* (yeast) dark fermentation. The current standardised TAP media in the presence of 0.5 or 1.0 mg/L of Pt-Ru/RGO nanoparticles (CM1 or CM2 medium) improved the ethanol production (32.6 and 31.2 g/L at 72 h respectively) from feedstocks of *C. minutum*. In conclusion, Pt-Ru/RGO nanoparticles can enhance the chemical reactions in photosynthesis likely at the electron transport system and increased the biomass in turn ethanol production.

Keywords Nano Pt-Ru/RGO · Microalgae · *C. minutum* · Biomass · Bioethanol

Introduction

The heavy use of fossil fuels for automobiles and industries is contributing to a non-renewable energy crisis. Electric vehicles on the other hand are expensive and support only short-distance travel [1]. To reduce the fuel crisis, it is important to use renewable fuels such as solar energy, wind energy and biofuels [2]. Also, the burning of fossil fuels causes greenhouse gas (GHG) emissions contributing to global warming. Biomass-based fuels are safe and reduce greenhouse gas emissions and their associated pollution [3, 4]. Most biomass-based biofuels such as bioethanol, biobutanol and biodiesel have been generated from food and oil crops, which is a threat to food security [5]. Algae are an excellent biofuel resource which might fulfill the increasing demand for energy to some extent due to their potential yield [6, 7]. Algae are primitive plants and possess a high content

✉ T. Chandrasekhar
tcsbiotech@gmail.com; tcs@yogivemanauniversity.ac.in

¹ Department of Environmental Science, Yogi Vemana University, Kadapa 516 005, A.P., India

² Department of Chemistry, Yogi Vemana University, Kadapa 516 005, A.P., India

³ Department of Civil and Environmental Engineering, Annamacharya Institute of Technology and Sciences, Kadapa 516 003, A.P., India

⁴ Department of Microbiology, Yogi Vemana University, Kadapa 516 005, A.P., India



Heuristic ant colony and reliable fuzzy QoS routing for mobile ad hoc network

C Venkata Subbaiah¹ · Govinda Kannayaram¹

Received: 20 November 2020 / Accepted: 11 March 2021

© The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2021

Abstract

The furthestmost important issues in mobile ad hoc network (MANET) are to provide a multi-path and multi-constraint qualify of service (QoS) routing for uninterrupted communication between the nodes. On one hand multi-constrained QoS routing deal with identifying paths that assure numerous autonomous QoS limitations and on the other hand, multi-path refers to the identification of multiple paths. Besides due to higher rate of topological changes and the energy constrained nodes in the network, literature survey provides us ant colony optimization (ACO), a unique variety of optimization procedure which was found to be extremely convenient for identifying reliable routing. To deal with following concerns, we suggest a multi-path multi-constraint energy-efficient routing method. In the projected method, calculate the metrics such as end to end delay and QoS monitoring agents collect, link stability, energy consumption, available bandwidth, and packet loss rate. The proposed method is called as the heuristic concurrent ACO and reliable fuzzy (HEACO–RF) QoS routing protocol for MANET. The HEACO–RF QoS routing protocol for MANET includes two phases. In the first phase, the ant colony optimization algorithm is modified to identify a deposit of candidate routes among a pair of source and destination. While identifying the candidate routes along with the QoS metrics, heuristic factors and reliable fitness functions are also considered. In the second phase, the reliability technique is used to measure each path and the paths with high reliability is selected by the ant agents using fuzzy logic based on the metrics link stability, residual energy, and packet loss rate. Simulation outcomes prove that HEACO–RF QoS routing protocol decreases the energy consumption and improves the packet delivery ratio, packet loss rate with minimum delay.

Keywords Ant colony optimization · MANET · Qualify of service (QoS) · Heuristic concurrent ACO and reliable fuzzy

1 Introduction

Mobile ad-hoc networks (MANETs) is the network with self arrangement, dynamic network nature without possessing any pre-structured infrastructure (Preeth et al. 2018). With the existence of dynamic geography and appropriated nature, multipath steering is an extraordinary worry in MANETs. Multipath directing techniques are reliable on adjoining hubs for distinguishing the briefest way that distinctive information packets are exceptionally helpless to arrange traffic (Malar et al. 2020). Mindfulness on the adjoining nodes brings about start to finish delay while broadcasting

information parcels to other contiguous nodes resulting in congestion (Ullah et al. 2019).

A novel link disjoint multipath (LDM) transmitting was investigated in Lakas et al. (2019) with the objective of solving the issues related to the optimization issue in real-time system ecosystem. The LDM method selected the shortest path from the available multiple paths in MANETs. In LDM, every intermediate node was utilized for providing a lively switch system and hence identified the best probable path. With this type of dynamic system bounds, efficient path was said to be identified within the purview of the dynamic network challenges.

With this the method was proven to be efficient by means of dependability, energy efficiency, traffic load and so on. Despite efficiency achieved in terms of energy being consumed in a reliable manner with balanced traffic load, packet loss rate and delay incurred while identifying the best probable path was not concentrated. To address this issue, in this

✉ C Venkata Subbaiah
cvenkatasubbaiah20@gmail.com

¹ SCOPE, VIT University, Vellore, TN, India

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)



High efficiency dense light field and all-in-focus compression for lossless satellite image by using CCSDS

P. Anjaneya¹ · G. K. Rajini¹

Received: 16 January 2020 / Accepted: 5 June 2020
© Springer Science+Business Media, LLC, part of Springer Nature 2020

Abstract

Light-field enables us to observe scenes from free view-points. However, it generally consists of 4-D enormous data, which are not suitable for storing or transmitting without effective compression. Image acquisition, transmission, interpretation and visualization have witnessed a lot of research interest and have manifold applications in real life. Light field Images popularly known as Plenoptic Images are light rays travelling in every direction. The data sets generated using plenoptic images are large in size and consume a lot of storage space. This paper studies the general process of image acquisition, light field images and various datasets. Image compression will help the users or professionals to not only achieve storage efficiency but also aid in transmission of Images. In this paper, we study efficient compression of multi-focus images synthesized from dense light-field by using DWT instead of DCT-based compression in order to suppress degradation such as block noise. Quality of reconstructed light-field is evaluated by PSNR for analyzing characteristics of residuals. This paper presents the modeling, design and implementation of two IP cores that are compliant with the CCSDS 121.0-B-2 and CCSDS 123.0-B-1 lossless satellite image compression standards. This paper provides a comparative study of various image compression techniques/algorithms and evaluates them on parameters like peak signal to noise ratio (PSNR), mean square error (MSE), Structural Similarity Index (SSI) and compression ratio (CR).

Keywords Plenoptic images · Image compression · Peak signal to noise ratio · Mean square error · Similarity Index · Multi-view · Multi-focus · Compression ratio-CR

1 Introduction

Digital Technology has transformed our lives for the better. Digital Image recognition devices with an increased capacity and lower cost has revolutionized Image processing. Static Cameras are being replaced by mobiles and high resolution image acquisition devices. Smaller devices with higher picture quality is the need of the hour. Plenoptic images are captured by Lytro plenoptic cameras of high resolution and better image quality. However this may result in increase in size of image as the image focusses on many components. Light-field rendering is a promising technique generating 3-D picture from multi-view picture captured by

dense camera arrays or lens arrays (Montilla et al. 2015; Ng et al. 2005). However, Light-field generally consists of 4-D enormous data that are not suitable for storing or transmitting without effective compression. The conversion enables novel light-field compression via synthesized multi-focus images as effective representation of 3-D scenes like Fig. 1 (Li et al. 2014). Multi-focus images are easily compressed because they contain mostly low frequency components. In this paper, especially, we study effective compression of multi-focus images by using DWT instead of DCT-based compression (Li et al. 2014) in order to suppress degradation such as block noise on reconstructed light-field.

New digital imaging emerges with a lot of opportunities that enhances viewing, sharing, editing, managing, and preserving images. Light field cameras have microscopic lenses. The data sets acquired by light field imaging are very huge and occupies huge space and consumes high band width. So, good compression algorithms are essential. An uncompressed light field imaging system many times occupy stored space easily exceeds Gigabytes. For storage and transmission

✉ P. Anjaneya
anjiatsk@gmail.com

G. K. Rajini
rajini.gk@vit.ac.in

¹ Vellore institute of Technology, Vellore, India

Thermal radiation and viscous dissipation effects on steady MHD heat and mass transfer flow of a micropolar fluid over an inclined isothermal permeable surface in the presence of thermophoresis

T. Sankar Reddy¹ P. Roja² P. Chandra Reddy² and M. Parvathi²

¹ Department of Mathematics, Annamacharya Institute of Technology and sciences, C. K. Dinne, Kadapa-516003, A.P., India.

² Department of Mathematics, Annamacharya Institute of Technology and sciences, Rajmpeta, Kadapa-516126, A.P., India.

Abstract: In this paper, The combined effects of thermal radiation and viscous dissipation on steady free convection Magnetohydrodynamic flow of a micropolar fluid over an inclined isothermal plate in the presence of thermophoresis is considered. The governing non linear partial differential equations of the problem are transformed into a system of nonlinear ordinary differential equations through appropriate similarity transformation and shooting technique method with Runge–Kutta Fourth order integration scheme. The effects of various physical parameters on the dimensionless velocity, microrotation, temperature, and concentration profiles are discussed and presented graphically. Finally, numerical values of the physical quantities, such as the local skin friction coefficient, the local Nusselt number and the local Sherwood number are tabulated with the variation of thermal Grashof number, modified Grashof number, magnetic parameter and coupling constant, Radiation parameter, Eckert number, thermophoretic parameter and Schmidt number parameters.

Keywords: Thermal Radiation; Viscous Dissipation; MHD; Heat and Mass Transfer; Micropolar fluid; Thermophoresis.

1. Introduction:

The theory of micropolar fluids has received enormous attentions during the recent years since the traditional Newtonian fluids cannot specifically depict the feature of fluid with suspended particles, polar fluids, suspension solutions, liquid crystals, colloidal solutions and fluid containing small additives. Physically, micropolar fluids may present the non-Newtonian fluids consisting of short rigid cylindrical elements or dumb-bell molecules, polymer fluids, fluids suspensions and animal blood. The existence of dust or smoke particular in a gas may also be modeled using micropolar fluid dynamics. Eringen [1] first derived the theory of micropolar fluids, which illustrates the microrotation effects to the microstructures. Eringen [2] extended his idea to the theory of thermomicropolar fluids, which interest to the special effects of microstructures on the fluid flow. The mathematical theory of equations of micropolar fluids and applications of these fluids in the theory of lubrication and in the theory of porous media are given in recent books by Eringen [3] and Lukaszewicz [4]. Free convection in the boundary layer flow of a micropolar fluid along a vertical wavy surface was investigated by Chiu and Chou [5]. Hassanien and Gorla [6] studied the heat transfer to a micropolar fluid from a non-isothermal stretching sheet with suction and blowing. Mixed convection boundary layer flow of a micropolar fluid on a horizontal plate was derived by Gorla [7]. Furthermore, The flow characteristics of the boundary layer of micropolar fluid over a semi-infinite plate in different situations have been studied by many authors in Refs. [8–15]. In the above mentioned works the effect of the induced magnetic field was neglected.

Convolutional recurrent neural network with template based representation for complex question answering

A. Chandra Obula Reddy, K. Madhavi

Department of Computer Science and Engineering, Jawaharlal Nehru Technological University, India

Article Info

Article history:

Received Aug 5, 2018
Revised Nov 24, 2019
Accepted Dec 8, 2019

Keywords:

Complex question answering
Convolutional recurrent neural network
Natural language processing
Question answer pair
Template

ABSTRACT

Complex Question answering system is developed to answer different types of questions accurately. Initially the question from the natural language is transformed to an internal representation which captures the semantics and intent of the question. In the proposed work, internal representation is provided with templates instead of using synonyms or keywords. Then for each internal representation, it is mapped to relevant query against the knowledge base. In present work, the Template representation based Convolutional Recurrent Neural Network (T-CRNN) is proposed for selecting answer in Complex Question Answering (CQA) framework. Recurrent neural network is used to obtain the exact correlation between answers and questions and the semantic matching among the collection of answers. Initially, the process of learning is accomplished through Convolutional Neural Network (CNN) which represents the questions and answers separately. Then the representation with fixed length is produced for each question with the help of fully connected neural network. In order to design the semantic matching between the answers, the representation of Question Answer (QA) pair is given into the Recurrent Neural Network (RNN). Finally, for the given question, the correctly correlated answers are identified with the softmax classifier.

Copyright © 2020 Institute of Advanced Engineering and Science.
All rights reserved.

Corresponding Author:

A. Chandra Obula Reddy,
Department of Computer Science and Engineering,
Jawaharlal Nehru Technological University,
Ananthapur, Ananthapuramu - 515002, A.P., India.
Email: chandrajntuanantapur@gmail.com

1. INTRODUCTION

In recent years, the task of question answering plays a major role of information retrieval in human computer interaction. The required information is described in the form of questions or statements [1]. Question Answering systems presenting an interface, where users could state their demand for information in the Natural Language format and the search engine will produce suitable answers to these questions. When compared with the traditional information retrieval system, the relevant amount of information is considered as an answer instead of retrieving the entire document [2]. Data mining is a subfield of computer science that enables intelligent extraction of useful information [3]. The user is expecting correct, comprehensible and concise answer which may indicate the sentence, image, word, paragraph, audio fragment or the whole document [4]. The problem behind this approach is converting the user information in the form of evaluation. It can be accomplished by inferencing and Semantic Web query processing approaches. The application will take advantage of this class structure to determine the semantic similarity. Street and city semantically are closer than street and time [5].

The combination of question focus and question topic is considered as a question. The topics of the question commonly have the conditions or context based on the user characteristics of interest [6]. The interest of the answer is identified by the searching topics which are entered. Several factors of question

Hierarchy based firefly optimized k-means clustering for complex question answering

A. Chandra Obula Reddy, K. Madhavi

Department of Computer Science & Engineering, Jawaharlal Nehru Technological University, India

Article Info

Article history:

Received May 1, 2019
Revised Jul 2, 2019
Accepted Jul 16, 2019

Keywords:

Clustering
Complex question answering
Firefly optimization
Query segmentation

ABSTRACT

Complex Question Answering (CQA) is commonly used for answering community questions which requires human knowledge for answering them. It is essential to find complex question answering system for avoiding the complexities behind the question answering system. In the present work, we proposed Hierarchy based Firefly Optimized k-means Clustering (HFO-KC) method for complex question answering. Initially, the given input query is preprocessed. It eliminates the way of misclassification when comparing the strings. In order to enhance the answer selection process, the obtained keywords are mapped into the candidate solutions. After mapping, the obtained keywords are segmented. Each segmentation forms a new query for answer selection and various number of answers selected for each query. Okapi-25 similarity computation is utilized for the process of document retrieval. Then the answers selected are classified with K means clustering which forms the hierarchy for each answer. Finally the firefly optimization algorithm is used for selecting the best quality of answer from the hierarchy.

Copyright © 2020 Institute of Advanced Engineering and Science.
All rights reserved.

Corresponding Author:

A. Chandra Obula Reddy,
Department of Computer Science & Engineering,
Jawaharlal Nehru Technological University,
Ananthapur, Ananthapuramu - 515002, A.P., India.
Email: chandrajntuanantapur@gmail.com

1. INTRODUCTION

Semantic information published on the web is increased rapidly with linked data initiative. However it is typically complex for the user to search and query the vast amount of structured and heterogeneous semantic data [1]. It is essential to build a system which can able to answer from different domain. It is termed as open domain question answering system which should be access the knowledge in novel way [2]. When concern about the stored data, the volume is high and it increases the burden of filtering and browsing the result for retrieving precise information. Question answering system is a technology used to find, extract, and provide a proper answer to the user's query in the natural language format [3]. The repositories are specially made for accomplishing several tasks like question answering, knowledge mining and searching [4]. Data mining is a subfield of computer science that enables intelligent extraction of useful information [5].

Due to its large and growing structure of data, efficient and intuitive techniques are essential to deal with them. The complexity and ease of interference is taken into account while processing the data [6]. Instead of knowing the query language, the knowledge graph extracts the structure and relation between the question and answer [7]. In addition with collaborative information seeking and sharing, collaborative answers are also included. The community agreements among Question Answering (QA) pairs are obtained with micro collaboration and the enhancement of collective intelligence [8]. The keywords from the query are matched with the metadata in which sequence of answers are retrieved for the given query.



Improving QOS in mobile adhoc networks routing using fuzzy inference algorithm

C. Venkata Subbaiah, K. Govinda

SCOPE, VIT University, Vellore, TN, India

ARTICLE INFO

Article history:

Received 9 November 2020

Accepted 17 November 2020

Available online xxx

Keywords:

Fuzzy
Petri nets
Frame work
Energy
QOS parameters

ABSTRACT

Mobile Ad hoc Networks (MANET) contains an enormous and moderately thick populace of versatile units that move in any region, and its solitary methods for correspondence is the utilization of remote interfaces without utilizing previous framework or brought together organization. Also, steering ought to give a methodology to sending information whenever between a couple of hubs (i.e., source and objective) over an organization. In any case, the fundamental issue is to decide an ideal steering of parcels over the organization. The fundamental goal of the proposed convention is to locate the minimum cost interest in ostensible limits that guarantees the directing of perceived amount of data packets and ensures its existence in the event of circular segment or hub disappointment. In this unique circumstance, the fuzzy coordinated Petri net is considerably embraced in the displaying of the directing and discovery/choice capacities that utilization a corresponding fuzzy change approach, wherever the proposed framework is utilized to discover an answer for the issue of vulnerability functions in specially appointed organizations. The acquired outcomes illustrate the adequacy of the proposed fuzzy inference algorithm performs well when compared to Route selection algorithm and Ant colony based Routing Algorithm. This proposed fuzzy inference algorithm is evaluated under energy consumption and sensing delay parameters. Our algorithm performs well in both the parameters and ultimately improves quality of service in mobile ad hoc networks.

© 2020 Elsevier Ltd. All rights reserved.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction

In the ongoing years, the development of remote correspondence advancements and the rise of cell phones (PCs, cell phones, and so on), made the entrance of these gadgets to the organization conceivable anyplace and whenever without interfacing the conveying gadgets to a framework as appeared in Fig. 1. A certain preferred position of these remote technologies is the capacity to be portable while remaining associated. Remote correspondence is less dependable than communication in wired organizations. The proliferation of the sign goes through bothers (e.g., move blunders, miniature break, break, and so on) because of the climate, along these lines changing the moved data. This cycle brings about an expansion in message travel time because of the increment in the number of re sending's of packets. The association can be reduced or adjusted by the versatility of locales when the client moves out of the accepting zone or moves to a elevated impedance

area. In the Mobile Ad Hoc Network (MANET), portable clients are appreciative to execute the steering of the genuine information because of the absence of framework in this kind of organization. At the point when the objective is exterior to radio scope of the resource, every versatile of the organization fills in as a transfer by re sending the information to another portable unit in anticipation of the required objective is reached. The continuous insecurity is the way because of portability and radio asset imperatives (e.g., variable throughput, restricted data transfer capacity, and so on) presents significant difficulties for this sort of steering. (See Fig. 2)

MANET is an extraordinary instance of portable organizations, and novel ideas has developed to improve the directing dependability to guarantee the nature of data in an organization consists of flexible hubs. Be that as it may, gain versatility is blemished in different viewpoints, for example, speed of correspondence and nature of administration. Contrasted with wired interfaces, a couple of remote interfaces offer quick throughput. Subsequently, steering consists of finding a way between the various components of the organization to communicate something specific between

E-mail address: cvenkatasubbaiah@gmail.com (C. Venkata Subbaiah)

<https://doi.org/10.1016/j.matpr.2020.11.567>

2214-7853/© 2020 Elsevier Ltd. All rights reserved.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering

Please cite this article as: C. Venkata Subbaiah and K. Govinda, Improving QOS in mobile adhoc networks routing using fuzzy inference algorithm, Materials Today: Proceedings, <https://doi.org/10.1016/j.matpr.2020.11.567>

PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

ENHANCED POWER CONTROL METHOD IN DC MICROGRID WITH MULTI LEVEL CONVERTERS

AFROZ SAYED¹, M.S.PRIYADARSHINI², Y.NAGARAJA³

¹PG Student, Dept of EEE, AITS, Kadapa, AP, India.

²Assistant Professor, Dept of EEE, AITS, Kadapa, AP, India.

³Assistant professor & HOD, Dept of EEE, AITS, Kadapa, AP, India.

Abstract— Multilevel converters are promising solutions in Small-Scale DC Power Network since they allow the combination of excellent harmonic performance and low switching frequencies. A high reliability can also be achieved by including redundant submodules in the chain of cascaded converters. DC microgrids have been emerging as next generation small-scale electric power networks, where the line impedance is very low. This phenomenon causes large currents in the microgrids, even for a slight change in voltage; therefore, it is critical for a power flow controller to have faster transient response and precise power flow control. In this study, multi-level converters are applied as the power flow controllers to realize high speed and high-precision power flow control in a dc microgrid. The output filter can be small, as a multi-level converter is used. This project also presents the design of the output LC filter of a multi-level converter to satisfy a requirement of current ripple. Here it is verified that a multi-level converter with a smaller filter can realize high-speed and high-precision power flow control for low line impedance conditions compared with the conventional two-level converters. The control performance of each output current is evaluated in the step response, considering the transient changes in the power flow by using MATLAB/Simulink Simulation results.

I. INTRODUCTION

Inverters are very useful for various industrial applications. In the last few years, the voltage-driving method has been adopted. To reduce the semiconductor transient voltage and current rating, a series and parallel connection method is needed. Moreover, the limited standard three-phase converter is also adopted up to the maximum allowable voltage of the load. Also, both the primary and the Pulse width modulation (PWM) switching frequency can be useful. The reduced switching frequency shows the low disappearance and the higher efficiency. In order to synthesize the spectrum signals of the harmonics caused by the capacity, the multi-level inverter has received more attention in recent times. Moreover, a multilevel inverter has a key role in providing improved operating voltage beyond the voltage limits of conventional semiconductors. For low

power photovoltaic systems, the classical two-level inverter is typically employed as the interface between dc-link and grid. However, modern wind turbines, which range from hundreds of kilowatts up to a few megawatts, demand special converter structures. One alternative is to connect switching devices in series to cope with the high voltage stress. However, this technique requires a precise method to ensure the voltage share between the devices in dynamic and static situations. Another method that has been well accepted by the industry, and is emerging as the standard solution for high power medium voltage applications, is the Multilevel Converter. These structures have the ability to synthesize the output waveform from several levels of voltages, improving the spectrum quality when compared with the classical two-level topology.

A dc microgrid helps achieve efficient power transfer by reducing the number of power conversion stages between the ac and dc sides, because most grid-tied renewable energy systems deal with dc power on both input and output sides. Line impedances are usually very low in a dc microgrid owing to the shorter distances between the nodes such as the generators, batteries, and loads compared with a large scale ac grid; thus, a large current flows through the lines even for a slight change in voltage. To suppress the excess current, a two-level converter needs a bulky output filter. A part of a grid configuration connecting only two converters and a passive resistive load has been investigated. It proposes an efficient power flow sharing and voltage regulation control method based on a hierarchical control to minimize the transmission loss of the dc micro-grids. The circuit topology used for the above studies in has been mainly the two-level converter. Moreover, an improvement of the dynamic performance has not become their main objectives. Meanwhile, there are studies aiming the realization of the high-speed response of the individual converter. In a control method to realize the fast current response in a dc-dc converter was reported. This method assumes a low voltage power supply with conversion from 5.5 V to 3.3 V and a switching frequency in MHz range to be integrated on a chip or in a package. It proposed a predictive current control for a bidirectional two-level dc-dc converter to enhance the steady-state and dynamic performances of the dc microgrid. In addition, there are studies dealing



Data Article

Quantum computational, spectroscopic and molecular docking studies of 5,5-dimethylhydantoin and its bromine and chlorine derivatives

Shaik Jaheer Basha^a, S.P. Vijaya Chamundeeswari^{b,*}

^a School of Advanced Sciences, Vellore Institute of Technology, Vellore, India
^b Center for Crystal Growth, Vellore Institute of Technology, Vellore, India

ARTICLE INFO

Article history:

Received 2 April 2020
 Revised 16 May 2020
 Accepted 12 June 2020
 Available online 16 June 2020

Keywords:

DFT
 FT-IR
 FT-RAMAN
 NLO
 Molecular docking

ABSTRACT

Quantum computational and spectroscopic studies are very much essential to study the molecular structure, functional group present, quantum level properties, and applications of organic compounds. In this research experimental spectroscopic studies like FT-Raman, FT-IR, UV-Visible, and density functional theory (DFT) approach are followed on the bromine and chlorine derivatives of 5,5-dimethylhydantoin. The experimental results of FT-IR, FT-Raman, and UV-Vis are compared with the theoretical calculations like density functional theory with the B3LYP method and 6-311++G(d,p) basis set. The optimized molecular geometry of the two derivatives is carried out compared with the experimental studies. The vibrational assignments and potential energy distribution were reported. This work also provides the non-linear optical properties. The stability and reactive nature of the compounds were calculated by natural bond orbital analysis. The bonding nature and bond energies are computed by atoms in a molecule theory. The electronic properties like HOMO- LUMO and various other chemical properties are obtained using B3LYP and also CAM-B3LYP methods with 6-311++G(d,p) basis set. By using the UV-Vis experimental studies and time-dependent theoretical studies the maximum absorption wavelength, bandgap, and transition assignments were carried out with different solvents. The reactive areas of the bromine and chlorine derivatives were obtained using molecular electrostatic potential and Fukui function studies. The ligand and protein interactions are computed by molecular docking to identify the drug activities.

© 2020 Elsevier B.V. All rights reserved.

Specification Table

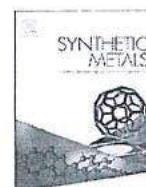
Subject area	Computational Chemistry and Spectroscopy
Compounds	bromine and chlorine derivatives of 5,5-dimethylhydantoin
Data category	Computational simulations, Molecular dynamics, spectroscopy and docking
Data acquisition format	FT-IR, FT-Raman, UV-Vis and DFT-B3LYP
Data type	Analyzed; Experimental and Theoretical
Procedure	Experimental and theoretical comparison
Data accessibility	With this article

A. Prabha
 PRINCIPAL

ANNAMACHARYA INSTITUTE OF
 TECHNOLOGY & SCIENCES
 C.K. Dinne (V&M),
 KADAPA - 516 003. (A.P.)

* Corresponding author.

E-mail address: vijaya_vit64@yahoo.co.in (S.P.V. Chamundeeswari).



Bimetallic PtCu-decorated reduced graphene oxide (RGO)-TiO₂ nanocomposite for efficient oxygen reduction reaction

B. Sravani^a, Y. Chandrashekar^a, P. Sri Chandana^b, T. Maiyalagan^c, L. Subramanyam Sarma^{a,*}

^a Nanoelectrochemistry Laboratory, Department of Chemistry, Yogi Vemana University, Kadapa, 516 005, Andhra Pradesh, India

^b Department of Civil and Environmental Engineering, Annamacharya Institute of Science & Technology, Utukuru (Post), C. K. Dinne (Mandal), Kadapa, 516 003, Andhra Pradesh, India

^c Electrochemical Energy Laboratory, Department of Chemistry, SRM Institute of Science and Technology, Kattankulathur, 603 203, Tamilnadu, India

ARTICLE INFO

Keywords:

Methanol oxidation reaction (MOR)
Oxygen reduction reaction (ORR)

ABSTRACT

To exploit the full advantages of electrocatalysts for fuel cell reactions, a promising support is essential to disperse electrocatalytically active metal nanoparticles. Here, at first a graphene oxide-titanium dioxide composite support (GO-TiO₂) is fabricated by a sol-gel method. Later, a facile chemical reduction method is demonstrated to simultaneously reduce Pt⁴⁺, Cu²⁺ and GO-TiO₂ to form bimetallic PtCu nanoparticles (15 wt% Pt + 5 wt% Cu) on a reduced graphene oxide-titanium dioxide (RGO-TiO₂) composite support. A combined action of ethylene glycol and ascorbic acid play a positive role in attaining well dispersed PtCu with a size of 7 nm particles on RGO-TiO₂ sheets. The resulting PtCu/RGO-TiO₂ nanocomposite exhibits superior electrode-area normalized ORR limiting current density (6.14 mA/cm²-geo) when compared to commercial Pt/C (3.61 mA/cm²-geo) and in-house synthesized PtCu/RGO (4.68 mA/cm²-geo) and Pt/RGO (3.95 mA/cm²-geo) catalysts. The synthesized catalysts are characterized for structural, morphological and surface elemental features by using a combination of diffraction, spectroscopy and electron microscopy techniques. The positive role played by PtCu and RGO-TiO₂ composite support assists the improved ORR activity. The versatile synthesis methodology presented here is convenient to fabricate other similar electrocatalytic nanostructures for fuel cell reactions.

1. Introduction

Increased depletion of fossil-based fuels and humanity's raising concerns towards sustainable environment put great demand on the researchers to look for eco-friendly energy resources [1,2]. Usage of hydrogen as a flexible and convenient energy carrier is considered to be the most promising substitute for fossil fuels [3]. In this regard, hydrogen-fed proton exchange membrane fuel cells (H₂-fed PEMFCs) that directly convert chemical energy of fuel into electricity without any harmful products has been presented as one of the most promising sustainable energy technologies [4]. Unfortunately, ORR kinetics is not at desirable level for the efficiency of PEMFC [5]. Platinum-based materials are widely explored as the most efficient electrocatalysts to accelerate ORR in PEMFCs [6–8]. However, the expensive price and limited source of platinum hinders its practical usage in PEMFCs. Therefore, intense efforts have been made to develop low-cost catalysts to replace Pt or to decrease the weight percentage of Pt. Alternatively, metallic non-noble catalysts have been widely developed for electrocatalytic ORR applications; however, their activity as well as the

durability is still far below than established Pt-based catalysts [9–12]. Specifically, in order to accelerate the kinetics of ORR at practical level in PEMFCs, the development of cathode catalysts cost and durability issues as well as sluggish kinetics of ORR need to be addressed. Many interesting studies have been reported towards the enhancement of ORR kinetics [13,14]. Impressively, utilization of metal oxide structures as support to disperse metal nanoparticles gained significant interest in electrocatalysis research considering the overall stability of the catalyst. In particular, nanosized TiO₂ has been utilized as a conductive support for dispersing metallic nanoparticles (Pt, Pd, Au etc.) because of their higher stability than carbon-based materials [15,16]. Although, exceptional stabilities are achieved with metal oxide-based supports, however, they generally lack required electrical conductivity, making them less preferred materials for electrocatalysis applications [17,18]. It is therefore desirable to develop a good electrocatalyst support material with required properties such as high surface area for catalyst particle dispersion, sufficient electronic conductivity to transport electron during ORR, and good electrochemical stability in acidic or alkaline conditions.

* Corresponding author.

E-mail address: sarma7@yogivemanauniversity.ac.in (L. Subramanyam Sarma).

Asorathy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

Debris collection in water using purification techniques: A review

B.V.L. Sai Srujana

Department of Computer Science and Engineering, Annamacharya Institute of Technology and Sciences, Kadapa, Andhra Pradesh, India
saisrujana333@gmail.com

B Bharagavi

Department of Computer Science and Engineering, Annamacharya Institute of Technology and Sciences, Kadapa, Andhra Pradesh, India
bharagavib201@gmail.com

B Venkatesh

Department of Mechanical Engineering, Annamacharya Institute of Technology and Sciences, Rajampet, Kadapa, Andhra Pradesh, India
bhupalam.venkatesh2005@gmail.com

ABSTRACT

In earth for living organisms' water is a significant source for surveying, and it is natural resources. Water covers most of our earth, and it is approximately 98% of water is seawater and is unusual for drinking. As clean (i.e. freshwater) water becomes rarer, a new invention offers hope, with the potential to clean up polluted waterways and make them suitable for drinking once again. To do this, we have two techniques that are implementing nowadays. These include Water cleaner robot and River water treatment plant. The Watcleaner is a robot, which floats on the surface of the water and automatically filters the oil, trash and other pollutants. It can detect the fish, dolphins, and all living organs which are in the water, making sure that none harmed during the cleaning process. Whereas the treatment plant removes microbiological, chemicals and radiological contaminants through four stages, ultra-filtration treatment, process stages include coagulation, clarification membrane filtration granular activated carbon- filtration and chlorine treatment. But by implementing Watcleaner, some disadvantages arise, i.e. the garbage is collected by the Watcleaner and sent it to disintegrators, and it stores for a long time, and it causes pollution again. To overcome the problem, nano bytes into the disintegrators and dissolve the garbage instantly. Whereas the River water treatment plant requires more space and large equipment, but it works efficiently than Watcleaner. In Watcleaner, instead of using power generators, replace them with solar panels and batteries can save power. Also, the Global Positioning System tracking systems helps to track the exact location.



PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 515 003. (A.P.)



Automated detection system for texture feature based classification on different image datasets using S-transform

O. Homa Kesav¹ · G. K. Rajini²

Received: 17 January 2020 / Accepted: 1 October 2020
© Springer Science+Business Media, LLC, part of Springer Nature 2020

Abstract

The objective of this study is to present a computer-aided diagnosis (CAD) system for automatic detection of brain tumors in brain magnetic resonance (MR) image data sets as we consider the brain image dataset from the different datasets. The proposed system initially pre-processes the input images using Fuzzy C-means (FCM) for image segmentation. Subsequently, it utilizes variant of S-transform namely discrete orthonormal S-transform (DOST) to extract the texture features and its dimensionality is reduced using Principal component analysis (PCA) and linear discriminant analysis (LDA). The reduced features are then supplied to the proposed Adaboost algorithm with Random Forest (ADBRF) classifier where the random forest is used as the base classifier for classifying the abnormal brain tumors in MRI image datasets. The simulation results based on the five runs of k-fold stratified cross-validation indicate that the proposed method yields superior accuracy (98.26%) as compared to existing schemes.

Keywords Discrete orthonormal S-transform (DOST) · Linear discriminant analysis (LDA) · Adaboost Random Forest (ADBRF)

1 Introduction

Cancer has been a great threat to mankind since last few decades. Medical Fraternity, Scientists and Researchers have not only worked on curing this menace but are focusing on early detection so that the medical fraternity and patients have enough time to counter this and nip the disease in the bud. Brain is one of the most complex organs in the human body that works with billions of cells. A brain tumor arises when there is uncontrolled division of cells forming an abnormal group of cells around or inside the brain. That group of cells can affect the normal functionality of the brain activity and destroy the healthy cells (Kavitha et al. 2016; Christ and Parvathi 2012). Brain tumors classified to benign or low-grade (grade I and II) and malignant tumors or high-grade (grade

III and IV). Benign tumors are nonprogressive (non-cancerous) so considered to be less aggressive, they originated in the brain and grows slowly; also it cannot spread to anywhere else in the body. However, malignant tumors are cancerous and grow rapidly with undefined boundaries. They can be originated in the brain itself which called primary malignant tumor or to be originated elsewhere in the body and spread to the brain which called secondary malignant tumor (Khambhata and Panchal 2016; Kaur and Rani 2016; Das and Rajan 2016). Brain magnetic resonance imaging (MRI) is one of the best imaging techniques that researchers relied on for detecting the brain tumors and modeling of the tumor progression in both the detection and the treatment phases. MRI images have a big impact in the automatic medical image analysis field for its ability to provide a lot of information about the brain structure and abnormalities within the brain tissues due to the high resolution of the images (Zacharaki et al. 2009; Litjens et al. 2017; Singh et al. 2012). In fact, Researchers presented different automated approaches for brain tumors detection and type classification using brain MRI images since it became possible to scan and load medical images to the computer. The contributions of this paper is applying the machine learning concept to computer-aided diagnosis (CAD) system for automatic

✉ O. Homa Kesav
homakesav@gmail.com

G. K. Rajini
rajini.gk@vit.ac.in

¹ School of Electronics Engineering, VIT University, Vellore, India

² School of Electrical Engineering, VIT University, Vellore, India

Published online: 11 November 2020

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 515 003. (A.P.)
Springer

Optimal distributed control of renewable energy-based microgrid – an energy management approach

Y. Nagaraja, T. Devaraju and M. Vijaykumar

Department Of Electrical Engineering, JNTU Anantapur, EEE, Anantapur, India

ABSTRACT

This article proposes an optimal control for renewable energy-based microgrid. The proposed microgrid is composed of the solar photovoltaic systems (SPV), battery energy storage system (BESS) at bus-1 which is then interconnected to another SPV with BESS system and with some intermittent loads. The power obtained from the SPV is operated with maximum power point tracking algorithm. The excess power will be delivered by the battery. The battery is operated in the bi-directional mode, i.e. charging and discharging mode depending upon the power level from SPV. The two systems are operated in a distributed control approach. The disadvantages in the centralised and decentralised control approach can be overcome by the distributed control and these sources are operated in an optimal power flow with a slide mode control. The proposed system has been executed on Matlab/Simulink platform and its results have been explored. Thus obtained results show the effectiveness of the proposed scheme.

ARTICLE HISTORY

Received 18 March 2019
Accepted 20 April 2019

KEYWORDS

Distributed control; sliding mode control; microgrid; renewable energy systems

1. Introduction

The important drawback of the existing centralised power generating stations, such as thermal power-generating units and hydel power-generating units, has a considerable effect on the environment. Furthermore, it is exhaustive in nature and non-renewable. Also, huge power loss can occur in load centres from generating stations. Hence, on-site power generation is highly appreciated. Hence, alternatives sources, such as solar photovoltaic systems, wind energy systems, fuel cell-based energy systems, etc., for conventional sources are considered to be distributed sources which are renewable in nature. With the advancement of technology, focus on distributed generation (DG) is increased instead of centralised generations (Schiffer et al. 2016). The enormously increasing energy demands can be met with the combination of centralised power-generating units and distributed energy sources such as photovoltaic arrays, wind power, fuel cells, along with energy-storing devices such as batteries and capacitors. Apart from meeting energy demand, we can reduce carbon emission with this distributed energy generation (Guo et al. 2015). Apart from its intermittent nature and large penetration of the renewable energy generation, DG faces technical problems related to its connection to other distributed networks and the main grid. Here, the concept of microgrid is introduced to address these issues.

The microgrid looks promising to meet the future demands, as it can cope up with quick dynamics in load demand, decreasing transmission losses while maintaining reliability and flexibility. The concept of microgrid is getting so much attention now as it can able to take care of the critical loads of the main grid in the event of failure of the grid along with its local loads by

utilising renewable resources. Also they can be able to operate autonomously in the event of grid failure and can supply energy to its local loads (Sadabadi, Shafiee, and Karimi 2017; Rey et al. 2017; Xin et al. 2015; Han et al. 2018; Nasirian et al. 2015; Zamora and Srivastava 2018; Li et al. 2018; Baghaee, Mirsalim, and Gharehpetian 2018; Parisio, Rikos, and Glielmo 2014; Wang et al. 2019; He et al. 2018; Pahasa and Ngamroo 2016; Ouammi, Dagdougui, and Sacile 2015). The microgrid can operate in two modes: grid-connected mode and islanded (autonomous) mode. To understand the importance of renewable energy-based DG and its integration, a basic comparison between a conventional power grid and a microgrid is presented in Table 1.

Following the standards of the consortium for electric reliability technology solutions (CERTS) architecture (Wang, Jin, and Wang 2018), (Tucci et al. 2016), a basic microgrid is an interconnection of

- (1) Distributed generating (DG) units such as photovoltaic energy, wind power and fuel cells, and microturbines.
- (2) Storage devices such as batteries, capacitors and flywheels for integration purpose,
- (3) Group of feeders for distribution and
- (4) Energy management system for managing power dispatching and set point setting to each DG unit controller.

The scheme of the microgrid is shown in Figure 1.

2. Microgrid components

Microgrid consists of microsources, i.e. distributed generating units, storage devices and interfacing components, loads which



Quantum computational, spectroscopic investigations on 6-aminobenzimidazole by DFT/TD-DFT with different solvents and molecular docking studies

Shaik Jaheer Basha^a, S.P. Vijaya Chamundeeswari^b, S. Muthu^{c,*}, BR. Raajaraman^d

^a School of Advance Sciences, VIT, Vellore, 632014, Tamil Nadu, India

^b Centre for Crystal Growth, VIT, Vellore, 632014, Tamil Nadu, India

^c Department of Physics, Arignar Anna Govt. Arts College, Cheyyar, 604 407, Tamilnadu, India

^d Department of Applied Physics, Sri Venkateswara College of Engineering, Sriperumpudur, Chennai, India



12

ARTICLE INFO

Article history:

Received 13 June 2019

Received in revised form

14 August 2019

Accepted 20 September 2019

Available online 9 October 2019

Keywords:

DFT

NBO

PCM

Docking

ABSTRACT

Quantum chemical density functional theory approach (DFT) and vibrational spectroscopy investigation were done on one of the benzimidazole derivatives called 6-Aminobenzimidazole (6ABM). The B3LYP method and 6-311++G (d,p) basis set were used to get the optimized structure, vibrational frequencies, and other various parameters. Atoms in molecules theory were employed to find the binding energies, ellipticity and isosurface projection by electron localization function. The various functional groups are identified using FT-IR, FT-Raman and NMR spectra and compared with the scaled value of simulated spectra. The donor and acceptor interactions are studied by NBO analysis. The reactive areas of the molecule are obtained by molecular electrostatic potential (MEP) and Fukui functions. By using the UV-Vis spectrum the maximum absorption wavelength was obtained and compared with TD-DFT/PCM method with different solvents. The biological studies like drug-likeness and molecular docking are carried out on the molecule.

© 2019 Elsevier B.V. All rights reserved.

1. Introduction

A heterocyclic compound is a cyclic compound and member of its rings has atoms of two different elements [1–4]. Nucleic acids, natural and synthetic dyes and the majority of drugs are heterocyclic compounds. Heterocyclic ring systems are obtained by joining with other rings of carbocyclic or heterocyclic called benzimidazole. The substituted imidazole derivatives are valuable in the treatment of many fungal infections. These derivatives easily interact with DNA and RNA. So it inhibits the growth of bacteria and fungal infections having good antifungal and antitumor activities [5–9]. The above literature studies confirm that the benzimidazole derivatives were good antifungal activities and one of the benzimidazole derivatives is 6-aminobenzimidazole (6ABM). Presently quantum chemical theory, density functional theory, molecular modeling, and vibrational spectroscopy are playing a major role in the drug research and development. Since the functions of the compounds or drugs depend on the structure,

functional group, biological and other physiochemical parameters. Literature survey shows that there were no quantum chemical and molecular modeling studies done on this molecule 6ABM. In order to understand the structure and functions of 6ABM in quantum level, a quantum mechanical concept called density functional theory followed. The optimized geometry and vibrational frequencies are compared with experimental FT-Raman, FT-IR, NMR, and UV-Vis spectra. By natural bond orbital analysis (NBO) the intermolecular interactions and the stability of 6ABM are obtained. The HOMO and LUMO calculation give the stability and hard and soft nature of the compound. By measuring the maximum absorption wavelength from 6ABM by DMSO and Methanol solvents by PCM model the electron transitions are obtained. The reactive area of the molecule is obtained qualitative by Molecular Electrostatic Potential and quantitatively by Fukui function analysis. The effect of temperature on the compound and its thermodynamic parameters entropy, enthalpy, and heat capacity are analyzed. To get the drug properties of the compound, drug-likeness and ADME studies are conducted on the 6ABM and its derivatives having antifungal properties.

* Corresponding author.

E-mail address: muthu@vit.ac.in (S. Muthu).

Analysis and design of a robust controller for a grid-connected photovoltaic power plant

Y. Nagaraja, M. Vijaya Kumar and T. Deva Raju*

Department of Electrical Engineering, JNTU, Anantapur, India

ABSTRACT

Application of renewable energy systems has a drastic impact on the present power system. In particular, solar photovoltaic power generation is expanding exponentially. Hence, in this article analysis and design of a 1 Mega Watt (1 MW) solar power plant has been modelled. The obtained power is given as an input to the voltage source converter, which contently regulates the active and reactive power by controlling the pulse width modulation signals. In this article, robust control schemes were discussed to support the required active and reactive power. Further, a detailed analysis has been presented at various fault conditions and the results are explored.

ARTICLE HISTORY

Received 24 December 2017
Accepted 8 March 2018

KEYWORDS

Solar PV system; PV system;
power control

1. Introduction

Nowadays, improvement in technology has brought about a drastic revolution in the power system. The increasing number of DGs and the deregulation are responsible for these revolutions in the power system. These improved technologies have allowed DGs to generate power as small scale micro sources which may take the eminence of inexhaustible renewable energy sources. The existence of these micro sources nearer to utility reduces the transmission cost and losses during transmission (Yang, Blaabjerg, and Zou 2013; Gutiérrez and Molina 2017b; Khan et al. 2017). According to consumers, the DGs not only satisfy the thermal and electrical requirements but also improve the local reliability and power availability by supplying power, thereby reducing voltage dips and decreasing the tariff of energy supply. As per the utility point, the erection of DGs is responsible for suppressing the demand for transmission and distribution services (Tarraso et al. 2017; Gutiérrez and Molina 2017a; Nelson, Martin, and Hurtt 2017). DGs can take on a supportive role in restoration of grids during faults. There are massive technical challenges that are associated with operation and controlling of DGs. During the time of disturbances in the network, it must establish balanced operation along with quality of power. So, an improvement in the control methodology of DGs to provide stable frequency along with constant voltage during randomly varying loads and unbalanced conditions of grid during faults is important (Meegahapola et al. 2017; Ghahderijani et al. 2017; Chou et al. 2017).

1.1. Challenges for distributed energy sources

In addition to the technical challenges, protection schemes are one among the major challenges for DGs during disturbances in the grid. The protection schemes must be such that they ensure

better control action towards providing service to the grid by supporting its demand and taking care of the DGs. During this condition the problem may arise with sensitivity and selectivity. The conclusions concerning DGs are as follows:

- It is related to a measure of installed capacities of DGs.
- Control strategies required for grid integration.

In general, because of irregular production of power and load variations, the operating parameters of the DGs may vary which results in in adjustment of the network topology (Lammert et al. 2017; Jones et al. 2016b). It leads to achieve economic and operational targets and reduces the loss. In these circumstances, the generic over current protection relay with a single group may be insufficient and also loss of relay-coordination may occur. So, it is best to draw the conclusion that the settings that are chosen for over current protection relay should be towards the grid topology and location along with type and magnitude of power generated. If not, unnecessary operation or failure may occur during necessary conditions (Diaz-Franco et al. 2016; Liu et al. 2016; Jones et al. 2016a). In grid-interfaced photovoltaic systems, the presence of VSI will provide the current controlling ability to maintain the required active and reactive power at the point of common coupling.

1.2. Classification of current control methods

- PWM current control methods
 - ON/OFF controllers
 - Hysteresis
 - Predictive optimised technique
- Current control techniques
 - Linear current control techniques
 - PI (Proportional + Integral)

CONTACT Y. Nagaraj  nagaraj.y@yahoo.com

*Present address: Department of Electrical & Electronics Engineering, SVCET, Chittoor, India.

© 2018 Informa UK Limited, trading as Taylor & Francis Group

Arshady
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

Implications and implementation of Biomedical Waste Management Rules 2016 in hospitals and a common biomedical waste treatment facility in Andhra Pradesh, India

P. Sri Chandana*

Department of Civil Engineering,
Annamacharya Institute of Technology and Sciences,
Utukur (P), C.K. Dinne (V&M),
Kadapa-516003, Andhra Pradesh, India
Email: srichandanaloka@gmail.com
*Corresponding author

P.R.K. Bhargav

Department of Thyroid, Endocrine and Metabolic Surgery,
Endocare Hospitals,
Vijayawada, Andhra Pradesh-520002, India
Email: endoanswers@gmail.com

K.B. Gayathri

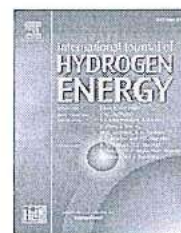
Department of Obstetrics and Gynaecology,
Dr. Pinnamaneni Siddhartha Institute of
Medical Sciences and Research Foundation,
Vijayawada, Andhra Pradesh-521286, India
Email: dr.gayathri.bhargav@gmail.com

Abstract: Biomedical waste (BMW) originated from various medical-related activities are potentially hazardous to human and animal health and poses significant threat to environment. BMW however can be rendered safe and unobjectionable, both aesthetically and environmentally if healthcare facility managers implement the appropriate requirements and recommendations of the several codes of practice and technical advice. This paper gives a brief description of the BMW Rules 2016 and the amendments thereof, the current BMW management practices in the selected health facilities in Vijayawada and a common BMW treatment facility. The case study was carried out by general survey of the facilities. It was observed that the hospitals were largely abiding to the prescribed regulations in case of collection, storage and handling the BMW. The disposal and treatment is being carried out by a proprietary firm and is in compliance with the regulatory standards.

Keywords: biomedical waste; Biomedical Waste Management Rules; treatment; disposal; regulatory standards; India.

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/hydro

Reduced graphene oxide-supported Pd@Au bimetallic nano electrocatalyst for enhanced oxygen reduction reaction in alkaline media

P. Raghavendra^a, G. Vishwakshan Reddy^a, R. Sivasubramanian^b,
P. Sri Chandana^c, L. Subramanyam Sarma^{a,*}

^a Nanoelectrochemistry Laboratory, Department of Chemistry, Yogi Vemana University, Kadapa, Andhra Pradesh, India

^b Department of Chemistry, PSG College of Technology, Peelamedu, Coimbatore, 641 004, Tamil Nadu, India

^c Annamacharya Institute of Technology & Sciences, Kadapa, Andhra Pradesh, India

ARTICLE INFO

Article history:

Received 26 April 2017

Received in revised form

7 July 2017

Accepted 24 July 2017

Available online 12 August 2017

Keywords:

Electrocatalysis

Oxygen reduction reaction

Core-shell nanoparticles

Graphene oxide support

ABSTRACT

Rational design and synthesis of core-shell bimetallic nanoparticles with tailored structural and functional properties is highly sought to realize clean and energy-efficient fuel cell systems. Herein, Pd–Au bimetallic nanoparticles (NPs) with core-shell morphology (Pd_{Core}–Au_{Shell}) were fabricated on the surface of reduced graphene oxide (RGO) support by a facile two-step protocol. In the first step, Pd_{Core}–Ag_{Shell} bimetallic NPs were synthesized on RGO support by reducing Pd²⁺ and Ag⁺ ions with methyl ammonia borane (MeAB). Later, Pd_{Core}–Au_{Shell} bimetallic NPs were conveniently fabricated on RGO support via a galvanic replacement strategy involving sacrificial oxidation of metallic silver and reduction of gold ions. The resulting core/shell bimetallic NPs were characterized by X-ray diffraction (XRD), High-resolution transmission electron microscopy (HR-TEM), Energy dispersive X-ray spectroscopy (EDS), Fourier-Transform Infrared Spectroscopy (FT-IR) and cyclic voltammetry (CV). The electrocatalytic performance of core/shell nanostructures for the room temperature oxygen reduction reaction (ORR) in alkaline media were systematically performed by CV. The electrode-area-normalized ORR activity of RGO-supported Pd_{Core}–Au_{Shell} NPs was higher than the corresponding commercially available carbon-supported Pt nanoparticles (Pt/C) at –0.8 V vs Ag/AgCl (satd. KCl) (6.24 vs 5.34 mA cm⁻², respectively). Further, methanol-tolerant ORR activities of as-synthesized catalysts were also studied. The Au-on-Pd/RGO bimetallic NPs presented enhanced ORR activity both in presence and in the absence of methanol in comparison with a commercial Pt/C catalyst and as-synthesized Pd/RGO and Au/RGO catalysts. The enhanced catalytic activities of core/shell structures might be resulted owing to the optimized core/shell structure comprising of a small Pd core and a thin Au shell and synergistic effects offered by Pd and Au. The present synthesis protocol demonstrated for two-layer structure can be extended to multi-layered structures with desired functions and activities.

© 2017 Hydrogen Energy Publications LLC. Published by Elsevier Ltd. All rights reserved.

* Corresponding author.

E-mail address: sarma7@yogivemanauniversity.ac.in (L. Subramanyam Sarma).

<http://dx.doi.org/10.1016/j.ijhydene.2017.07.199>

0360-3199/© 2017 Hydrogen Energy Publications LLC. Published by Elsevier Ltd. All rights reserved.

Ag Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

Electro, Physical & Theoretical Chemistry

Facile Fabrication of Pt-Ru Nanoparticles Immobilized on Reduced Graphene Oxide Support for the Electrooxidation of Methanol and Ethanol

P. Raghavendra,^[a] Gajulapalli Vishwakshan Reddy,^[a] Ramanathan Sivasubramanian,^[b] Panchangam Sri Chandana,^[c] and Loka Subramanyam Sarma*^[a]

This study demonstrates a convenient methodology for the decoration of Pt–Ru nanoparticles (with various morphologies like Pt-on-Ru and Ru-on-Pt) on graphene sheets. The structure, composition and morphological features of the synthesized electrocatalysts were assessed by X-ray diffraction (XRD), High-resolution transmission electron microscopy (HR-TEM), Energy dispersive X-ray spectroscopy (EDS), and cyclic voltammetry (CV). TEM analysis revealed that the Pt–Ru nanoparticles were uniformly dispersed on graphene sheets with a narrow size particle distribution. The corresponding morphology-depend-

ent activity of electrocatalysts towards two important anodic reactions relevant to fuel cell applications like methanol oxidation reaction (MOR) and ethanol oxidation reaction (EOR) were systematically studied by CV. The results showed that Pt-on-Ru/RGO electrocatalysts exhibited higher catalytic activity and better stability compared to Ru-on-Pt/RGO, Pt/RGO and commercial Pt–Ru/C catalysts towards both MOR and EOR. Furthermore, the simple synthetic strategy demonstrated here can be extended to other bimetallic systems with improved properties for fuel cell reactions.

Introduction

Hydrogen-fed proton exchange membrane fuel cells (PEMFCs) are in the forefront of fuel conversion technologies due to their potentialities in offering high power efficiencies with lower pollutant emissions.^[1] However, due to the problems associated with the storage and distribution of hydrogen, liquid fuels like methanol and ethanol have been explored as promising alternatives to hydrogen fuels.^[2] To completely realize the alcohol-fed proton exchange membrane fuel cells (direct alcohol fuel cells, denoted as DAFCs) as commercially viable electrochemical energy converters intense research efforts were focused on the development of promising electrocatalysts for both anodic alcohol (either methanol oxidation reaction, MOR; or ethanol oxidation reaction, EOR) oxidation and cathodic oxygen reduction reactions (ORR).^[3]

Pt-surface is the best known surface for the direct adsorption and dehydrogenation of both methanol and ethanol. Interesting nanostructured materials like Pt-nano-

spheres,^[4] Pt-nanocages,^[5] Pt-nanorods,^[6] Pt-dendrites etc.,^[7] were explored for electrocatalytic applications. However, CO-like species formed during the course of methanol oxidation or ethanol oxidation make Pt-alone structures impractical for real fuel cell applications. A large portion of fuel cell catalyst research is directed towards the addition of a second element along with platinum to enhance the catalyst's tolerance to CO-like species during MOR and EOR for practical fuel cell devices. Accordingly, many Pt-based bimetallics have been shown to exhibit superior activity towards oxidation of ethanol and methanol compared to Pt-alone catalysts.^[8] To further improve the viability of fuel cell devices for practical applications, dedicated research efforts have also been focused on either exploring the non-platinum catalysts or retaining the usage of platinum in lower loadings with improved Pt utilization.^[9]

The Pt-utilization in fuel cell electrocatalysts is believed to be improved by reducing the particle size of platinum^[10] or by exploring various Pt-based bimetallic structures including core–shell,^[11] textured Pt-alloys with Pt-skins on top of base metals,^[12] etc. For example, Hafeez et al have demonstrated that a hydrogen-fed fuel cell incorporating Pt particles with a size of 2.3 nm as both anode and cathode exhibit an eight-fold increased mass activity compared to a fuel cell constructed with Pt particles with a size of 3.7 nm as both anode and cathode.^[13] Further, homogeneous deposition of Pt-based nanoparticles on to a suitable conductive carbon supports like carbon black (CB), carbon nanotubes, graphene oxide were also explored as a convenient way to enhance the Pt utilization.^[14] In addition, zeolite-based materials have been utilized along with carbon supports to improve the CO oxidation efficiencies during the electrooxidation of methanol and ethanol molecules.^[15]

[a] P. Raghavendra, Dr. G. V. Reddy, Dr. L. S. Sarma
Nanoelectrochemistry Laboratory
Department of Chemistry
Yogi Vemana University
Kadapa, Andhra Pradesh, INDIA
E-mail: sarma7@yogivemanauniversity.ac.in

[b] Dr. R. Sivasubramanian
Department of Chemistry
PSG College of Technology
Coimbatore – 641 004, Tamil Nadu, INDIA

[c] Dr. P. S. Chandana
Annamacharya Institute of Technology & Sciences
Kadapa, Andhra Pradesh, INDIA

Supporting information for this article is available on the WWW under <https://doi.org/10.1002/slct.201702636>

strong control, and common and coordinated use of fiscal and economic instruments. The strong control on all levels (national, regional, municipal, and organizational) is a keystone for the successful use not only of Pigovian taxes and municipal fees, but also of other important and discussed policy instruments in household waste management.

Acknowledgements

We wish to express our gratitude to all our respondents that agreed to participate in our study and for the information, time and collaboration provided. The paper benefited also from the critical comments of Simon De Jaeger, Johan Eyckmans, Alain Verbeke, Stati Statev and Atanas Atanasov.

References

Bio IS, 2012. Use of Economic Instruments and Waste Management Performances, Report for the European Commission DG ENV. Bio Intelligence Service, Paris.

I. Bozhikin
R. Gechev

Department of Economics, University of National and World Economy,
Sofia, Bulgaria

N. Dentchev
Department of Business, Vrije Universiteit Brussel, KU Leuven,
Brussels, Belgium

Biomedical Waste Management (BMW) practices in the Pinnamaneni Siddhartha Hospital, India – A case study

In India, the Ministry of Environment and Forests published in The Gazette of India (2016), the Bio-Medical Waste Management Rules 2016.

Andhra Pradesh (A.P.) was the first State in India to have a treatment facility for the BMW coming from the Pinnamaneni Siddhartha

Hospital. The aim of this study was to focus on the analysis of its BMW management system including handling, collection, segregation, treatment and disposal. The Pinnamaneni Siddhartha (PSid) Institute of Medical Sciences and Research Foundation includes an hospital which has several specialized wards and super-specialty units, all sources of BMW with an estimated yearly quantity of 105,850 Kg.

The hospital authorities and personnel involved in BMW management were interviewed about BMW handling and management. Almost all the BMW is treated in a treatment plant situated in ChinnaKakani, in Guntur district, which serves 374 health care facilities with a total quantity of 678 kg of BMW collected, treated and disposed per day.

The collection of BMW in PSid hospital is carried out by at least two people. All the containers are labelled properly with biohazard/cytotoxic symbols and segregated according to the BMW Rules 2016 into colour coded polyethylene bags. Saline bottles are cut into two pieces to ensure no re-use in this hospital and are collected in blue colour bags. Needles are destroyed by using a needle destroyer before their disposal into the corresponding coloured bin.

The collected BMW is transported to a properly ventilated store-room situated in the hospital campus but away from the medical units for no more than 24 h. From here it is transported to the treatment/disposal facility. The treatment of BMW from PSid is carried out through on-site and off-site methods.

On-site methods are chemical disinfection of plastic wastes using chlorine solution and needles destruction. The waste is then segregated according to the suitable treatment or disposal option. BMW categories under Yellow code are treated by incineration, red code waste is treated by autoclaving, plastic and sharp wastes are shredded. The recyclable plastic is collected by Authorized Plastic Collector of Andhra Pradesh Pollution Control Board (APPCB). The ultimate disposal is landfilling into concrete pits of 20 ft. depth located nearby the treatment facility. The wastewater generated from the incineration or autoclaving is treated in an effluent treatment plant (ETP). The incinerator complies with the emission standards (Table 1).

SAFE-ENV also conducts workshops and seminars to achieve awareness and submits annual report consisting of information on collected BMW, quantities and treatment.

Table 1
BMW treatment techniques and their compliance with Rules at SAFE-ENV.

Treatment	Parameters	Operation/emission standards maintained in SAFE-ENV	Operation/emission standards as per Schedule II of BMW Rules 2016	Remarks
Incinerator	Temperature in primary chamber	800 ± 50 °C	800 ± 50 °C	In compliance
	Temperature in secondary chamber	1050 ± 50 °C	1050 ± 50 °C	In compliance
	Chimney height	30.48 m	30 m	In compliance
	Suspended particulate matter	115 mg/N m ³	50 mg/N m ³	In compliance as per BMW Rules 2011 whose standard is 150 mg/N m ³
	Nitrogen oxides	80 mg/N m ³	400 mg/N m ³	In compliance
	Sulfur oxides	80 mg/N m ³	450 mg/N m ³	In compliance
	Incinerator shell thickness	6 mm mild steel	Atleast 5 mm mild steel	In compliance
	Gravity type autoclave	Temperature	120 °C	121 °C
Residence time		60 min	Not less than 60 min	In compliance
ETP	pH	5.0-9.0	6.5-9.0	The lower pH value in the given range is higher than that maintained
	Total suspended solids	200 mg/L	100 mg/L	Two times higher value
	COD	250 mg/L	250 mg/L	In compliance
	BOD	100 mg/L	30 mg/L	High BOD
	Oil and grease	10 mg/L	10 mg/L	In compliance

PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

References

The Gazette of India, 2016. Biomedical waste (management and handling) rules, 2016. Extraordinary Part II Section 3 – subsection (ii). MoEF, GOI, India, pp. 39–63.

P. Sri Chandana

Department of Civil Engineering, Annamacharya Institute of Technology and Sciences, Kadapa, A.P., India

P.R.K. Bhargav

Department of Thyroid, Endocrine and Metabolic Surgery, Endocare Hospitals, Vijayawada, A.P., India

K.B. Gayathri

Department of Obstetrics & Gynaecology, Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation, Vijayawada, A.P., India

Waste pickers and environmental conservation

Islamabad with a population 1.83 million generates an estimated amount of 800 tons of solid waste per day. Directorate of sanitation working under the Capital Development Authority (CDA) is responsible for solid waste collection residential transportation and safe disposal within the capital territory. Only an estimated amount of 600 tons of solid waste is collected per day (Nisar et al., 2008; Mahar et al., 2006). Besides the formal collection by CDA employees, solid waste is also collected informally in the city. These scavengers collect recyclable items, from the road sides, commercial markets/areas and from the household waste. Most of the scavengers are non-native resident and come from Punjab and Khyber Pakhtunkhwa. Most of them (72%) are illiterate and some have a basic level of education. Their age ranges between 20 and 40 years but there are also some children (28%).

This research study investigated the problems faced by the waste pickers and their contribution in conservation of natural resources from the actors' perspective. It also investigated socio-economic

and health conditions of the scavengers. A survey from 190 waste pickers was conducted by using purposive sampling in order to cover the residential, commercial and rural parts of the capital city, and the data were analysed with Statistical Package for Social Scientist (SPSS).

Scavenging is an emerging informal economy that not only provides survival opportunity to the individuals but also gives chances to earn some money which, however, are not enough for living. This study reveals that the majority (43%) of the respondents were engaged in household's waste collection in the city. They segregate recyclable items and sell them. The remaining organic material is thrown into a designated container and, successively, transported to a dump site. The 87% of the respondents segregate collected items before selling to the *kabaria* or *thaikeydar* (vendor). A 39% of the respondents' segregate material during collection and 25% of the respondents segregate collected material at the selling point. The reason behind segregation is that each already segregated item has a higher value.

The 74% of the respondents were satisfied with their work. A significant majority (55%) of the scavengers was happy with his work because waste picking is an easy way to earn money without investment or skills. The 26% of the respondents who was not satisfied with the work considers collection of solid waste as a dirty work and they are not well-seen by other Pakistan people. The 96% of the respondents do not take safety measures. Some of them had injuries with infected syringes or other sharp edges materials. There is the need to provide scavengers with safety knowledge, skills and health care facilities.

References

- Mahar, A., Riffat, N.M., Qadir, A., Ahmed, T., Khan, Z., Khan, M.A., 2006. Review and analysis of current solid waste management situation in urban areas of Pakistan. In: International Conference on Sustainable Solid Waste Management <<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.529.3759&rep=rep1&type=pdf>>.
- Nisar, H., Ejaz, N., Naushad, Z., Ali, Z., 2008. Impacts of solid waste management in Pakistan: a case study of Rawalpindi city. *WIT Trans. Ecol. Environ.*, 109

M. Zaman

M. Arif

Quaid-i-Azam University, Islamabad, Pakistan

A. Reddy
 PRINCIPAL
 ANNAMACHARYA INSTITUTE OF
 TECHNOLOGY & SCIENCES
 C.K. Dinne (V&M),
 KADAPA - 516 003. (A.P.)



Cite this: DOI: 10.1039/c6qm00212a

Ultrafine Pt–Ru bimetallic nanoparticles anchored on reduced graphene oxide sheets as highly active electrocatalysts for methanol oxidation

G. Vishwakshan Reddy,^a P. Raghavendra,^a B. Ankamwar,^b P. Sri Chandana,^c S. M. Senthil Kumar^d and L. Subramanyam Sarma*^a

The controlled fabrication of bimetallic nanocatalysts with a suitable size, structure and morphology is extremely important to realize direct methanol fuel cells (DMFCs) as promising energy-generating sources. In this paper, a facile approach for depositing platinum–ruthenium (Pt–Ru) bimetallic nanoparticles on a reduced graphene oxide (RGO) support has been demonstrated. Two electrocatalysts denoted as Pt–Ru/RGO-AA and Pt–Ru/RGO-AB were synthesized by synchronously reducing H₂PtCl₆ and RuCl₃ on the graphene oxide (GO) support with reducing agents ascorbic acid and methyl ammonia borane, respectively. For comparison of methanol electrooxidation activity, monometallic Pt nanoparticles supported on RGO sheets (Pt/RGO) were also synthesized. All the catalysts were conveniently synthesized under ambient conditions without using any surfactants. The Pt/RGO, Pt–Ru/RGO-AA and Pt–Ru/RGO-AB electrocatalysts were characterized using X-ray diffraction (XRD), high-resolution transmission electron microscopy (HR-TEM), selected area electron diffraction (SAED) and energy dispersive X-ray spectroscopy (EDS). Among all the catalysts, the Pt–Ru/RGO-AB catalyst with an average particle size of 2.8 nm possessed remarkable uniformity on the RGO sheets. The electrochemical performance of RGO-supported Pt and Pt–Ru catalysts towards methanol oxidation was systematically studied using cyclic voltammetry and chronoamperometry. The results demonstrate that the Pt–Ru/RGO-AB catalyst with a high electrochemical active surface area (ECSA) of 130.46 m² g^{−1} exhibits a higher mass and ECSA normalized activities towards methanol oxidation. Furthermore, the Pt–Ru/RGO-AB catalyst has a better tolerance towards accumulated CO-like species as realized from its higher ratio of forward peak current density to reverse peak current density (*i_f/i_r*) of 3.21. The facile fabrication strategy described here is convenient and could be used for the fabrication of other multi-component nanostructured electrocatalysts for fuel cell reactions.

Received 9th September 2016,
Accepted 18th October 2016

DOI: 10.1039/c6qm00212a

rsc.li/frontiers-materials

Introduction

Direct methanol fuel cells (DMFCs) have become a subject of extensive research due to their ability to offer environmentally friendly energy conversion with a high efficiency and promising durability.^{1–3} In these electrochemical cells, methanol and water molecules are simultaneously oxidized at the anode producing CO₂, electrons and protons (known as the methanol oxidation reaction, MOR). Protons released at the anode diffuse

through the proton exchange membrane to the cathode and react with electrons and the oxidant air simultaneously and are reduced to water (known as the oxygen reduction reaction, ORR). The direct oxidation of methanol fuel simplifies the fuel-cell technology and attracts applications in various power-hungry portable devices like cellular phones, notebooks and computers. With more recent developments in this field, fuel cells are promising to provide power to automobiles and in large scale electricity-generating set-ups.⁴ The key to realize the widespread use of DMFCs for mobile and stationary applications is the use of more efficient and stable electrocatalysts which can effectively catalyze both MOR and ORR half-cell reactions. In particular, the development of sufficiently active and selective catalysts to accelerate the kinetics of MOR is a prerequisite for further progress of this technology. So far, platinum is the only metal available for the dissociative adsorption of methanol. However, methanol oxidation produces carbon monoxide and

^a Nanoelectrochemistry Laboratory, Dept. of Chemistry, Yogi Vemana University, Kadapa, Andhra Pradesh, India. E-mail: sarma7@yogivemanauniversity.ac.in

^b Bio-inspired Materials Chemistry Laboratory, Dept. of Chemistry, University of Pune, Pune, Maharashtra, India

^c Department of Civil and Environmental Engineering, Annamacharya Institute of Technology & Sciences, Kadapa, Andhra Pradesh, India

^d Electrochemical Materials Science Division, CSIR-Central Electrochemical Research Institute, Karaikudi, Tamil Nadu, India

PREPARATION OF HIGH-PURITY ULTRAFINE COPPER POWDER IN MASS-PRODUCTION BY CHEMICAL REDUCTION METHOD: TAGUCHI ROBUST DESIGN OPTIMIZATION

Yu-Hsien Peng,¹ Ching-Hwa Lee,¹ Srinivasa R. Popuri,^{2,4}
and K. N. Shashi Kumar³

UDC 621.762:669.094.2:669.015.5

The Taguchi robust design method is implemented for the optimization of experimental conditions in the synthesis of high-purity ultrafine copper powder (HUCP) in mass-production by the chemical reduction method. A reducing agent, reaction temperature, reducing agent weight, and a stirring rate are chosen as the major optimization factors and the conversion rate, particle size, and reaction time are chosen as the desired targets. It is established that the reducing agent and the reaction temperature are the most significant factors that affect the desired targets. Among the selected or designed factors, the optimal conditions for producing the HUCP are: $\text{NaH}_2\text{PO}_2 \cdot \text{H}_2\text{O}$ as the reducing agent (level 2), temperature 70°C (level 3), a reducing agent weight of 8.14 kg (level 3), and a stirring rate 300 rpm (level 2). The study results for the three desired targets are in agreement with the prediction made by the Taguchi method. Furthermore, the pure (impurity <0.06%) face-centered cubic structure of the HUCP with 1.51 μm average particle size is extensively characterized and determined by inductively coupled plasma-optical emission spectrometer (ICP-OES), laser particle-size analyzer (DLS), scanning electron microscopy (SEM), and X-ray diffraction (XRD) analysis. This surfactant-free facility method is suitable for the synthesis of high-purity ultrafine copper powder by mass-production method.

Keywords: ultrafine copper powder, chemical reduction, Taguchi design, optimization

INTRODUCTION

Ultrafine powders have been very well utilized in recent decades. Numerous ultrafine-scale materials with different properties have been synthesized from bulk materials. Specifically, a high-purity ultrafine copper powder (HUCP) is obtained from a common metal that has been under continuous investigation. The conductivity, heat transfer, and the price (lower than that of precious metals) has increased the awareness for investigation. The size-related properties of ultrafine powders influence their application in many fields, such as materials, chemistry, electronics, optics, and biology [1–4].

Copper metal powders are generally prepared by: microemulsion [5], reverse micelles [6], reduction of aqueous copper salts [7], γ -irradiation [8], UV-light irradiation [9], and polyol process [10]. The HUCP can be

¹Department of Environmental Engineering, Da-Yeh University, Dacun, Changhua, Taiwan. ²Department of Biological & Chemical Sciences, The University of the West Indies, Cave Hill Campus, St. Michael, Barbados. ³Department of Basic Sciences, Annamacharya Institute of Technology & Sciences, Utukuru, Kadapa, India.

⁴To whom correspondence should be addressed; e-mail: popurishrinu@gmail.com.

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M);
KADAPA - 516 003, (A.P.)



**ANNAMACHARYA INSTITUTE OF TECHNOLOGY &
SCIENCES**

Utukur(P), C.K.Dinne (V & M),Kadapa Dist., AP

3.5.2 Number of functional MoU's with institutions, other universities, industries, corporate houses etc. during the last five years

Summary Sheet

S.No	Academic Year	No. of. functional MoU's
1	2020-2021	6
2	2019-2020	1
3	2018-2019	1
4	2017-2018	1
5	2016-2017	3
	Total	12



INDEX

Academic year	S.No	Name of the institution/ industry/ corporate house with whom MoU is signed	Page No.s
2020-21	1	Hyderabad Institute of Electrical Engineers (HIEE) Hyderabad	1-4
	2	Shiridi Sai Electricals Limited, Kadapa	5-11
	3	Delta Steel Structures Private Limited, Kadapa	12-18
	4	Trioivision Composite Technologies Private Limited, Kadapa	19-25
	5	Chaitanya Chemicals, Kadapa	26-33
	6	Coign Consultants Private Limited, Secunderabad	34-40
2019-20	7	Valika Electronics, Hyderabad	41-44
2018-19	8	Sibar Auto parts Limited, Tirupati	45-50
2017-18	9	Sun Seas Tech, Hyderabad	51-56
2016-17	10	S.S Lab Equipments, Hyderabad	57-61
	11	Vi Microsystems Private Limited, Chennai	62-67
	12	TATA Consultancy Services Limited, Mumbai	68-97



MEMORANDUM OF UNDERSTANDING (MOU)

BETWEEN

HYDERABAD INSTITUTE OF ELECTRICAL ENGINEERS (HIEE)

AND

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES
(AITK)**

Aravamudan
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

MEMORANDUM OF UNDERSTANDING

FOR

SKILL DEVELOPMENT, CERTIFIED COURSES, OUTCOME BASED TRAININGS, PLACEMENT AND RELATED SERVICES

This Memorandum of Understanding (hereinafter called as 'MOU') is entered into on this on 15.11.2021 by and between

HYDERABAD INSTITUTE OF ELECTRICAL ENGINEERS (HIEE) 803-214/4, SRINIVAS NAGAR (WEST), AMEERPET, HYDERABAD, TELANGANA-500038. The First Party represented herein by its CEO K.MADAN MOHAN,

AICTE Internship Registration ID: CORPORATE612f1d8dadeeb1630477709,

GST Number: 36AAIFH5036P1ZX.

And

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES (AITK) the Second party represented herein by its REGISTERD:

WHEREAS:

A) First Party HIEE is engaged in the space of offering 12 weeks of Job Oriented Training Programs with certificate courses and the Internship Enabler Program with 1 month internship and Workshops opportunity to the students of engineering colleges.

B) First Party & Second Party believe that collaboration and co-operation between themselves will promote more effective use of each of their resources, and provide each of them with enhanced opportunities.

C) The Parties intent to cooperate and focus their efforts on cooperation within the area of Skill-Based Training, Expert Lecture, Education, Industrial Visit, Placement.

D) ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES (AITK) the Second Party is a Higher Educational Institution.

NOW, THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES SET FORTH IN THIS MOU, THE PARTIES HERE TO AGREE AS FOLLOWS:



A. Reddy
PRINCIPAL

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
(A.I.T.K.)

A. Reddy
PRINCIPAL

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES

1: CO-OPERATION

- 1.1 Both Parties are united by common interests and objectives, and they shall establish co-operation.
- 1.2 First Party and Second Party co-operation will facilitate effective utilization of the intellectual capabilities.
- 1.3 The parties shall co-operate with each other and shall as promptly as is responsibly practical, relevant agreement.

2: SCOPE OF THE MOU

- 2.1 Industrial Training & Visits: Industry and Institution interaction will provide an insight into the latest developments/requirements of the industries in the field of core Industries, the First Party to permit the Faculty and Students of the Second Party to visit its group companies and also involve in Industrial Training Programs for the Second Party. This will provide confidence & a smooth transition for students' work. Also, the Second party may register on the AICTE Internship Portal for the benefit of students.
- 2.2 Guest Lectures: First Party to extend the necessary support to deliver guest lecturers to the students of the Second Party on the technology trends and in-house requirements.
- 2.3 Certificate Courses: the First party will actively engage to help the delivery of certificate courses in the field of Electrical Industries based on the industry-leading platforms to the students of the Second party.
- 2.4 Internship for students: the First party will actively engage to help the delivery of the training and internship of the students of the Second party on the technology trends and in-house requirements.
- 2.5 There is no financial commitment on the part of HIEE and AITK take up any program mentioned in MOU. Financial for any programs, revised on case to case basis.
- 2.6 Both Parties to obtain all internal approvals, consents, permissions, and licenses of whatsoever nature required either individually or collectively,

3: VALIDITY

- 3.1 The term of this MOU is for a period of 3 years, effective from the date of MOU signed. This MOU can be extended upon written mutual agreement. It shall be reviewed annually to ensure that it is fulfilling its purpose and to make any necessary revisions.
- 3.2 Either organization may terminate this MOU upon thirty(30) days written notice without penalties or liabilities.

Malan Soud. K.



AS Reddy

PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

AS Reddy

PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

4: RELATIONSHIP BETWEEN THE PARTIES

4.1 It is expressly agreed that First Party and Second Party are acting under this MOU as independent contractors, and the relationship established under this MOU shall not be construed as a partnership.

First Party

Kalan Soudh



Second Party

Asladdy

PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (VBM),
KADAPA - 516 003. (A.P.)

Date: 15.11.2021

Asladdy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (VBM),
KADAPA - 516 003. (A.P.)

Memorandum of Understanding

Between

Annamacharya Institute of Technology and
Sciences

Utukur (P), C.K.Dinne (V&M), Kadapa



&



Shirdi Sai Electricals Ltd., Kadapa

for

**Skill Development, Education, Training, Placement,
Research Services and Related Services**

September 2021

Aravind
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
516 003. (A.P.)

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called as the 'MoU') is entered in on this the 15th day of Sep-2021 (DD/MM/YYYY),
By and Between

Annamacharya Institute of Technology & Sciences, Utukur(P), C.K. Dinne (V&YSR Kadapa Dt., Andhra Pradesh, 516003, (hereinafter referred to as 'AI Kadapa') the First Party represented herein by its **Principal**, (the institution whose expression, unless excluded by or repugnant to the subject or context shall include successors - in-office, administrators and assigns).

And

Shirdi Sai Electricals Ltd., Plot No. 51 to 55 & 58 to 60, Industrial Development Park, Kadapa, Andhra Pradesh, 516002, (hereinafter referred to as 'SSE') the Second Party, and represented herein by its Plant Head, **Mr. N. Sudhakar Reddy** (company whose expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

(**AIKS Kadapa and SSE** are hereinafter jointly referred to as 'Parties' and individually as 'Party')

WHEREAS:

A) **AIKS Kadapa** is a Higher Educational Institution named:

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES , Kadapa

- (i) **AIKS Kadapa** is engaging in education and research at UG and PG level and offering various courses of engineering.
- (ii) **AIKS Kadapa** is operating under the flagship of Annamacharya Educational Trust.

B) **SSE, the Second Party** is engaged in Skill Development, Education and R&D Services in the fields of - Innovative Manufacturing Process and Maintenance Services, and educational support services.

C) **SSE, the Second Party** is promoted by **Mr.N.Sudhakar Reddy, Shirdi Sai Electricals Ltd., Plot No. 51 to 55 & 58 to 60, Industrial Development Park Kadapa, Andhra Pradesh, 516002**

- (i) **Shri Shirdi Sai Electricals Ltd., Kadapa** represented by **Mr. N. Sudhakar Reddy** Plant Head is established in 1994 with a vision to cater the emerging

needs of energy sector, SSE is one of the leading manufacturers of and Distribution Transformers ranging from 5 kVA to 50 MVA up to 1 class. SSE has erected over 100 substations & 80,000 Kms of LT & HT. The main objective of SSE is to meet the customer expectations in generation, supply and distribution segments of power sector, SSE focuses on Innovative manufacturing process and constantly upgrade to Indigenous designs in the manufacturing of Transformers, with backward integrated & automated manufacturing facility.

- (ii) SSE is operational with its head office at Hyderabad, India. SSE has ISO9001:2015, EMS 14001:2015 Certifications in design, supply & supply of Power & Distribution Transformers with an annual capacity to manufacture more than 100,000 transformers. The transformer test facility at SSE is NABL accredited to test lab - ISO 17025:2017. All transformers manufactured by SSE are being certified by BIS & BEE.
- D) AITS Kadapa & SSE believe that collaboration and co-operation between themselves will promote more effective use of each of their resources, & provide each of them with enhanced opportunities.
- E) The Parties intend to cooperate and focus their efforts on cooperation with area of Skill Based Training, Education and Research and any other areas upon mutual consent.
- F) Both Parties, being legal entities in themselves desire to sign this MOU advancing their mutual interest.

NOW THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES SET FORTH IN THIS MoU, THE PARTIES HERE TO AGREE AS FOLLOWS:

CLAUSE 1: CO-OPERATION

- 1.1 Both Parties are united by common interests and objectives, and they establish channels of communication and co-operation that will promote and advance their respective operations within the Institution and its related areas. The Parties shall keep each other informed of potential opportunities and share all information that may be relevant to secure additional opportunities for one another.
- 1.2 AITS Kadapa and SSE co-operation will facilitate effective utilization of the intellectual capabilities of the faculty of AITS Kadapa providing significant support to them in developing suitable teaching/training and research systems, keeping in mind the needs of the industry.

Principal
AITS Institute of
Kadapa

- 1.3 The general terms of co-operation shall be governed by this MoU. The Parties cooperate with each other and shall, as promptly as reasonably practical, enter into all relevant agreements, deeds and documents (the 'Definitive Documents') may be required to give effect to the actions contemplated in terms of this MoU. The term of Definitive Documents shall be mutually decided between the Parties. Along with the Definitive Documents, this MoU shall represent the Parties' understanding as to the subject matter hereof and shall supersede any other understanding between the Parties on the subject matter hereof.

CLAUSE 2: SCOPE OF THE MoU

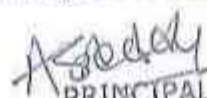
- 2.1 Both parties believe that close co-operation between the two would be of benefit to the student community to enhance their skills and knowledge. The following areas are covered under this MoU for engagement and cooperation to the benefit of the student community:
- Curriculum Design
 - Industrial Training and Visits
 - Internships and Placement of Students
 - Research and Development
 - Skill Development Programs
 - Guest Lectures and
 - Faculty Development Programs
- 2.2 **Curriculum Design:** SSE will give valuable inputs to AITS Kadapa regarding teaching/training methodology and suitably customize the curriculum so that students fit into the industrial scenario meaningfully.
- 2.3 **Industrial Training & Visits:** Industry and Institution interaction will give insight into the latest developments/requirements of the industries; SSE will arrange for the Faculty and Students of AITS Kadapa to visit its associated companies and also involve in Industrial Training Programs for AITS Kadapa. The industrial training and exposure provided to students and faculty through this association will build confidence and prepare the students to have a smooth transition from academic to working career. SSE will provide Labs/Workshops/Industrial Sites for the hands-on training of the students enrolled with AITS Kadapa.
- 2.4 **Internships and Placement of Students:** SSE will actively engage to the delivery of the internship and placement of students of AITS Kadapa. SSE will provide internships/jobs, as per AICTE internship Policy. SSE will also register its
- PRINCIPAL
INSTITUTE OF


AICTE Internship Policy Portal for disseminating the Internship opportunities available with them.

- 2.5 **Research and Development:** Both Parties have agreed to carry out the research activities in the fields of Skill Development, Education and R&D Services in the fields of – Innovative Manufacturing process and Maintenance Services
- 2.6 **Skill Development Programs:** SSE to engage in training the students of Kadapa on the emerging technologies in order to bridge the skill gap and them industry ready.
- 2.7 **Guest Lectures:** SSE to extend the necessary support to deliver guest lectures to the students of AITS Kadapa on the technology trends and in-house requirements.
- 2.8 **Faculty Development Programs:** SSE will train the Faculties of AITS Kadapa imparting industrial exposure/training and in knowledge and skill upgrade per the industrial requirements.
- 2.9 Both Parties to obtain all internal approvals, consents, permissions, and licenses of whatever nature required for offering the Programs on the terms specified herein
- 2.10 There is no financial commitment on the part of the AITS Kadapa, the First Party. It will take up any program mentioned in the MoU. If there is any financial consideration it will be dealt separately and upon mutual consent.

CLAUSE 3: INTELLECTUAL PROPERTY

- 3.1 Nothing contained in this MoU shall, by express grant, implication, Estoppel or otherwise, create in either Party any right, title, interest, or license in or to any intellectual property (including but not limited to know-how, inventions, patents, copyrights and designs) of the other Party.
- 3.2 Each Party agrees and acknowledges that all the copyrights, trademarks, trade secrets and/or licensed software, service marks and trade secrets of either Party while conducting the business contemplated under this MoU shall remain the property and belong to such respective Party.
- 3.3 Protect the confidential information and IPRs in a reasonable and appropriate manner as prescribed under law and in accordance with applicable professional standards.


PRINCIPAL
ANNAMACHARYA INSTITUTE OF


PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES



- 3.4 Use confidential information and IPRs only to perform obligation under arrangement; and reproduce confidential information and IPRs only as required to perform its obligations under this arrangement.
- 3.5 This clause shall survive and continue even after the termination of the MoU.

CLAUSE 4: VALIDITY

4. This MoU is valid for a period of three years and can be extended further with mutual approval and agreement

CLAUSE 5: RELATIONSHIP BETWEEN THE PARTIES

- 5.1 It is expressly agreed that AITS Kadapa and SSE are acting under this MoU as independent contractors, and the relationship established under this MoU shall not be construed as a partnership. Neither Party is authorized to use the other Party's name in any way, to make any representations or create any obligation or liability, expressed or implied, on behalf of the other Party, without the written consent of the other Party. Neither Party shall have, nor represent it having, any authority under the terms of this MoU to make agreements of any kind in the name of or binding upon the other Party, to pledge the other Party's assets or to extend credit on behalf of the other Party.

Annamacharya Institute of Technology
& Sciences, Kadapa



Any divergence or difference derived from the interpretation or application of the MoU shall be resolved by arbitration between the parties as per the Arbitration Act, 1996. The place of the arbitration shall be at District Headquarters of AITS Kadapa. This undertaking is to be construed in accordance with Indian Law with exclusive jurisdiction in the Courts of Kadapa.

A. Sreedhar
PRINCIPAL
ANNAMACHARYA INSTITUTE
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

A. Sreedhar
ANNAMACHARYA INSTITUTE
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)



AGREED:

For Annamacharya Institute of
Technology & Sciences
Kadapa

AS Reddy
PRINCIPAL

Authorized Signatory
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

For Shirdi Sai Electricals Ltd.,



Authorized Signatory

Annamacharya Institute of Technology & Sciences	Shirdi Sai Electricals Ltd.,
Utukur (P), C.K. Dinne (V & M), YSR Kadapa District, A.P. 516 003	Plot No. 51 to 55 & 58 to 60, Industrial Development Park, Kadapa, A.P. 516 002
9603999591	9948081850
aitskadapa@gmail.com	sudhakarnarreddy@ssel.in
www.aitskadapa.ac.in	www.ssel.in

Witness1:

[Signature]

Witness1:

[Signature]

Witness2:

[Signature]

Witness2:

[Signature]

AS Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

Memorandum of Understanding

Between

Annamacharya Institute of Technology and Sciences

Utukur (P), C.K.Dinne (V&M), Kadapa



&



**Delta Steel Structures Pvt. Ltd.,
Kadapa**

for

**Skill Development, Education, Training, Placement,
Research Services and Related Services**

September 2021

Aravali
PRINCIPAL
ANNAMACHARYA INSTITU
TECHNOLOGY & SCIEN
C.K. Dinne (V&M),
003. (F

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called as the 'MoU') is entered into on this the 14 day of 09 - 2021 (DD/MM/YYYY),

By and Between

Annamacharya Institute of Technology & Sciences, Utukur(P), C.K. Dinne (V&YSR Kadapa Dt., Andhra Pradesh, 516003, (hereinafter referred to as 'A Kadapa') the First Party represented herein by its **Principal**, (the institution whose expression, unless excluded by or repugnant to the subject or context shall include successors - in-office, administrators and assigns).

And

Delta Steel Structures Pvt. Ltd., Near Krishnapuram Railway Station, Tadigotla (V), C.K.Dinne (M), Kadapa, A.P. - 516003, (hereinafter referred to as 'Delta') the Second Party, and represented herein by its Office Manager, **Mr. A. Ravi Narasimhulu**, (company whose expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns)

(AITS Kadapa and Delta are hereinafter jointly referred to as 'Parties' and individually as 'Party')

WHEREAS:

A) AITS Kadapa is a Higher Educational Institution named:

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES, Kadapa

- (i) AITS Kadapa is engaging in education and research at UG and PG level and offering various courses of engineering.
- (ii) AITS Kadapa is operating under the flagship of Annamacharya Educational Trust.

B) **Delta**, the Second Party is engaged in Skill Development, Education and R&D Services in the fields of - Heavy Structural Fabrication and educational support services.

- (i) **Delta**, the Second Party is promoted by **Mr. A. Ravi Narasimhulu, Delta Steel Structures Pvt. Ltd., Near Krishnapuram Railway Station, Tadigotla (V), C.K.Dinne (M), Kadapa, A.P. - 516003**

Delta Steel Structures Pvt. Ltd., Kadapa represented by **Mr. A. Ravi Narasimhulu**, Office Manager is established in 2007, with a vision to meet the emerging needs of premium quality structural steel fabrication services.

Delta Steel Structures is a leading manufacturer of Pre-Engineered Buildings in India, which design, fabricate and deliver world class buildings on time and on budget. It defines quality and is committed to excellence. Delta design and fabrication quality management system is certified to the ISO 9001 standard. It provides a comprehensive service right from a project briefing to the final on-site installation.

- (ii) Delta is constantly innovating and is excited about creating custom buildings for their clients. It keeps its projects economical and competitive. It has a team of engineers and designers who are highly enthusiastic and excel in what they do. Most importantly they have an attitude of being ahead of schedules with an uncompromised standard of safety.
- C) AITS Kadapa & Delta believe that collaboration and co-operation between themselves will promote more effective use of each of their resources, and provide each of them with enhanced opportunities.
- D) The Parties intent to cooperate and focus their efforts on cooperation with an area of Skill Based Training, Education and Research and any other areas upon mutual consent.
- E) Both Parties, being legal entities in themselves desire to sign this MOU advancing their mutual interest.

NOW THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES SET FORTH IN THIS MOU, THE PARTIES HERE TO AGREE AS FOLLOWS:

CLAUSE 1: CO-OPERATION

- 1.1 Both Parties are united by common interests and objectives, and they establish channels of communication and co-operation that will promote and advance their respective operations within the Institution and its related activities. The Parties shall keep each other informed of potential opportunities and share all information that may be relevant to secure additional opportunities for one another.
- 1.2 AITS Kadapa and Delta co-operation will facilitate effective utilization of the intellectual capabilities of the faculty of AITS Kadapa providing significant input to them in developing suitable teaching/training and research systems, keeping in mind the needs of the industry.

A. K. Reddy
PRINCIPAL

A. K. Reddy
PRINCIPAL

A. K. Reddy
PRINCIPAL

ACHARYA INSTITUTE OF
TECHNOLOGY

GSTIN: 37AACCD7593A22N

- 1.3 The general terms of co-operation shall be governed by this MoU. The Parties cooperate with each other and shall, as promptly as reasonably practical, enter into all relevant agreements, deeds and documents (the 'Definitive Documents') which may be required to give effect to the actions contemplated in terms of this MoU. The terms of Definitive Documents shall be mutually decided between the Parties. Along with the Definitive Documents, this MoU shall represent the understanding as to the subject matter hereof and shall supersede any understanding between the Parties on the subject matter hereof.

CLAUSE 2: SCOPE OF THE MoU

- 2.1 Both parties believe that close co-operation between the two would be of benefit to the student community to enhance their skills and knowledge. The following areas are covered under this MoU for engagement and cooperation to the benefit of the student community:
- a. Curriculum Design
 - b. Industrial Training and Visits
 - c. Internships and Placement of Students
 - d. Research and Development
 - e. Skill Development Programs
 - f. Guest Lectures and
 - g. Faculty Development Programs
- 2.2 **Curriculum Design:** Delta will give valuable inputs to AITS Kadapa teaching/training methodology and suitably customize the curriculum so that the students fit into the industrial scenario meaningfully.
- 2.3 **Industrial Training & Visits:** Industry and Institution interaction will give insight into the latest developments/requirements of the industries; Delta will arrange for the Faculty and Students of AITS Kadapa to visit its associated companies and also involve in Industrial Training Programs for AITS Kadapa. The industrial training and exposure provided to students and faculty through this association will build confidence and prepare the students to have a smooth transition from academic to working career. Delta will provide Labs/Workshops/Industrial Sites for the hands-on training of the learners enrolled with AITS Kadapa.
- 2.4 **Internships and Placement of Students:** Delta will actively engage to help in the delivery of the internship and placement of students of AITS Kadapa. Delta will also register its internships/jobs, as per AICTE Internship Policy. Delta will also register itse
- Principal

AICTE Internship Policy Portal for disseminating the Internship opportunities available with them.

- 2.5 **Research and Development:** Both Parties have agreed to carry out the research activities in the fields of Skill Development, Education and R&D Services in the fields of – Innovative Manufacturing process and Maintenance Services.
- 2.6 **Skill Development Programs:** Delta to engage in training the students of AITS Kadapa on the emerging technologies in order to bridge the skill gap and make them industry ready.
- 2.7 **Guest Lectures:** Delta to extend the necessary support to deliver guest lectures to the students of AITS Kadapa on the technology trends and in-house requirements.
- 2.8 **Faculty Development Programs:** Delta will train the Faculties of AITS Kadapa imparting industrial exposure/training and in knowledge and skill upgrade as per the industrial requirements.
- 2.9 Both Parties to obtain all internal approvals, consents, permissions, and licenses of what so ever nature required for offering the Programs on the terms specified herein.
- 2.10 There is no financial commitment on the part of the AITS Kadapa, the First Party. It will take up any program mentioned in the MoU. If there is any financial consideration involved, it will be dealt separately and upon mutual consent.

CLAUSE 3: INTELLECTUAL PROPERTY

- 3.1 Nothing contained in this MoU shall, by express grant, implication, Estoppel or otherwise, create in either Party any right, title, interest, or license in or to any Intellectual property (including but not limited to know-how, inventions, patents, copyrights and designs) of the other Party.
- 3.2 Each Party agrees and acknowledges that all the copyrights, trademarks, trade secrets and/or licensed software, service marks and trade secrets of either Party while conducting the business contemplated under this MoU shall always belong to such respective Party.
- 3.3 Protect the confidential information and IPRs in a reasonable and appropriate manner as prescribed under law and in accordance with applicable professional standards.

A. Praveen
PRINCIPAL
ANNAMACHARYA INSTITUTE OF TECHNOLOGY
A. Praveen
PRINCIPAL
DELTA STEEL STRUCTURES PVT. LTD.,
GSTIN: 37AACCD7593A22N
Bullong, Chikita

- 3.4 Use confidential information and IPRs only to perform obligation under arrangement; and reproduce confidential information and IPRs only as required to perform its obligations under this arrangement.
- 3.5 This clause shall survive and continue even after the termination of the MoU.

CLAUSE 4: VALIDITY

4. This MoU is valid for a period of three years and can be extended further by mutual approval and agreement

CLAUSE 5: RELATIONSHIP BETWEEN THE PARTIES

- 5.1 It is expressly agreed that AITS Kadapa and Delta are acting under this MoU as independent contractors, and the relationship established under this MoU shall not be construed as a partnership. Neither Party is authorized to use the other Party's name in any way, to make any representations or create any obligations or liability, expressed or implied, on behalf of the other Party, without the written consent of the other Party. Neither Party shall have, nor represent it having, any authority under the terms of this MoU to make agreements of any kind in the name of or binding upon the other Party, to pledge the other Party's assets or to extend credit on behalf of the other Party.

**Annamacharya Institute of Technology
& Sciences, Kadapa**

**Delta Steel Structures Pvt.
Kadapa**

Any divergence or difference derived from the interpretation or application of the MoU shall be resolved by arbitration between the parties as per the Arbitration Act, 1996. The place of the arbitration shall be at District Headquarters of AITS Kadapa. This undertaking is to be construed in accordance with Indian Law with exclusive jurisdiction in the Courts of Kadapa.

A. Sreedhar
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

A. Sreedhar
PRINCIPAL
DELTA STEEL STRUCTURES PVT. LTD.,
Near Krishnapuram Railway Station,
Tadigotla (V), C.K. Dinne (M),
KADAPA - 516 005.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES
GSTIN: 07AACCD7593A229

AGREED:

For Annamacharya Institute of
Technology & Sciences
Kadapa

A. Ravula

PRINCIPAL

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

For Delta Steel Structures Pvt. Lt
Kadapa

A. Ravula

GSTIN: 37AACCD7593A2ZN
DELTA STEEL STRUCTURES PVT. LTD.

Near Krishnapuram Railway Station,
Tadigouda (V), C.K. Dinne (M),
KADAPA - 516 005.

Annamacharya Institute of Technology & Sciences	Delta Steel Structures Pvt. Ltd.,
Utukur (P), C.K. Dinne (V & M), YSR Kadapa District, A.P. 516 003	Near Krishnapuram Railway Station, Tadig village, C.K. Dinne Mandal, Kadapa, A.P. 51
9603999591	9052067864
aitskadapa@gmail.com	ravi.avula@deltasteel.in
www.aitskadapa.ac.in	www.deltasteel.in

Witness1:

[Signature]

Witness1:

[Signature]

Witness2:

[Signature]

Witness2:

[Signature]

A. Ravula
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

MEMORANDUM OF UNDERSTANDING

Between

**Annamacharya Institute of Technology and Sciences
Utukur (P), C.K.Dine (V&M), Kadapa**



&



TrioVision Composite Technologies Pvt Ltd., Kadapa

FOR

**SKILL DEVELOPMENT, EDUCATION, TRAINING, PLACEMENT,
RESEARCH SERVICES AND RELATED SERVICES**

SEPTEMBER 2021

Arreeddy
PRINCIPAL
ANNAMACHARYA INSTITU
TECHNOLOGY & SCIEN
(V&M),

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called as the 'MoU') is entered into on this the 14 day of Sep - 2021 14/09/2021 (DD/MM/YYYY),

By and Between

Annamacharya Institute of Technology & Sciences, Utukur(P), C.K. Dinne (V&M), YSR Kadapa Dt., Andhra Pradesh, 516003, (hereinafter referred to as 'AITS Kadapa') the **First Party** represented herein by its **Principal**, (the institution which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

And

Trivision Composite Technologies Pvt Ltd, mega Industrial Park, Plot No. 176, Kopparthi, Ambavaram, Andhra Pradesh 516293 (hereinafter referred to as 'TCT') the **Second Party**, and represented herein by its Managing Director, **Mr. M.V.B.S Nandan Reddy**, (company which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

(AITS Kadapa and TCT are hereinafter jointly referred to as 'Parties' and individually as 'Party')

WHEREAS:

A) AITS Kadapa is a Higher Educational Institution named:

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES, Kadapa

- (i) AITS Kadapa is engaging in education and research at UG and PG levels and offering engineering, and computer application programs.
- (ii) AITS Kadapa is operating under the flagship of Annamacharya Educational Trust.

B) TCT, the Second Party is engaged in Skill Development, Education and R&D Services in the fields of - Innovative Manufacturing Process and Maintenance Services, and educational support services.

C) TCT, the Second Party is promoted by **Mr. M.V.B.S Nandan Reddy, Trivision Composite Technologies Pvt Ltd, mega Industrial Park, Plot No. 176, Kopparthi, Ambavaram, Andhra Pradesh 516293**.

- (i) TrioVision has been established in 2015 with a great vision of "THREE" individuals to address the growing needs of Composites in India as well as Global Market. The operations started with Engineering and Tooling support in India where it has executed several projects starting from a small robotic cover of 0.5 square meter to huge nacelle covers of upto 100 square meter. It is established to address growing needs of advanced composite technologies for Indian and Global Markets. TCT is a manufacturer of engineered composite tooling and fiber glass products.
- (ii) TCT is a manufacturer of engineered composite tooling and fiber glass products. It is one of its kind located in Kopparthi Mega Industrial Park of Kadapa city which is South Central part of Andhra Pradesh state which will provide engineering, tooling & manufacturing solutions for composites using advanced technologies under one roof.
- (iii) It has eventually stepped into manufacturing in 2018 and executed projects in various segments. It is the first Indian company using Advanced Robotic Machining Technologies in composites industry.
- (iv) The three principles which has been stepping stones for TrioVision's success has been Quality, Delivery and Safety. It is one of the three ZED certified supplier in Andhra Pradesh and also certified by ISO 9001:2015 by QMS.
- D) AITS Kadapa & TCT believe that collaboration and co-operation between themselves will promote more effective use of each of their resources, and provide each of them with enhanced opportunities.
- E) The Parties intent to cooperate and focus their efforts on cooperation within area of Skill Based Training, Education and Research and any other areas upon mutual consent.
- F) Both Parties, being legal entities in themselves desire to sign this MOU for advancing their mutual interest.

NOW THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES SET FORTH THIS MoU, THE PARTIES HERE TO AGREE AS FOLLOWS:

A. Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES

A. Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
2019



CLAUSE 1: CO-OPERATION

- 1.1 Both Parties are united by common interests and objectives, and they shall establish channels of communication and co-operation that will promote and advance their respective operations within the Institution and its relatives. The Parties shall keep each other informed of potential opportunities and shall share all information that may be relevant to secure additional opportunities for one another.
- 1.2 AITS Kadapa and TCT co-operation will facilitate effective utilization of the intellectual capabilities of the faculty of AITS Kadapa providing significant inputs to them in developing suitable teaching/training and research systems keeping in mind the needs of the industry.
- 1.3 The general terms of co-operation shall be governed by this MoU. The Parties shall cooperate with each other and shall, as promptly as reasonably practicable, enter into all relevant agreements, deeds and documents (the 'Definitive Documents') as may be required to give effect to the actions contemplated under the terms of this MoU. The terms of Definitive Documents shall be mutually decided between the Parties. Along with the Definitive Documents, this MoU shall represent the entire understanding as to the subject matter hereof and shall supersede any prior understanding between the Parties on the subject matter hereof.

CLAUSE 2: SCOPE OF THE MoU

- 2.1 Both parties believe that close co-operation between the two would be a major benefit to the student community to enhance their skills and knowledge. The following areas are covered under this MoU for engagement and cooperation for the benefit of the student community:
 - a. Curriculum Design
 - b. Industrial Training and Visits
 - c. Internships and Placement of Students
 - d. Research and Development
 - e. Skill Development Programs
 - f. Guest Lectures and
 - g. Faculty Development Programs

A. D. Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
SCIENCES

A. D. Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY AND SCIENCES
C.K. Dindimani
KADAPA - 515103. (A.P.)

- 2.2 **Curriculum Design:** TCT will give valuable inputs to AITS Kadapa teaching/training methodology and suitably customize the curriculum so that the students fit into the industrial scenario meaningfully.
- 2.3 **Industrial Training & Visits:** Industry and Institution interaction will give insight into the latest developments/requirements of the industries; TCT shall arrange for the Faculty and Students of AITS Kadapa to visit its associated companies and also involve in Industrial Training Programs for AITS Kadapa. The industrial training and exposure provided to students and faculty through this association will build confidence and prepare the students to have a smooth transition from academic to working career. TCT will provide its Labs/Workshops/Industrial Sites for the hands-on training of the learners enrolled with AITS Kadapa.
- 2.4 **Internships and Placement of Students:** TCT will actively engage to help in the delivery of the internship and placement of students of AITS Kadapa in internships/jobs, as per AICTE internship Policy. TCT will also register its details on AICTE Internship Policy Portal for disseminating the Internship opportunities available with them.
- 2.5 **Research and Development:** Both Parties have agreed to carry out the joint research activities in the fields of Skill Development, Education and R&D Services in the fields of – Innovative Manufacturing process and Maintenance Services.
- 2.6 **Skill Development Programs:** TCT to engage in training the students of AITS Kadapa on the emerging technologies in order to bridge the skill gap and make them industry ready.
- 2.7 **Guest Lectures:** TCT to extend the necessary support to deliver guest lectures to the students of AITS Kadapa on the technology trends and industry house requirements.
- 2.8 **Faculty Development Programs:** TCT to train the Faculties of AITS Kadapa for imparting industrial exposure/training and in knowledge and skill upgradation as per the industrial requirements.
- 2.9 Both Parties to obtain all internal approvals, consents, permissions, and licenses of what so ever nature required for offering the Programs on the terms specified herein

Aslady
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES

Aslady
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES



- 2.10 There is no financial commitment on the part of the AITS Kadapa, the Fin Party to take up any program mentioned in the MoU. If there is any financial consideration, it will be dealt separately and upon mutual consent.

CLAUSE 3: INTELLECTUAL PROPERTY

- 3.1 Nothing contained in this MoU shall, by express grant, implication, Estoppel or otherwise, create in either Party any right, title, interest, or license in or the intellectual property (including but not limited to know-how, inventions, patents, copy rights and designs) of the other Party.
- 3.2 Each Party agrees and acknowledges that all the copyrights, trademarks, proprietary and/or licensed software, service marks and trade secrets of each Party while conducting the business contemplated under this MoU shall always belong to such respective Party.
- 3.3 Protect the confidential information and IPRs in a reasonable and appropriate manner as prescribed under law and in accordance with the applicable professional standards.
- 3.4 Use confidential information and IPRs only to perform obligation under this arrangement; and reproduce confidential information and IPRs only required to perform its obligations under this arrangement.
- 3.5 This clause shall survive and continue even after the termination of the MoU.

CLAUSE 4: VALIDITY

4. This MoU is valid for a period of three years and can be extended further upon mutual approval and agreement.

CLAUSE 5: RELATIONSHIP BETWEEN THE PARTIES

- 5.1 It is expressly agreed that AITS Kadapa and TCT are acting under this MoU as independent contractors, and the relationship established under this MoU shall not be construed as a partnership. Neither Party is authorized to use the other Party's name in any way, to make any representations or create any obligation or liability, expressed or implied, on behalf of the other Party without the prior written consent of the other Party. Neither Party shall harbor or represent itself as having, any authority under the terms of this MoU to make agreements of any kind in the name of or binding upon the other Party or to pledge the other Party's credit, or to extend credit on behalf of the other Party.

[Handwritten signature]

[Handwritten signature]
PRINCIPAL
A. AINAMACHARYA INSTITUTE
COMPOSITE TECHNOLOGY

Annamacharya Institute of Technology & Sciences, Kadapa

Trioivision Composite Technologies Pvt Ltd., Kadapa

Any divergence or difference derived from the interpretation or application of the MoU shall be resolved by arbitration between the parties as per the Arbitration Act, 1996. The place of the arbitration shall be at District Head Quarters of AITS Kadapa. This undertaking is to be construed in accordance with Indian Law with exclusive jurisdiction in the Courts of Kadapa.

AGREED:

For **Annamacharya Institute of Technology & Sciences Kadapa**

A. Shetty
PRINCIPAL

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES,
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

For **Trioivision Composite Technologies Pvt Ltd., Kadapa**



Authorized Signatory

Annamacharya Institute of Technology & Sciences	Trioivision Composite Technologies Pvt Ltd.,
Utukur (P), C.K. Dinne (V & M), YSR Kadapa District, A.P. 516 003	Plot No. 176, Kopparthi mega Industrial Park, Ambavaram, Kadapa, Andhra Pradesh 516293.
9603999591	8919993254
aitskadapa@gmail.com	careers@trioivision.in
www.aitskadapa.ac.in	www.trioivision.in.

Witness1: *S. Saleem*

Witness2: *Chandrasekar*

A. Shetty
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M)

Witness1: *P. Dinna*

Witness2: *Chandrasekar*

Memorandum of Understanding

Between

Annamacharya Institute of Technology and Sciences

Utukur (P), C.K.Dine (V&M), Kadapa



&



Chaitanya Chemicals, Kadapa

for

Skill Development, Education; Training, Placement, Research
Services and Related Services

September 2021

ArBeebly
PRINCIPAL
ANNAMACHARYA INSTITUTE
TECHNOLOGY & SCIENCES
(V&M),

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called as the 'MoU') is entered into on this the 13 day of Sept - 2021 (13/09/2021) (DD/MM/YYYY),

By and Between

Annamacharya Institute of Technology & Sciences, Utukur(P), C.K. Dinne (V& YSR Kadapa Dt., Andhra Pradesh, 516003, (hereinafter referred to as 'A Kadapa') the First Party represented herein by its **Principal**, (the institution whose expression, unless excluded by or repugnant to the subject or context shall include successors - in-office, administrators and assigns).

And

Chaitanya Chemicals, plot no. : 5 & 6, Industrial Development Park, Kadapa Andhra Pradesh, 516004, (hereinafter referred to as 'Chaitanya Chemicals') the Second Party, and represented herein by its Managing Partner, **Mr. S.V. Ravi Moorthy**, (company whose expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

(AITS Kadapa and Chaitanya Chemicals are hereinafter jointly referred to as 'Parties' and individually as 'Party')

WHEREAS:

A) AITS Kadapa is a Higher Educational Institution named:

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES, Kadapa

- (i) AITS Kadapa is engaging in education and research at UG and PG levels and offering various courses of engineering.
- (ii) AITS Kadapa is operating under the flagship of Annamacharya Educational Trust.

B) **Chaitanya Chemicals**, the Second Party is engaged in Skill Development Education and R&D Services in the fields of - Barium Chemicals solution process and Maintenance Services, and educational support services.

C) **Chaitanya Chemicals**, the Second Party is promoted by **Mr.S.V. Ravi Moorthy, Chaitanya Chemicals Plot No: 5 & 6,, Industrial Development Park, Kadapa, Andhra Pradesh, 516004**

- (i) Shri Chaitanya Chemicals, Kadapa represented by **Mr. S.V. Ravi Moorthy**, Managing Partner, is established in 1999. Chaitanya Chemicals

today is the largest manufacturer of Barium Chloride ($BaCl_2$) (15000 MT per annum) and Sodium Hydro Sulphide (NaHS) (10000 MT per annum) in India, with an ISO 9001:2000. Chaitanya Chemicals is currently exporting to quality conscious consumers in the USA, Japan, S. Korea, France, Jordan, Singapore, South Africa, Nigeria, Dubai and Saudi Arabia. Till to date all Barium Chloride leaving Indian shores is manufactured by Chaitanya Chemicals.

- (ii) Since its establishment Chaitanya Chemicals is maintaining high standards in quality control. To keep up the standards Chaitanya Chemicals has a committed team of personnel monitoring the manufacturing process and manufactured products. They are totally committed to customer satisfaction. They deliver products of exceptional quality and tailor made to the specifications of our customers.
- D) AITS Kadapa & Chaitanya Chemicals believe that collaboration and cooperation between themselves will promote more effective use of each of their resources, and provide each of them with enhanced opportunities.
- E) The Parties intend to cooperate and focus their efforts on cooperation with area of Skill Based Training, Education and Research and any other areas upon mutual consent.
- F) Both Parties, being legal entities in themselves desire to sign this MOU for advancing their mutual interest.

NOW THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES SET FORTH IN MoU, THE PARTIES HERE TO AGREE AS FOLLOWS:

CLAUSE 1: CO-OPERATION

- 1.1 Both Parties are united by common interests and objectives, and they establish channels of communication and co-operation that will promote and advance their respective operations within the Institution and its related work. The Parties shall keep each other informed of potential opportunities and share all information that may be relevant to secure additional opportunities for one another.
- 1.2 AITS Kadapa and Chaitanya Chemicals co-operation will facilitate effective utilization of the intellectual capabilities of the faculty of AITS Kadapa. Significant inputs to them in developing suitable teaching/training and research systems, keeping in mind the needs of the industry.

- 1.3 The general terms of co-operation shall be governed by this MoU. The Parties cooperate with each other and shall, as promptly as reasonably practical, enter into all relevant agreements, deeds and documents (the 'Definitive Documents') which may be required to give effect to the actions contemplated in terms of this MoU. The term of Definitive Documents shall be mutually decided between the Parties. Along with the Definitive Documents, this MoU shall represent the understanding as to the subject matter hereof and shall supersede any understanding between the Parties on the subject matter hereof.

CLAUSE 2: SCOPE OF THE MoU

- 2.1 Both parties believe that close co-operation between the two would be of benefit to the student community to enhance their skills and knowledge. The following areas are covered under this MoU for engagement and cooperation to the benefit of the student community:
- Curriculum Design
 - Industrial Training and Visits
 - Internships and Placement of Students
 - Research and Development
 - Skill Development Programs
 - Guest Lectures and
 - Faculty Development Programs
- 2.2 **Curriculum Design:** Chaitanya Chemicals will give valuable inputs to AITS Kadapa in teaching/training methodology and suitably customize the curriculum so that the students fit into the industrial scenario meaningfully.
- 2.3 **Industrial Training & Visits:** Industry and Institution interaction will give insight into the latest developments/requirements of the industries; Chaitanya Chemicals shall arrange for the Faculty and Students of AITS Kadapa to visit associated companies and also involve in Industrial Training Programs for AITS Kadapa. The industrial training and exposure provided to students and faculty through this association will build confidence and prepare the students to have a smooth transition from academic to working career. Chaitanya Chemicals provide its Labs/Workshops/Industrial Sites for the hands-on training of learners enrolled with AITS Kadapa.
- 2.4 **Internships and Placement of Students:** Chaitanya Chemicals will act and engage to help the delivery of the internship and placement of students of AITS Kadapa into internships/jobs, as per AICTE Internship Policy. Chaitanya Chemicals

will also register itself on AICTE Internship Policy Portal for dissemination of Internship opportunities available with them.

- 2.5 **Research and Development:** Both Parties have agreed to carry out the research activities in the fields of Skill Development, Education and R&D Services in the fields of - Barium Chemical solution process and Maintenance Services
- 2.6 **Skill Development Programs:** Chaitanya Chemicals to engage in training students of AITS Kadapa on the emerging technologies in order to bridge the gap and make them industry ready.
- 2.7 **Guest Lectures:** Chaitanya Chemicals to extend the necessary support to deliver guest lectures to the students of AITS Kadapa on the technology trends and in-house requirements.
- 2.8 **Faculty Development Programs:** Chaitanya Chemicals will train the Faculty of AITS Kadapa for imparting industrial exposure/training and in knowledge/skill upgradation as per the industrial requirements.
- 2.9 Both Parties to obtain all internal approvals, consents, permissions, and licenses of whatever nature required for offering the Programs on the terms specified herein
- 2.10 There is no financial commitment on the part of the AITS Kadapa, the First Party to take up any program mentioned in the MoU. If there is any financial consideration it will be dealt separately and upon mutual consent.

CLAUSE 3: INTELLECTUAL PROPERTY

- 3.1 Nothing contained in this MoU shall, by express grant, implication, Estoppel or otherwise, create in either Party any right, title, interest, or license in or to any intellectual property (including but not limited to know-how, inventions, patents, copyrights and designs) of the other Party.
- 3.2 Each Party agrees and acknowledges that all the copyrights, trademarks, trade names and/or licensed software, service marks and trade secrets of either Party while conducting the business contemplated under this MoU shall always belong to such respective Party.
- 3.3 Protect the confidential information and IPRs in a reasonable and appropriate manner as prescribed under law and in accordance with applicable professional standards.

A. Reddy
PRINCIPAL

ACCEPTED FOR CHAITANYA CHEMICALS
PRINCIPAL MANAGING PARTNER
CHAITANYA CHEMICALS
MACHARYA INS. (INDREMO)

will also register itself on AICTE Internship Policy Portal for dissemination of Internship opportunities available with them.

- 2.5 **Research and Development:** Both Parties have agreed to carry out the research activities in the fields of Skill Development, Education and R&D in the fields of - Barium Chemical solution process and Maintenance Service.
- 2.6 **Skill Development Programs:** Chaitanya Chemicals to engage in training students of AITS Kadapa on the emerging technologies in order to bridge the gap and make them industry ready.
- 2.7 **Guest Lectures:** Chaitanya Chemicals to extend the necessary support to give guest lectures to the students of AITS Kadapa on the technology trends and house requirements.
- 2.8 **Faculty Development Programs:** Chaitanya Chemicals will train the Faculty of AITS Kadapa for imparting industrial exposure/training and in knowledge skill upgradation as per the industrial requirements.
- 2.9 Both Parties to obtain all internal approvals, consents, permissions, and licenses of what so ever nature required for offering the Programs on the terms specified herein.
- 2.10 There is no financial commitment on the part of the AITS Kadapa, the First Party to take up any program mentioned in the MoU. If there is any financial consideration it will be dealt separately and upon mutual consent.

CLAUSE 3: INTELLECTUAL PROPERTY

- 3.1 Nothing contained in this MoU shall, by express grant, implication, Estoppel or otherwise, create in either Party any right, title, interest, or license in or to Intellectual property (including but not limited to know-how, inventions, patents, copyrights and designs) of the other Party.
- 3.2 Each Party agrees and acknowledges that all the copyrights, trademarks, proprietary and/or licensed software, service marks and trade secrets of either Party while conducting the business contemplated under this MoU shall always belong to such respective Party.
- 3.3 Protect the confidential information and IPRs in a reasonable and appropriate manner as prescribed under law and in accordance with applicable professional standards.

A. Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF TECHNOLOGY
ANNAMACHARYA MANUJAM EMPOWERMENT SOCIETY
FOR CHAITANYA CHEMICALS
MANAGING PARTNER
ANNAMACHARYA MANUJAM EMPOWERMENT SOCIETY
ANNAMACHARYA MANUJAM EMPOWERMENT SOCIETY
ANNAMACHARYA MANUJAM EMPOWERMENT SOCIETY

- 3.4 Use confidential information and IPRs only to perform obligation and arrangement; and reproduce confidential information and IPRs only as reqt perform its obligations under this arrangement.
- 3.5 This clause shall survive and continue even after the termination of the MoU

CLAUSE 4: VALIDITY

4. This MoU is valid for a period of three years and can be extended furtl mutual approval and agreement

CLAUSE 5: RELATIONSHIP BETWEEN THE PARTIES


- 5.1 It is expressly agreed that AITS Kadapa and Chaitanya Chemicals are acting this MoU as independent contractors, and the relationship established unde MoU shall not be construed as a partnership. Neither Party is authorized to u: other Party's name in any way, to make any representations or create obligation or liability, expressed or implied, on behalf of the other Party, wi the prior written consent of the other Party. Neither Party shall have represent itself as having, any authority under the terms of this MoU to : agreements of any kind in the name of or binding upon the other Party, to p. the other Party's credit, or to extend credit on behalf of the other Party.


**Annamacharya Institute of Technology
& Sciences, Kadapa**

**Chaitanya Chemicals,
Kadapa**

Any divergence or difference derived from the interpretation or application o the MoU shall be resolved by arbitration between the parties as per the Arbitration Act, 1996. The place of the arbitration shall be at District Heac Quarters of AITS Kadapa. This undertaking is to be construed in accordance with Indian Law with exclusive jurisdiction in the Courts of Kadapa.

For CHAITANYA CHEMICALS


PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)


PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)


MANAGING PARTNER
(S.V. RAMA MOORTHY)

AGREED:

For Annamacharya Institute of
Technology & Sciences
Kadapa

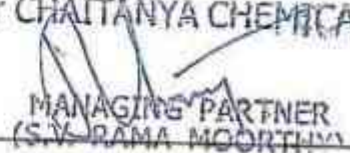


Authorized Signatory
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES

C.K. Dinne (V&M),

KADAPA - 516 003. (A.P.)

For Chaitanya Chemicals,
Kadapa
For CHAITANYA CHEMICALS



MANAGING PARTNER
(S.V. RAMA MOORTHY)

Authorized Signatory



Annamacharya Institute of Technology & Sciences	Chaitanya Chemicals
Utukur (P), C.K. Dinne (V & M), YSR Kadapa District, A.P. 516 003	Plot No. 5 & 6, Industrial Development Park, Kadapa, A.P. 516 004
9603999591	9397819301
aitskadapa@gmail.com	info@bariumindia.com
www.aitkadapa.ac.in	www.bariumindia.com

Witness1:



Witness1:



Witness2:




PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

Witness2:



Memorandum of Understanding

Between

Annamacharya Institute of Technology and Sciences

Utukur (P), C.K.Dine (V&M), Kadapa



&



Coign Consultants Pvt. Ltd. Kadapa

for

Skill Development, Education, Training, Placement, Research
Services and Related Services

September 2021

A. S. S. S.
PRINCIPAL
ANNAMACHARYA INSTITUTE
OF TECHNOLOGY & SCIENCES

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called as the 'MoU') is entered in on this the 2nd day of SEP - 02/09/2021 (DD/MM/YYYY),

By and Between

Annamacharya Institute of Technology & Sciences, Utukur(P), C.K. Dinne (V&M YSR Kadapa Dt., Andhra Pradesh, 516003, (hereinafter referred to as 'AITS Kadapa') the First Party represented herein by its Principal, (the institution which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

And

Coign Consultants Pvt. Ltd., Flat no. S11 3rd Floor, Ballad Estates, Tarnaka Secunderabad, 500017, India, (hereinafter referred to as 'COIGN') the Second Party, and represented herein by its Founder & CEO, Mr. K. Durga Naveen Kumar (company which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

(AITS Kadapa and COIGN are hereinafter jointly referred to as 'Parties' and individually as 'Party')

WHEREAS:

A) AITS Kadapa is a Higher Educational Institution named:

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES, Kadapa

- (i) AITS Kadapa is engaging in education and research at UG and PG level and offering various courses of engineering.
- (ii) AITS Kadapa is operating under the flagship of Annamacharya Educational Trust.

B) COIGN, the Second Party is engaged in Skill Development, Education and R&I Services in the fields of - Innovative Manufacturing Process and Maintenance Services, and educational support services.

C) COIGN, the Second Party is promoted by Mr. K. Durga Naveen Kumar, COIGN Consultants Pvt. Ltd., Flat no. S11 3rd Floor, Ballad Estates, Tarnaka Secunderabad, 500017, India

- (i) In 2006, a bunch of professionals working in different corporates came together to pursue a common idea of creating a platform that would be

(Handwritten signature)
ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES (V&M) YSR KADAPA DISTRICT
COIGN CONSULTANTS PVT. LTD.

the gap between academia and industry. With an understanding of what corporations expect and what the educational institutions need, COIGN has been rapidly surging forward by creating relevant and effecting training and development programs.

(ii) The Spirit of COIGN is the core of COIGN. These are the Values of COIGN. The Spirit is deeply rooted in the unchanging essence of COIGN. But It also embraces what they must aspire to be. It is the indivisible synthesis of the four values. The Spirit is a beacon. It is what gives them the direction and clear sense of purpose. It energizes us and is the touchstone for all that they do.

- D) AITS Kadapa & COIGN believe that collaboration and co-operation between themselves will promote more effective use of each of their resources, and provide each of them with enhanced opportunities.
- E) The Parties intent to cooperate and focus their efforts on cooperation within area of Skill Based Training, Education and Research and any other areas upon mutual consent.
- F) Both Parties, being legal entities in themselves desire to sign this MOU for advancing their mutual interest.

NOW THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES SET FORTH IN THIS MOU, THE PARTIES HERE TO AGREE AS FOLLOWS:

CLAUSE 1: CO-OPERATION

1.1 Both Parties are united by common interests and objectives, and they shall establish channels of communication and co-operation that will promote and advance their respective operations within the Institution and its related wing. The Parties shall keep each other informed of potential opportunities and shall share all information that may be relevant to secure additional opportunities for one another.

1.2 AITS Kadapa and COIGN co-operation will facilitate effective utilization of the intellectual capabilities of the faculty of AITS Kadapa providing significant input to them in developing suitable teaching/training and research systems, keeping in mind the needs of the industry.

1.3 The general terms of co-operation shall be governed by this MoU. The Parties shall cooperate with each other and shall, as promptly as reasonably practical, enter into all relevant agreements, deeds and documents (the 'Definitive Documents') a

APR 2014
PRINCIPAL
KADAPA
C.K. D...
FM COIGN CONSULTANTS PVT. LTD.

may be required to give effect to the actions contemplated in terms of this MoU. The term of Definitive Documents shall be mutually decided between the Parties. Along with the Definitive Documents, this MoU shall represent the entire understanding as to the subject matter hereof and shall supersede any previous understanding between the Parties on the subject matter hereof.

CLAUSE 2: SCOPE OF THE MoU

- 2.1 Both parties believe that close co-operation between the two would be of mutual benefit to the student community to enhance their skills and knowledge. The following areas are covered under this MoU for engagement and cooperation to the benefit of the student community:
- Curriculum Design
 - Industrial Training and Visits
 - Internships and Placement of Students
 - Research and Development
 - Skill Development Programs
 - Guest Lectures and ;
 - Faculty Development Programs
- 2.2 **Curriculum Design:** COIGN will give valuable inputs to AITS Kadapa on teaching/training methodology and suitably customize the curriculum so that students fit into the industrial scenario meaningfully.
- 2.3 **Industrial Training & Visits:** Industry and Institution interaction will give insight into the latest developments/requirements of the industries; COIGN shall arrange for the Faculty and Students of AITS Kadapa to visit its associated companies and also involve in Industrial Training Programs for AITS Kadapa. The industrial training and exposure provided to students and faculty through this association will build confidence and prepare the students to have a smooth transition from academic to working career. COIGN will provide Labs/Workshops/Industrial Sites for the hands-on training of the learners enrolled with AITS Kadapa.
- 2.4 **Internships and Placement of Students:** COIGN will actively engage to help in the delivery of the internship and placement of students of AITS Kadapa through internships/jobs, as per AICTE Internship Policy. COIGN will also register itself on the AICTE Internship Policy Portal for disseminating the Internship opportunities available with them.

- 2.5 **Research and Development:** Both Parties have agreed to carry out the joint research activities in the fields of Skill Development, Education and R&D Services in the fields of - Innovative Manufacturing process and Maintenance Services.
- 2.6 **Skill Development Programs:** COIGN to engage in training the students of AITS Kadapa on the emerging technologies in order to bridge the skill gap and make them industry ready.
- 2.7 **Guest Lectures:** COIGN to extend the necessary support to deliver guest lectures to the students of AITS Kadapa on the technology trends and in-house requirements.
- 2.8 **Faculty Development Programs:** COIGN will train the Faculties of AITS Kadapa for imparting industrial exposure/training and in knowledge and skill upgradation as per the industrial requirements.
- 2.9 Both Parties to obtain all internal approvals, consents, permissions, and licenses what so ever nature required for offering the Programs on the terms specified herein.
- 2.10 There is no financial commitment on the part of the AITS Kadapa, the First Party to take up any program mentioned in the MoU. If there is any financial consideration it will be dealt separately and upon mutual consent.

CLAUSE 3: INTELLECTUAL PROPERTY

- 3.1 Nothing contained in this MoU shall, by express grant, implication, Estoppel or otherwise, create in either Party any right, title, interest, or license in or to the intellectual property (including but not limited to know-how, inventions, patents, copy rights and designs) of the other Party.
- 3.2 Each Party agrees and acknowledges that all the copyrights, trademarks, proprietary and/or licensed software, service marks and trade secrets of each Party while conducting the business contemplated under this MoU shall always belong to such respective Party.
- 3.3 Protect the confidential information and IPRs in a reasonable and appropriate manner as prescribed under law and in accordance with the applicable professional standards.

A. Sridhar
 PRINCIPAL
 ANNAMACHARYA INSTITUTE OF
 TECHNOLOGY & MANAGEMENT

A. Sridhar
 PRINCIPAL
 ANNAMACHARYA INSTITUTE OF
 TECHNOLOGY & MANAGEMENT
 C.K. Dinne (V&M),
 03, (A.P.)

- 3.4 Use confidential information and IPRs only to perform obligation under arrangement; and reproduce confidential information and IPRs only as required to perform its obligations under this arrangement.
- 3.5 This clause shall survive and continue even after the termination of the MoU.

CLAUSE 4: VALIDITY

4. This MoU is valid for a period of three years and can be extended further by mutual approval and agreement.

CLAUSE 5: RELATIONSHIP BETWEEN THE PARTIES

- 5.1 It is expressly agreed that AITS Kadapa and COIGN are acting under this MoU as independent contractors, and the relationship established under this MoU shall not be construed as a partnership. Neither Party is authorized to use the other Party's name in any way, to make any representations or create any obligations or liability, expressed or implied, on behalf of the other Party, without the written consent of the other Party. Neither Party shall have, nor represent itself as having, any authority under the terms of this MoU to make agreements of any kind in the name of or binding upon the other Party, to pledge the other Party's credit or to extend credit on behalf of the other Party.

Annamacharya Institute of Technology
& Sciences, Kadapa

COIGN Consultants Pvt. Ltd.,
Kadapa

Any divergence or difference derived from the interpretation or application of the MoU shall be resolved by arbitration between the parties as per the Arbitration Act, 1996. The place of the arbitration shall be at District Headquarters of AITS Kadapa. This undertaking is to be construed in accordance with Indian Law with exclusive jurisdiction in the Courts of Kadapa.


Asloddy
ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES (V&M)
Asloddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)
[Signature]
DIRECTOR
COIGN CONSULTANTS PVT. LTD.


AGREED:

For Annamacharya Institute of
Technology & Sciences
Kadapa


For COIGN Consultant Pvt. Ltd.,
Kadapa


For COIGN CONSULTANTS PVT. LTD.

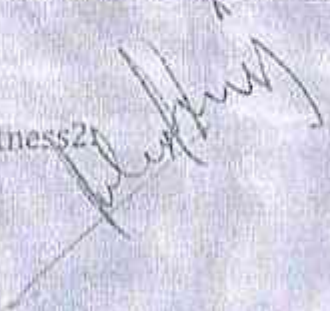

Principal
Authorized Signatory: UTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)



Authorized Signatory Director

Annamacharya Institute of Technology & Sciences	COIGN Consultants Pvt. Ltd.,
Utukur (P), C.K. Dinne (V & M), YSR Kadapa District, A.P. 516 003	Flat no. S11 3 rd Floor, Ballad Estate Tarnaka, Secunderabad, 500017, India
9603999591	+91 (040) 66906107
aitskadapa@gmail.com	info@coign.net
www.aitskadapa.ac.in	www.Coign.in

Witness1: 

Witness1: 

Witness2: 

Witness2: 
Principal
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)



MEMORANDUM OF UNDERSTANDING

Between

**Annamacharya Institute of Technology and Sciences
Utukur (P), C.K.Dine (V&M), Kadapa**



&

Valika Electronics

Address :Valika Electronics, 3/70, Nagaram, Hyderabad 500083

Off : 040 20081483

Email : valikaelectronics_info@gmail.com, website :www.valikaelectronics.com

FOR

EDUCATION, TRAINING, RESEARCH SERVICES AND RELATED
SERVICES

on

July 2019

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called as the 'MoU') is entered into on this the 19th day of July - 2019 (DD/MM/YYYY),

By and Between

Annamacharya Institute of Technology & Sciences, Utukur(P), C.K. Dinne (V&M), YSR Kadapa Dt., Andhra Pradesh, 516003, (hereinafter referred to as 'AITS Kadapa') the **First Party** represented herein by its **Principal, Dr.A.Sudhakara Reddy** (the Institution which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

And

Valika Electronics, 3/70, Nagaram, Hyderabad, Telangana 500083, the **Second Party**, and represented herein by its Director **Mr. C. Maguvali**, (company which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

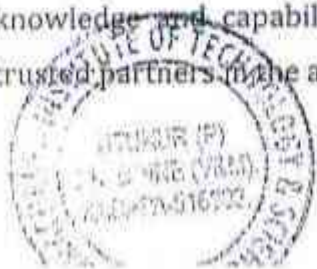
(AITS Kadapa and Valika Electronics are hereinafter jointly referred to as 'Parties' and individually as 'Party')

Annamacharya Institute of Technology & Sciences, YSR Kadapa has entered into a Memorandum of Understanding (MoU) with Valika Electronics for mutual exchange of Information and Technological know- how, joint collaborative work in R&D projects, internships, improvement of research and academic programmes and also exchange of experts and researchers.

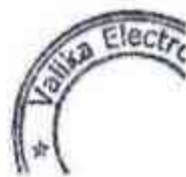
For signing of the MoU, Valika Electronics was represented by its Director Mr.C. Maguvali while Annamacharya Institute of Technology & Sciences, YSR Kadapa by Principal Dr.A.Sudhakara Reddy.

The MOU states that the two organizations will honour the agreement by:

1. Promoting interaction between Annamacharya Institute of Technology & Sciences, YSR Kadapa and Valika Electronics in mutually beneficial areas of upcoming technologies in the principal technical and research areas of technical defined Networks, Digital solutions, initiate joint (pilot) projects in this realm sharing knowledge and capability in the concern areas for mutual benefits and become trusted partners in the area of knowledge enrichment.



Agreeably
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES



2. Facilitate work from Annamacharya Institute of Technology & Sciences, for Kadapa students/ facilities and Vice versa on projects identified for collaborative business.

3. To conceptualize the research projects to be executed in collaboration on need basis.

4. To support the institute in following activities.

i. Research work

ii. Laboratory/ infrastructure Development

iii. Capability development of the students

iv. Sponsored projects

5. Workshops, Conclave, seminars, Events

Valika Electronics are the manufacturers, suppliers of educational training systems in Hyderabad. All through these years they have been successfully able to cater to the needs of all kinds of engineering training equipments, ensuring the highest.

The Memorandum signed will be the guiding document for both the parties for execution of the actions and initiatives in the near future. Both the organizations will encourage its members to define the overall strategy and roadmap to carry out the action points contained in it.

This Memorandum of Understanding is intended to express the broad understanding of the parties regarding their working with each other to the extent possible for their mutual benefit. IN WITNESS WHEREOF the parties have set their hands hereto on the day and year first here in above written under their respective seal of office. This MoU is valid for a period of three years and can be extended further by mutual approval and agreement



Agreddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

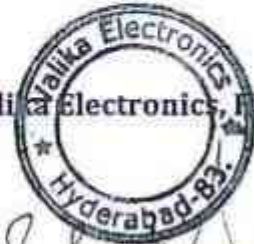


any divergence or difference derived from the interpretation or application of the MoU shall be resolved by arbitration between the parties as per the Arbitration Act, 1996. The place of the arbitration shall be at District Head Quarters of AITS Kadapa. This undertaking is to be construed in accordance with Indian Law with exclusive jurisdiction in the Courts of Kadapa.

AGREED:

For **Annamacharya Institute of Technology & Sciences Kadapa**

For **Valika Electronics, Hyderabad**



[Signature]

 Authorized Signatory
 ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES
 C.K. Dinne (V&M),
 KADAPA - 516 003. (A.P.)

[Signature]

 Authorized Signatory

Annamacharya Institute of Technology & Sciences	Valika Electronics
Utukur (P), C.K. Dinne (V & M), YSR Kadapa District, A.P. 516 003	3/70, Nagaram, Hyderabad, Telangana 500083
9603999591	040-20081483
aitskadapa@gmail.com	valikaelectronics_info@gmail.com,
www.aitskadapa.ac.in	www.valikaelectronics.com

Witness 1: *[Signature]*

Witness 1: *[Signature]*

Witness 2: *[Signature]* *[Signature]*

Witness 2: *[Signature]*

PRINCIPAL
 ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES
 C.K. Dinne (V&M),
 KADAPA - 516 003. (A.P.)

MEMORANDUM OF UNDERSTANDING

Between

**Annamacharya Institute of Technology and Sciences
Utukur (P), C.K.Dine (V&M), Kadapa**



&

SIBAR AUTO PARTS Ltd

ISO 9001:2008 CERTIFIED COMPANY

SIBAR AUTO PARTS Limited, Tirupati

FOR

SKILL DEVELOPMENT, EDUCATION, TRAINING AND RELATED
SERVICES

on

July 2018

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called as the 'MoU') is entered into on this the 23rd day of July 2018
(DD/MM/YYYY),

By and Between

Annamacharya Institute of Technology & Sciences, Utukur(P), C.K. Dinne (V&M), YSR Kadapa Dt., Andhra Pradesh, 516003, (hereinafter referred to as 'AITS Kadapa') the **First Party** represented herein by its **Principal**, (the institution which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

And

SIBAR Auto parts Ltd, D4 and D5, Industrial Estate, Renigunta Road, Tirupati, Andhra Pradesh, 517506, (hereinafter referred to as 'SIBAR') the **Second Party**, and represented herein by its Managing Director, **Mr. P.Madhu Pratap**, (company which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

(AITS Kadapa and SIBAR are hereinafter jointly referred to as 'Parties' and individually as 'Party')

WHEREAS:

A) AITS Kadapa is a Higher Educational Institution named:

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES, Kadapa

- (i) AITS Kadapa is engaging in education and research at UG and PG levels and offering engineering, and computer application programs.
- (ii) AITS Kadapa is operating under the flagship of Annamacharya Educational Trust.

B) **SIBAR**, the Second Party is engaged in Skill Development, Education and R&D Services in the fields of - Innovative Manufacturing Process and Maintenance Services, and educational support services.

(i) **SIBAR**, the Second Party is promoted by **Mr.P.Madhu Prathap, SIBAR**



Prathap
PRINCIPAL

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES



AUTO PARTS LTD, D4 and D5, INDUSTRIAL ESTATE, KENIGUNTA ROAD, Tirupati, Andhra Pradesh, 517506.

- (ii) Sibar Auto Parts Limited, Tirupati has been awarded as ISO 9001:2008 quality management system approved organization.
 - (iii) It was originally incorporated as private limited in 1983 and had a technical collaboration with an Italian firm to refine its technology in Electro plating, and concentrating on any purposeful Gravity Die Castings in addition to the Cylinder Blocks and Cylinder Heads.
 - (iv) The company is keen in expanding its activity in Low Pressure Die Casting also in the near future. It is in rapid process.
 - (v) The main strength of the company is technically strong in their supplies and commitment towards continuous improvement in quality and related aspects.
- C) AITS Kadapa & SIBAR believe that collaboration and co-operation between themselves will promote more effective use of each of their resources, and provide each of them with enhanced opportunities.
- D) The Parties intent to cooperate and focus their efforts on cooperation within area of Skill Based Training, Education and Research and any other areas upon mutual consent.
- E) Both Parties, being legal entities in themselves desire to sign this MOU for advancing their mutual interest.

NOW THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES SET FORTH IN THIS MoU, THE PARTIES HERE TO AGREE AS FOLLOWS:

CLAUSE 1: CO-OPERATION

- 1.1 Both Parties are united by common interests and objectives, and they shall establish channels of communication and co-operation that will promote and advance their respective operations within the Institution and its related wings. The Parties shall keep each other informed of potential opportunities and shall share all information that may be relevant to secure additional opportunities for one another.
- 1.2 AITS Kadapa and SIBAR co-operation will facilitate effective utilization of the intellectual capabilities of the faculty of AITS Kadapa providing significant



inputs to them in developing suitable teaching/ training and research systems, keeping in mind the needs of the industry.

- 1.3. The general terms of co-operation shall be governed by this MoU. The Parties shall cooperate with each other and shall, as promptly as reasonably practical, enter into all relevant agreements, deeds and documents (the 'Definitive Documents') as may be required to give effect to the actions contemplated in terms of this MoU. The term of Definitive Documents shall be mutually decided between the Parties.

CLAUSE 2: SCOPE OF THE MoU

- 2.1 Both parties believe that close co-operation between the two would be of major benefit to the student community to enhance their skills and knowledge. The following areas are covered under this MoU for engagement and cooperation for the benefit of the student community:

- a. Industrial Training and Visits
- b. Internships for Students
- c. Research and Development
- d. Skill Development Programs

- 2.2 **Industrial Training & Visits:** Industry and Institution interaction will give an insight into the latest developments/requirements of the industries; SIBAR shall arrange for the Faculty and Students of AITS Kadapa to visit its associated companies and also involve in Industrial Training Programs for AITS Kadapa.

SIBAR will provide its Labs/Workshops/Industrial Sites for the hands-on training of the learners enrolled with AITS Kadapa.

- 2.4 **Internships and Placement of Students:** SIBAR will actively engage to help the delivery of the internship and placement of students of AITS Kadapa into internships/jobs, as per AICTE internship Policy.

SIBAR will also register itself on AICTE Internship Policy Portal for disseminating the Internship opportunities available with them.

- 2.5 **Research and Development:** Both Parties have agreed to carry out the joint research activities in the fields of Skill Development, Education and R&D Services in the fields of - Innovative Manufacturing process and Maintenance Services.



Abbas
PRINCIPAL
ANNAMACHARYA INSTITUTE
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),



- 2.7 Both Parties to obtain all internal approvals, consents, permissions, and licenses of what so ever nature required for offering the Programs on the terms specified herein.
- 2.10 There is no financial commitment on the part of the AITS Kadapa, the First Party to take up any program mentioned in the MoU. If there is any financial consideration, it will be dealt separately and upon mutual consent.

CLAUSE 3: INTELLECTUAL PROPERTY

- 3.1 Nothing contained in this MoU shall, by express grant, implication, Estoppel or otherwise, create in either Party any right, title, interest, or license in or to the intellectual property (including but not limited to know-how, inventions, patents, copy rights and designs) of the other Party.
- 3.2 Each Party agrees and acknowledges that all the copyrights, trademarks, proprietaryand/or licensed software, service marks and trade secrets of each Party while conductingthe business contemplated under this MoU shall always belong to such respective Party.
- 3.3 Protect the confidential information and IPRs in a reasonable and appropriatemanner as prescribed under law and in accordance with the applicableprofessional standards.
- 3.4 his clause shall survive and continue even after the termination of the MoU.

CLAUSE 4: VALIDITY

4. This MoU is valid for a period of five years and can be extended further by mutual approval and agreement

CLAUSE 5: RELATIONSHIP BETWEEN THE PARTIES

- 5.1 It is expressly agreed that AITS Kadapa and SIBAR are acting under this MoU as independent contractors, and the relationship established under this MoU shall not be construed as a partnership.

Annacharya Institute of Technology
& Sciences, Kadapa



SIBAR Auto Parts Pvt Ltd
Tirupati



Abhishek
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M)

Any divergence or difference derived from the interpretation or application of the MoU shall be resolved by arbitration between the parties as per the Arbitration Act, 1996. The place of the arbitration shall be at District Head Quarters of AITS Kadapa. This undertaking is to be construed in accordance with Indian Law with exclusive jurisdiction in the Courts of Kadapa.

AGREED:

For Annamacharya Institute of
Technology & Sciences
Kadapa

A. Reddy
PRINCIPAL

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M)

KADAPA 516 003 (A.P.)

Annamacharya Institute of Technology & Sciences	SIBAR AUTO PARTS Ltd.,
Utukur (P), C.K. Dinne (V & M), YSR Kadapa District, A.P. 516 003	D4 and D5, Industrial Estate, Renigunta Road, Tirupati, A.P 517506
9603999591	0877 2271377
aitskadapa@gmail.com	sibarauto_77@yahoo.com
www.aitskadapa.ac.in	www.sibarauto.com

For SIBAR AUTO PARTS Ltd
Tirupati

SIBAR AUTO PARTS LTD
D4 & D5,
Industrial Estate
Renigunta Road
Tirupati
(A.P.)
P. Rathel

Authorized Signatory

Witness1: *A. Reddy*

Witness2: *P. Reddy*

Witness1: *[Signature]*

Witness2: *[Signature]*

A. Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

MEMORANDUM OF UNDERSTANDING

Between

Annamacharya Institute of Technology and Sciences
Utukur (P), C.K.Dine (V&M), Kadapa



&



SUN SEAS TECH, HYDERABAD, TELANGANA

FOR

SKILL DEVELOPMENT, EDUCATION, TRAINING, RESEARCH
SERVICES AND RELATED SERVICES

on

July 2017

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called as the 'MoU') is entered into on this the 24th day of July - 2017 (DD/MM/YYYY),

By and Between

Annamacharya Institute of Technology & Sciences, Utukur(P), C.K. Dinne (V&M), YSR Kadapa Dist., Andhra Pradesh, 516003, (hereinafter referred to as 'AITS Kadapa') the **First Party** represented herein by its **Principal**, (the institution which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

And

Sun Seas Tech, Shop No 103 & 104, 1st Floor, KSR Towers, Plot No 9 and 10, Chandanagar, Serilingampally, Rangareddy Dist., Telangana - 500050, (hereinafter referred to as 'Sun Seas Tech') the **Second Party**, and represented herein by its Managing Director **Mr.S.Vijay Kumar**, any which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

(AITS Kadapa and Sun Seas Tech are hereinafter jointly referred to as 'Parties' and individually as 'Party')

WHEREAS:

A) **AITS Kadapa** is a Higher Educational Institution named:

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES, Kadapa

- (i) AITS Kadapa is engaging in education and research at UG and PG levels and offering engineering, programs.
- (ii) AITS Kadapa is operating under the flagship of Annamacharya Educational Trust.

B) "**Sun Seas Tech**", the second party, is established in 1996 is promoted by **Mr.S.Vijay Kumar, 1st Floor, KSR Towers, Plot No 9 and 10, Chandanagar, Serilingampally, Rangareddy Distm Telangana - 500050** to cater the needs of Education and Industrial establishments.

- (i) Products of sun seas tech are delivered across the globe and many satisfied customers are the best guarantee of its first-rate service.

- (ii) Many of its products are also extensively used by Researchers,



Signature
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES

For **SUN SEAS TEC**

Managing Partner
(S. VIJAY KUMAR)

Electronics, Electrical, Instrumentation, Communication and Bio Medical engineers.

- (iii) With a client list spanning nearly in all industries, and colleges, Sun seas Tech have benefited customers of many different sizes, from non-profit organizations to companies.
 - (iv) By acquaintance with Sun seas Tech access is provided to Current technology, Development tools, Reference Schematics, Sample source code and Step-by-Step action plans for completing Key projects.
 - (v) Full access is given to Sun Seas Tech research archives and knowledge base.
- C) AITS Kadapa & Sun Seas Tech believe that collaboration and co-operation between themselves will promote more effective use of each of their resources, and provide each of them with enhanced opportunities.
- D) Annamacharya Institute of Technology & Sciences, YSR Kadapa strongly believes in working towards a goal which is not merely theoretical in content but practical in approach
- E) Both Parties, being legal entities in themselves desire to sign this MOU for advancing their mutual interest.

NOW THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES SET FORTH IN THIS MoU, THE PARTIES HERE TO AGREE AS FOLLOWS:

CLAUSE 1: CO-OPERATION

- 1.1 Both Parties are united by common interests and objectives, and they shall establish channels of communication and co-operation that will promote and advance their respective operations within the Institution and its related wings. The Parties shall keep each other informed of potential opportunities and shall share all information that may be relevant to secure additional opportunities for one another.
- 1.2 AITS Kadapa and Sun seas tech co-operation will facilitate effective utilization of the intellectual capabilities of the faculty of AITS Kadapa providing significant inputs to them in developing suitable teaching/training and research systems, keeping in mind the needs of the industry.



Aswathy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
YSR KADAPA

For SUN SEAS Tech

Managing Partner
(S. VIJAY KUMAR)

- 1.3 The general terms of co-operation shall be governed by this MoU. The Parties shall cooperate with each other and shall, as promptly as reasonably practical, enter into all relevant agreements, deeds and documents (the 'Definitive Documents') as may be required to give effect to the actions contemplated in terms of this MoU. The term of Definitive Documents shall be mutually decided between the Parties. Along with the Definitive Documents, this MoU shall represent the entire understanding as to the subject matter hereof and shall supersede any prior understanding between the Parties on the subject matter hereof.

CLAUSE 2: SCOPE OF THE MoU

- 2.1 Both parties believe that close co-operation between the two would be of major benefit to the student community to enhance their skills and knowledge.
- 2.2 To impart training to the students and staff of the Institute by the industry. To facilitate regular interaction between the faculty and student of the institute and the workforce of the industry. Industry to provide regular active inputs in curriculum revision of the
- 2.3 The institute and Industry shall explore the possibilities of mutual support in their learning, hiring and research requirements based on mutual convenience.
- 2.4 Each party shall maintain complete confidentiality of any information of the other disclosed during the term of this MoU.
- 2.5 There is no financial commitment on the part of the AITS Kadapa, the First Party to take up any program mentioned in the MoU. If there is any financial consideration, it will be dealt separately and upon mutual consent.
- 2.6 **Sun seas Tech** and **AITS Kadapa** hereby agree to enter into a partnership to enable **Sun seas Tech** Solutions to close the education gap by facilitating the conduct of technical seminars, symposiums, workshops, project seminars and launching campus placement drives, providing requisite training and deploying trained technical man power into the market.

CLAUSE 3: INTELLECTUAL PROPERTY

- 3.1 Nothing contained in this MoU shall, by express grant, implication, Estoppel or otherwise, create in either Party any right, title, interest, or license in or to



Arocky
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES

For **SUN SEAS TEC**

Managing Partner
(C. VIJAY KUMAR)

the intellectual property (including but not limited to know-how, inventions, patents, copy rights and designs) of the other Party.

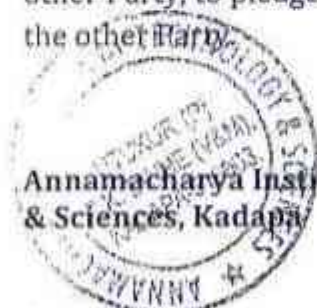
- 3.2 Each Party agrees and acknowledges that all the copyrights, trademarks, proprietary and/or licensed software, service marks and trade secrets of each Party while conducting the business contemplated under this MoU shall always belong to such respective Party.
- 3.3 Protect the confidential information and IPRs in a reasonable and appropriate manner as prescribed under law and in accordance with the applicable professional standards.
- 3.4 Use confidential information and IPRs only to perform obligation under this arrangement; and reproduce confidential information and IPRs only as required to perform its obligations under this arrangement.
- 3.5 This clause shall survive and continue even after the termination of the MoU.

CLAUSE 4: VALIDITY

4. This MoU is valid for a period of three years and can be extended further by mutual approval and agreement

CLAUSE 5: RELATIONSHIP BETWEEN THE PARTIES

- 5.1 It is expressly agreed that AITS Kadapa and Sun Seas Tech are acting under this MoU as independent contractors, and the relationship established under this MoU shall not be construed as a partnership. Neither Party is authorized to use the other Party's name in any way, to make any representations or create any obligation or liability, expressed or implied, on behalf of the other Party, without the prior written consent of the other Party. Neither Party shall have, nor represent itself as having, any authority under the terms of this MoU to make agreements of any kind in the name of or binding upon the other Party, to pledge the other Party's credit, or to extend credit on behalf of the other Party.



**Annamacharya Institute of Technology
& Sciences, Kadapa**

For SUN SEAS TECH

**Managing Partner
Sun Seas Tech (KUMAR)
Hyderabad, Telangana**


Any divergence or difference derived from the interpretation or application of the MoU shall be resolved by arbitration between the

Anubha
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES, KADAPA


parties as per the Arbitration Act, 1996. The place of the arbitration shall be at District Head Quarters of AITS Kadapa. This undertaking is to be construed in accordance with Indian Law with exclusive jurisdiction in the Courts of Kadapa.

AGREED:
For **SUN SEAS TECH**



For **Annamacharya Institute of
Technology & Sciences
Kadapa**

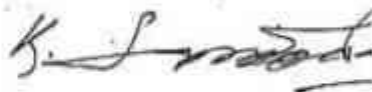


Authorized Signatory
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)


For **Managing Partner
(S. VIJAY KUMAR)
Sun Seas Tech,
Hyderabad**


Authorized Signatory

Annamacharya Institute of Technology & Sciences	Sun Seas Tech, Hyderabad
Utukur (P), C.K. Dinne (V & M), YSR Kadapa District, A.P. 516 003	KSR Towers, Plot No 9 and 10, Chandanagar, Serilingampally, Rangareddy Distm Telangana - 500050
9603999591	+91-40-23038777
aitskadapa@gmail.com	sunseastech_hyd@gmail.com
www.aitskadapa.ac.in	www.sunseastech.com

Witness1: 
Witness2: 

Witness1: 
Witness2: 


PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

MEMORANDUM OF UNDERSTANDING

Between

Annamacharya Institute of Technology and Sciences
Utukur (P), C.K.Dine (V&M), Kadapa



&



S.S. Lab Equipments

Flat #.125 East Gandhi Nagar, Rampally 'X' Road, Hyderabad-500083

Tele/Fax: 040-27120787

E-mail: sslab_2k5@gmail.com

Web: www.sslabindia.com

FOR

SKILL DEVELOPMENT, TRAINING, RESEARCH SERVICES AND
RELATED SERVICES

on

September 2016

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called as the 'MoU') is entered into on this the 29th day of Sept - 2016 (DD/MM/YYYY),

By and Between

Annamacharya Institute of Technology & Sciences, Utukur(P), C.K. Dinne (V&M), YSR Kadapa Dt., Andhra Pradesh, 516003, (hereinafter referred to as 'AITS Kadapa') the **First Party** represented herein by its **Principal, Dr.A.Sudhakara Reddy** (the institution which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

And

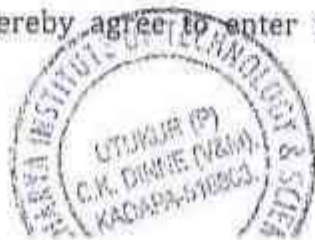
S.S.Lab Equipments, Flat #.125 East Gandhi Nagar, Rampally 'X'-Road, Hyderabad- 500083 and represented herein by its Managing Director, **J. Govind Rao** (company which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

(AITS Kadapa and **S.S.Lab Equipments** are hereinafter jointly referred to as 'Parties' and individually as 'Party')

PREAMBLE

SS Lab Equipments, the best one in supplying and servicing of all equipments to all engineering colleges throughout the length and breadth of India, distinctive, highly innovative and successful. The Management philosophy of SS Lab Equipments lies in its mission to contribute to the Educational needs of Engineering colleges and to society in general by distinguishing itself as a prominent and well established company through customer satisfaction. To realize this goal, it is strived to meet customer requirements in product quality, price, delivery and services.. The company's excellent in-house technical team and production facilities enable it to respond quickly and effectively and has been chosen as the only source to many of the leading engineering colleges across AP like AITS Kadapa for all their electronic equipments.

SS Lab Equipments and Annamacharya Institute of Technology & Sciences, Kadapa hereby agree to enter into a partnership to enable the students to



empower themselves with practical knowledge making them industry ready and deploying trained technical man power into the market.

The parties hereby come to an understanding as follows:

SS Lab Equipments wishes to partner and Annamacharya Institute of Technology & Sciences, Kadapa agreed to be partnered with SS Lab Equipments to perform the following services identified as under.

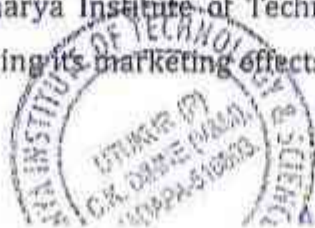
1. Services Offered:

- a. Electronic Devices
- b. Spectrum Analyzers
- c. Digital Oscilloscopes
- d. Integrated Circuit Technology
- e. Analog Communication
- f. Digital Communication
- g. Optical Communication
- h. Digital Circuits
- i. Others

2. Scope of Work: SS Lab Equipments, operating under this MOU and without limitation perform the following services.

- a. Trains the student and faculty to gain knowledge on design of electronic equipment such as oscilloscopes, network analyzers and power analyzers with adoption of new technologies, processes and systems for improved, reliable and cost-effective products and service.
- b. Encourage students to register for the SS Lab Equipments program and services.
- c. Periodic Interaction with the students of the college for training on employability enhancement program courseware.
- d. Conducting the periodic faculty/student assessment as per the conditions laid by SS Lab Equipments.

3. Communicating CPA (College – Partner Agreement) to third party: SS Lab Equipments may inform its stake holders about the college partner agreement with Annamacharya Institute of Technology & Sciences, Kadapa and may use college logo during its marketing effects. The college may in turn inform its stake



Aswathy

PRINCIPAL

ANNAMACHARYA INSTITUTE OF



holders about SS Lab Equipments and use SS Lab Equipments logo on its website, or other published materials.

4. Term of College Partner Agreement: The CPA will be in effect for a period of 5 years from the date of this agreement and shall be renewed automatically for an additional 1 year term if neither party choose to terminate the agreement.

5. Non - Disclosure: During the term of this MOU, SS Lab Equipments and AITS, Kadapa will be bound by confidentiality and non - disclosure and neither will reveal confidential information received as part of the collaboration here under to a third party. Non - disclosure only applies to information that is not already readily available in the public domain or which a party rightfully has obtained elsewhere or which a party has been ordered by a relevant court or authority to reveal disclosure and neither will reveal confidential information received as part of the collaboration here under to a third party.

6. Liability: To the extent not otherwise stated in applicable terms and conditions none of the parties should be liable for consequential damages such as lost profit.

7. Termination: This MOU may be subject to termination by either party at any time however any obligations from either side accrued during the term shall be fulfilled.

8. Disputes: Any controversy or claim arising out of or relating to this MOU or breach thereof will be settled through arbitration as per international arbitration methods.

9. Amendment: This MOU may be amended only by a written instrument signed by the duly authorized representatives of both parties.

10. Partial invalidity: If any provision of this MOU is held by a court of competent jurisdiction to be invalid void or unenforceable, the remaining provisions will nevertheless continue to be in force without being impaired or invalidated in any way.

11. Governing Law: This MOU will in all respects be governed by and construed and interpreted in accordance with the laws of India.

In witness where of SS Lab Equipments and Annamacharya Institute of Technology & Sciences each has caused this MOU to be executed on its behalf as



A. Reddy

PRINCIPAL
ANNAMACHARYA INSTITUTE OF



of date first written above.

Any divergence or difference derived from the interpretation or application of the MoU shall be resolved by arbitration between the parties as per the Arbitration Act, 1996. The place of the arbitration shall be at District Head Quarters of AITS Kadapa. This undertaking is to be construed in accordance with Indian Law with exclusive jurisdiction in the Courts of **Kadapa**.

AGREED:

For Annamacharya Institute of
Technology & Sciences, Kadapa
Hyderabad

For S.S. Lab Equipments
Hyderabad



PRINCIPAL

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M)
KADAPA - 516 003 (A.P.)

Authorized Signatory

Annamacharya Institute of Technology & Sciences	S.S. Lab Equipments
Utukur (P), C.K. Dinne (V & M), YSR Kadapa District, A.P. 516 003	Flat #.125 East Gandhi Nagar, Rampally 'X'-Road, Hyderabad-500083
9603999591	040-27120787
aitskadapa@gmail.com	sslabs_2k5@gmail.com
www.aitskadapa.ac.in	www.sslabindia.com

Witness1:

Witness2:

Witness1:

Witness2:

PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

MEMORANDUM OF UNDERSTANDING

Between

**Annamacharya Institute of Technology and Sciences
Utukur (P), C.K.Dine (V&M), Kadapa**



&



Vi Microsystems Pvt. Ltd., Chennai

FOR

**SKILL DEVELOPMENT, EDUCATION, TRAINING, PLACEMENT,
RESEARCH SERVICES AND RELATED SERVICES**

on

June 2016

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter called as the 'MoU') is entered into on this the 08th day of June 2016
(DD/MM/YYYY),

By and Between

Annamacharya Institute of Technology & Sciences, Utukur(P), C.K. Dinne (V&M), YSR Kadapa Dt., Andhra Pradesh, 516003, (hereinafter referred to as 'AITS Kadapa') the **First Party** represented herein by its **Principal, Dr.A. Sudhakara Reddy** (the institution which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

And

Vi Microsystems Pvt.Ltd.,Plot 75, Electronics Estate, Perungudi, Chennai – 600 096. (hereinafter referred to as 'Vi Microsystems') the **Second Party**, and represented herein by its Managing Director, **Mr.S. Suresh**. (company which expression, unless excluded by or repugnant to the subject or context shall include its successors - in-office, administrators and assigns).

(AITS Kadapa and Vi Microsystems are hereinafter jointly referred to as 'Parties' and individually as 'Party')

WHEREAS:

A) AITS Kadapa is a Higher Educational Institution named:

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES, Kadapa

- (i) AITS Kadapa is engaging in education and research at UG and PG levels and offering engineering, and computer application programs.
- (ii) AITS Kadapa is operating under the flagship of Annamacharya Educational Trust.

B) Vi Microsystems, the Second Party is engaged in Skill Development, Education and R&D Services in the fields of - Innovative Manufacturing Process and Maintenance Services, and educational support services and is promoted by **Mr.S.Suresh, Vi Microsystems Pvt. Ltd., Plot 75, Electronics Estate, Perungudi, Chennai –600 096.**

C) Vi Microsystems, the leader in manufacturing engineering products and



A. Reddy
PRINCIPAL

Vi Microsystems Pvt.
75, Electronics Estate
Perungudi, Chennai - 9

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

training equipments for technical institutes.

- D) Vi Microsystems Pvt. Ltd., was started in the year 1986, with a prime motto to design and develop hardware and software products to keep in tune with the developing technology in the field of Electronics, and also to offer good sales support with effective service backup, powerful R&D and technical support.
- E) AITS Kadapa & Vi Microsystems believe that collaboration and co-operation between themselves will promote more effective use of each of their resources, and provide each of them with enhanced opportunities.
- F) The Parties intent to cooperate and focus their efforts on cooperation within area of Skill Based Training, Education and Research and any other areas upon mutual consent.

NOW THEREFORE, IN CONSIDERATION OF THE MUTUAL PROMISES SET FORTH IN THIS MoU, THE PARTIES HERE TO AGREE AS FOLLOWS:

CLAUSE 1: CO-OPERATION

- 1.1 Both Parties are united by common interests and objectives, and they shall establish channels of communication and co-operation that will promote and advance their respective operations within the Institution and its related wings.
- 1.2 AITS Kadapa and Vi Microsystems co-operation will facilitate effective utilization of the intellectual capabilities of the faculty of AITS Kadapa providing significant inputs to them in developing suitable teaching/training and research systems, keeping in mind the needs of the industry.
- 1.3 The general terms of co-operation shall be governed by this MoU. The Parties shall cooperate with each other and shall, as promptly as reasonably practical, enter into all relevant agreements, deeds and documents (the 'Definitive Documents') as may be required to give effect to the actions contemplated in terms of this MoU. The term of Definitive Documents shall be mutually decided between the Parties.

CLAUSE 2: SCOPE OF THE MoU

- 2.1 Both parties believe that close co-operation between the two would be of major benefit to the student community to enhance their skills and knowledge. The following areas are covered under this MoU for engagement and cooperation for the benefit of the student community:



Aravind

PRINCIPAL VI Microsystems Pvt. L
ANNAMACHARYA INSTITUTE OF Electronics Estate,
Dennurli, Chennai - 96

- a. Industrial Training and Visits
 - b. Internships for Students
 - c. Research and Development
 - d. Skill Development Programs
- 2.2 **Industrial Training & Visits:** Industry and Institution interaction will give an insight into the latest developments/requirements of the industries; Vi Microsystems shall arrange for the Faculty and Students of AITS Kadapa to visit its associated companies and also involve in Industrial Training Programs for AITS Kadapa. The industrial training and exposure provided to students and faculty through this association will build confidence and prepare the students to have a smooth transition from academic to working career. Vi Microsystems will provide its Labs/Workshops/Industrial Sites for the hands-on training of the learners enrolled with AITS Kadapa.
- 2.3 **Internships for Students:** Vi Microsystems will actively engage to help the delivery of the internship and placement of students of AITS Kadapa into Internships/jobs, as per AICTE internship Policy. It will also register itself on AICTE Internship Policy Portal for disseminating the Internship opportunities available with them.
- 2.4 **Research and Development:** Both Parties have agreed to carry out the joint research activities in the fields of Skill Development, Education and R&D Services in the fields of - Innovative Manufacturing process and Maintenance Services.
- 2.5 **Skill Development Programs:** Vi Microsystems to engage in training the students of AITS Kadapa on the emerging technologies in order to bridge the skill gap and make them industry ready..
- 2.6 Both Parties to obtain all internal approvals, consents, permissions, and licenses of what so ever nature required for offering the Programs on the terms specified herein.
- 2.7 There is no financial commitment on the part of the AITS Kadapa, the First Party to take up any program mentioned in the MoU. If there is any financial consideration, It will be dealt separately and upon mutual consent.

CLAUSE 3: INTELLECTUAL PROPERTY

- 3.1 Nothing contained in this MoU shall, by express grant, implication, Estoppel or otherwise, create in either Party any right, title, interest, or license in or to



Adarsh
PRINCIPAL

Vi Microsystems Pvt. Ltd.
76, Electronics Estate,
Perungudi, Chennai - 06

the intellectual property (including but not limited to know-how, inventions, patents, copy rights and designs) of the other Party.

- 3.2 Each Party agrees and acknowledges that all the copyrights, trademarks, proprietary and/or licensed software, service marks and trade secrets of each Party while conducting the business contemplated under this MoU shall always belong to such respective Party.
- 3.3 Protect the confidential information and IPRs in a reasonable and appropriate manner as prescribed under law and in accordance with the applicable professional standards.
- 3.4 Use confidential information and IPRs only to perform obligation under this arrangement; and reproduce confidential information and IPRs only as required to perform its obligations under this arrangement.
- 3.5 This clause shall survive and continue even after the termination of the MoU.

CLAUSE 4: VALIDITY

4. This MoU is valid for a period of five years and can be extended further by mutual approval and agreement

CLAUSE 5: RELATIONSHIP BETWEEN THE PARTIES

- 5.1 It is expressly agreed that AITS Kadapa and VI Microsystems are acting under this MoU as independent contractors, and the relationship established under this MoU shall not be construed as a partnership. Neither Party is authorized to use the other Party's name in any way, to make any representations or create any obligation or liability, expressed or implied, on behalf of the other Party, without the prior written consent of the other Party.

Neither Party shall have, nor represent itself as having, any authority under the terms of this MoU to make agreements of any kind in the name of or binding upon the other Party, to pledge the other Party's credit, or to extend credit on behalf of the other Party.


**Annamacharya Institute of Technology
& Sciences, Kadapa**

**VI Microsystems Pvt. Ltd.,
75, Electronics Estate,
Perungudi, Chennai - 96**

**VI Microsystems Pvt. Ltd.,
Chennai**

Any divergence or difference derived from the interpretation or



**PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES**

application of the MoU shall be resolved by arbitration between the parties as per the Arbitration Act, 1996. The place of the arbitration shall be at District Head Quarters of AITS Kadapa. This undertaking is to be construed in accordance with Indian Law with exclusive jurisdiction in the Courts of **Kadapa**.

AGREED: Vi Microsystems Pvt. Ltd.,
75, Electronics Estate,
Perungudi, Chennai - 96

For **Annamacharya Institute of
Technology & Sciences
Kadapa**

For **Vi Microsystems Pvt. Ltd.
Chennai**

Authorized Signatory
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M)
KADAPA 516 003. (A.P.)

Authorized Signatory

Annamacharya Institute of Technology & Sciences	Vi Microsystems Pvt.Ltd.
Utukur (P), C.K. Dinne (V & M), YSR Kadapa District, A.P. 516 003	75, Electronics Estate, Perungudi, Chennai - 600 096.
9603999591	044 - 2496 1852
aitskadapa@gmail.com	sales.info@vimicrosystems.com
www.aitskadapa.ac.in	www.vimicrosystems.com

Witness1:

Witness1:

Witness2:

Witness2:

ASREDDY
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

FACILITIES AGREEMENT

THIS FACILITIES AGREEMENT ("this Agreement") is made effective as of the Effective Date (specified in Schedule 1) by and between **Consultancy Services Limited**, a company incorporated under the Companies Act 1956, with its corporate office located at Raveline Street, 21 D. S. Marg, Fort, Mumbai 400001, hereinafter referred as 'TCS' (which expression shall include its successors and the Party specified in the Schedule 1 to this Agreement hereinafter referred as a 'LISP' (which expressions shall, unless the context otherwise, includes its successors and permitted assigns) for end to end infrastructural support for work as defined in the Scope below. In this Agreement, TCS and LISP are collectively referred as "Parties" and individually as a "Party".

WHEREAS:

- a) TCS has certain shared software applications ("TCS Application System") which will be accessed/used by its customers ("Service Customers")
- b) TCS needs certain infrastructure and facilities for delivering the Services to its Customer(s) effectively and LISP agreed to provide such infrastructure and Facilities ("Facilities");

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. Definitions:-

"Authorized Personnel" means only those individuals (working for and on behalf of TCS), who have a bona fide need to have access to Facilities in connection with the use of Services by Customer under this Agreement.

"Confidential Information" shall mean and include all business strategies, plans and procedures, proprietary information, software program, documentation, tools, processes, methodologies, data and trade secrets, information relating to customers, employees, or business partners, and any other confidential or proprietary information and materials of the Disclosing Party, its affiliates, clients or suppliers that may be received or obtained by the Receiving Party as a result of this Agreement.

"Customer" shall mean the customer or customers of TCS to whom TCS is required to render Services from or using the Facilities.

"Facilities" shall mean the facilities as set out in Clause 1 on Schedule 2

"LISP" shall mean Local Infrastructure Service Provider -

"Location" shall mean the locations or places of the LISP as specified in Schedule 1 where the Facilities shall be made available to TCS.

"LISP Hardware" shall mean the hardware listed in Clause 2 in Schedule 2 and made available by the LISP to TCS for use during the Usage Period communicated by TCS.

"Term" shall mean the term as set out in the Schedule 1.

"Usage Period" - For LISP Hardware, it is the period when TCS shall utilize the Facilities for its business requirement which shall be notified under the relevant Work Order by TCS to the LISP. In case of a change in the Usage Period, such revised Usage Period shall be notified by TCS from time to time through a written notice to the LISP.

Scope of Service:-TCS requires an end to end infrastructural support to use the Facilities as set out in Clause 1 of Schedule 2 during the Usage Period for the Term of this Agreement. This Agreement is to ensure outsourcing of the work for conduct of the exam however the consideration for the same is being determined on usage basis of the facilities used as per Clause 3 in Schedule 2. From time to time TCS shall notify the LISP of its requirement to use the Facilities prior to the commencement of the Usage Period. This will be done by TCS by issuing specific Work Orders. Facilities shall be made available for exclusive use of TCS during the Usage Period as communicated by TCS. TCS has the right to postpone the Usage Period which shall be notified to the LISP as stated in this Agreement. LISP understands and agrees that time is of the

essence of this Agreement and in the event of non-availability of Facilities during Usage Period; TCS and its Customers shall bear the irreparable loss and damage both financial and reputational. LISP acknowledges that LISP shall make good such loss suffered by TCS and its Customers.

2. Term and Renewal:-This Agreement is effective during the term as set out in Schedule 1 unless terminated earlier in accordance with the provisions of this Agreement.

3. Obligations of the LISP:- LISP shall make the Facilities in working condition to TCS for the Usage Period throughout the Term. LISP shall allow free access to TCS and the Facilities to TCS and its Customers and shall operate with TCS to enable TCS to render Services to its Customers. LISP shall also ensure that Location is free of disturbance and is using the same. In the event, the LISP has agreed to provide personnel as part of Facilities; the LISP shall ensure that such personnel have necessary expertise as required by TCS and shall ensure that the power supply and its back up in form of generator is available and is in working condition throughout the Usage Period. Availability of fuel, back up electrical cables, electrician, Schedule 2 of this Agreement. LISP shall ensure that networked and network connectivity is available at the Location mentioned in Schedule 3. LISP shall, at all times, ensure that applicable Facilities and/or Location related statutory regulations or policies including confidentiality and other under this Agreement. LISP shall also procure and obtain required approvals, permission, consent throughout the Usage Period. LISP shall also obtain written consent from TCS before undertaking any maintenance activity with respect to Facilities which may jeopardize the timelines as stated in the Work Order. TCS shall notify the LISP. LISP shall also on regular intervals required by TCS or by applicable statutory authorities for compliance with all applicable laws, regulations or any such approvals, permission, consents. LISP shall ensure that Facilities are available for exclusive use by TCS during the Usage Period.

4. Fees:- TCS shall pay Fees to LISP as per Clause 3 in Schedule 2 after deduction of applicable tax at source (TDS) and certificate in prescribed format for such deduction. All payments under this Agreement shall be exclusive of applicable taxes.

5. Representation and Warranties:- Each Party represents and warrants to the other that: (i) it is duly incorporated and validly existing and in good standing under the laws of India and shall comply with all applicable Laws; (ii) it has the authority to enter into this Agreement and to perform its obligations (including providing Facilities) under this Agreement; (iii) that this Agreement constitutes a legal, valid and binding contract and (iii) its execution, delivery and performance of this Agreement does not and will not conflict with, or constitute a breach of, its charter of organization, or any contract or obligation to which it is a party. Further, LISP warrants that all facilities provided as per Schedule 2 are in working conditions throughout the Usage Period.



charges, taxes etc with respect to Facilities provided to TCS and shall be liable to pay any such applicable fees, charges, taxes etc during the term of this Agreement. LISP shall indemnify, defend and hold harmless TCS and the Customer from and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever nature arising or resulting from breach of the aforesaid warranties or from the violation of any laws, rules, regulations or statutory requirements.

6. Limitation of Liability:- TCS shall not be liable to the LISP for any special, indirect, incidental, consequential (including loss of revenue and/or profit), exemplary or punitive damages, whether in contract, tort or other theories of law, even if TCS has been advised of the possibility of such damages. The total cumulative liability of TCS under this Agreement shall not exceed in aggregate the amount paid by TCS to the LISP under this Agreement.

7. Confidential Information:- Each Party receiving the Confidential Information (the "Receiving Party") acknowledges and agrees to maintain the confidentiality of Confidential Information provided by the other Party (the "Disclosing Party") hereunder. The Receiving Party shall not disclose or disseminate the Disclosing Party's Confidential Information to any person other than those employees, agents, contractors, subcontractors and licensees of the Receiving Party, or its affiliates, who have a need to know it in order to assist the Receiving Party in performing its obligations, or to permit the Receiving Party to exercise its rights under this Agreement. The provisions of this Clause with respect to Confidential Information shall not apply to the extent, that such Confidential Information is: (a) already known to the Receiving Party free of any restriction at the time it is obtained from the Disclosing Party, (b) subsequently learned from an independent third party free of any restriction and without breach of this provision; (c) is or becomes publicly available through no wrongful act of the Receiving Party or any third party; (d) is independently developed by the Receiving Party without reference to or use of any Confidential Information of the Disclosing Party; or (e) is required to be disclosed pursuant to an applicable law, rule, regulation, government requirement or court order, or the rules of any stock exchange. Upon the Disclosing Party's written request at any time, or following the completion or termination of this Agreement, the Receiving Party shall promptly return to the Disclosing Party, or destroy, all Confidential Information of the Disclosing Party provided under or in connection with this Agreement, including all copies, portions and summaries thereof.

8. Intellectual Property Rights:- LISP agrees that TCS Application System, deliverables and work products created or developed by TCS or its employees, representatives etc. using TCS Application System and/or Facilities under this Agreement, together with any associated copyright and other intellectual property rights, shall be the sole and exclusive property of TCS. TCS is allowed to use the name and address of the LISP which may be necessary to render the Services to its Customers.

9. Termination :- (10.1) Termination for convenience b is entitled to terminate this Agreement by giving fifteen (15) written notice to the LISP. It is acknowledged and agreed Parties that LISP does not have right to terminate this Agreement for convenience. In the event if LISP terminates this agreement for convenience, the same shall be construed as material breach and TCS shall have the right to claim appropriate under the Law and this contract.

(10.2) Termination for Material Breach. Either Party may terminate this Agreement immediately by a written notice to the other event of a material breach which is not cured within thirty receipt of the said notice period. Failure of LISP to abide by Levels and denial of access by LISP to TCS on the Facility termed as material breach and the Agreement shall immediately terminated by TCS.

(10.3) Effect of termination. Either party shall return to other party's confidential and proprietary information in its possession. LISP agrees that in the event of expiry or of this Agreement for any reason, any accepted and unexecuted Order shall be executed by the LISP and all the obligations Work Order shall be performed by the LISP.

10. Miscellaneous:- (11.1) Independent Contract Assignment. LISP shall not assign or transfer this Agreement obligations hereunder to any third party, without the prior consent of TCS.

(11.2) Change Request: Any changes to this Agreement in the form of change order ("Change Request") as attached 4 and shall be signed by both Parties.

(11.3) Governing Law, Dispute Resolution and Jurisdiction. This Agreement shall be governed by and interpreted in accordance with the laws of India. All disputes arising between the Parties under this Agreement shall be referred for arbitration to a sole Arbitrator mutually agreed upon and proceedings shall be governed by the Arbitration and Conciliation Act 1996. The venue of arbitration shall be Mumbai. Subject to arbitration, the Mumbai shall have exclusive jurisdiction.

(11.4) Entire Agreement. This Agreement sets forth the entire understanding of the Parties and supersedes all prior agreements and understandings between the Parties, with respect to the subject matter hereof.

(11.5) Notice:- Any notice in connection with this Agreement shall be in writing in English and delivered by hand, facsimile, registered post or courier of India to the address mentioned in the introduction clause c and address as may be informed to each other in writing by the

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized representatives

Annamacharya Institute of Technology & Sciences, Kadapa

By: _____

Name: Dr. A SUDHAKARA REDDY

Title: Principal

TATA Consultancy Services Ltd.

By: _____

Name: Mr. Venkateswamy Ramaswamy

Title: Global Head - TCS ION

SCHEDULE 1

TERMS OF AGREEMENT

<u>LISP Name</u>	<u>Invoicing Entity</u>	<u>Registered office address</u>	<u>Details of contact person</u>	<u>Location Name</u>
Annamacharya Institute of Technology & Sciences, Kadapa	The Principal AITS Examination Ac	UTUKUR POST, CHINTHAKOMMA DINNE VILLAGE & MANDAL, Y.S.R DISTRICT, KADAPA, A.P. 515003	Mr.Ghouse Mohiddin Asst. Professor ghouse05209@gmail.com 9032713716	Kadapa

<u>Contract Term</u>	<u>Effective Date</u>
3 years from Effective Date	06-Jul-2015

A. Ghouse

PRINCIPAL
ANNAMACHARYA INSITUTE OF
TECHNOLOGY & SCIENCES
G.K. DINNE (V&M)
KADAPA - 515 003. (A.P.)



SCHEDULE 2

1. Facilities: Facilities shall be inclusive but not limited to the following listed:

a. General Facilities

- i. Furnished IT lab/s with furniture,
- ii. Air-conditioned server & UPS room
- iii. First Aid
- iv. Fire Extinguishers
- v. Drinking water
- vi. Cafeteria
- vii. Rest Rooms and Toilets
- viii. Housekeeping staff (including but not limited to Sweepers, Peons, Security Guards, Electricians, Technicians, etc.)

b. Diesel Generator Facilities

- i. Dedicated Diesel Generator (DG) supply to the Facilities of a standard make which is supported by AMC and service certificate at all times

c. Assessment Support:

- i. As per TCS requirement, LISP will arrange for required assessment support by designating personnel in role of Administrator, Invigilators, Lab technicians, Security Guards, etc. as derived and determined by TCS and/or its Authorized Personnel shall validate and pay for such invigilation /supervision service as rates specified in point 3 (c) of Schedule 2. The LISP shall share the details of such personnel providing invigilation/supervision service with TCS and/or its Authorized Personnel as and when required

- ii. LISP will provide furnished IT lab with furniture, air-conditioned server room & UPS room, dedicated DG supply.

2. LISP Hardware:

Based on requirements of TCS, as per Work Order (as per 5 (a) below), including but not limited to the following as applicable

- a. Computer Nodes (Per Node Contracted and Used Per Session)
- b. LAN Facility
- c. Surveillance Camera facility to record a session based on TCS requirement-
- d. Recording media (CD/ DVD)
- e. Webcam for registration based on TCS requirement
- f. Internet Connectivity (with at least broadband connectivity)
- g. Laser / Ink Jet Printer (Per Unit)
- h. Printer with printing paper
- i. UPS
- j. Generator back Up

3. Fees:

a. TCS shall pay Fees only for LISP Hardware for nodes as specified in the Work Order

b. The rate per node shall be determined basis "Category" as specified in Work Order. Various Categories are listed below:

Category	Number of Shifts	Personnel and Miscellaneous Cost	Rate per Node- LISP Hardware
C1	One Shift	Excluded	40
CB2	Two Shift	Included	120
CB3	Three Shift	Included	150
CB4	Four Shift	Included	165



A. Sreedhar
PRINCIPAL
HARYA INSTITUTE OF TECHNOLOGY



c. During Usage Period for personnel engaged and if the cost of the same is not included as per above defined rates then LISP shall be entitled to charge TCS for actual number of personnel engaged at the following agreed rates:

Sr. No.	Personnel Description	Single Shift Price
1	Test Centre Administrator	Rs. 750 per shift
2	IT Managers	Rs. 600 per shift
4	Invigilators	Rs. 500 per shift
5	Support	Rs. 300 per shift

d. Other Reimbursements : Basis of actual utilization LISP is entitled to charge TCS for reimbursements of expenses on actual spend as defined below :

#	Description	Price
1	Surveillance Camera facility to record a session	Rs. 10 per node per day
2	Print Per Sheet	Rs. 1 per sheet

e. Diesel Generator Cost: Basis of actual utilization LISP will charge TCS for reimbursement of diesel expenses for proportionate DG usage (i.e. period utilized, load shared, etc.) at rates specified below.

Sr. No.	Description	Rate
1	Diesel Cost	Rs. 500 per hour

4. Miscellaneous:

- a. TCS will raise a Work order whenever TCS wants to use LISP hardware and LISP shall raise invoice after the Usage Period. LISP shall attach a copy of the Work Order and supporting documents along with the invoice. TCS shall verify the invoice and pay a validated invoice within thirty (30) days from the date of receipt of original hard copy of the invoice on best effort basis.

SCHEDULE - 3 SERVICE LEVEL CREDITS

- LISP shall provide confirmation of center within 24 hours of receiving Work Order from TCS personnel
- LISP shall ensure that the details of personnel providing invigilation/supervision service are shared with TCS personnel 10 days prior to the period specified in Work Order
- LISP shall ensure that the invoices are dispatched immediately after completion of the project as stated in Work Order.



A. Broddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. DINNE (V&M)
KADAPA - 515 003



SCHEDULE 4
CHANGE REQUEST

No change to any Scope of Services shall be binding on the Parties unless the Change Request to the Facilities Agreement dated _____ ('Facilities Agreement') has been signed by authorized representatives of each party.

Change Request
No.: _____

Date Initiated: _____ Initiated by - _____

The following changes to the schedules to the Facilities Agreement are hereby approved by both the parties.

Description of Change:

Following are the changes/additions agreed to:

- a) Schedule 1
- b) Schedule 2
- c) Schedule 4

Approved

Tata Consultancy Services Limited

Authorized Signatory

Date

LISP

Authorized Signatory

Date



Aswathy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
6 C.K. DINNE (V&M)
KADAPA - 516 003 (A.P.)

1388/11
5-1
FACILITIES AGREEMENT

THIS FACILITIES AGREEMENT ("this Agreement") is made effective as of the Effective Date (specified in Schedule 1) by a Consultancy Services Limited, a company incorporated under the Companies Act 1956, with its corporate office located at TCS House 21 D S. Marg, Fort, Mumbai 400001, hereinafter referred as 'TCS' (which expression shall include its successors and assigns) and the Schedule 1 to this Agreement hereinafter referred as a 'LISP' (which expressions shall, unless the context requires otherwise, include and permitted assigns) for end to end infrastructural support for work as defined in the Scope of Services below. In this Agreement, collectively referred as "Parties" and individually as a "Party".

WHEREAS:

- a) TCS has certain shared software applications ("TCS Application System") which will be accessed/used by its customers ("Services")
- b) TCS needs certain infrastructure and facilities for delivering the Services to its Customer(s) effectively and LISP agreed to provide said Facilities ("Facilities");

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. Definitions:-

"Authorized Personnel" means only those individuals (working for and on behalf of TCS), who have a bona fide need to have access to Facilities in connection with the use of Services by Customer under this Agreement.

"Confidential Information" shall mean and include all business strategies, plans and procedures, proprietary information, software program, documentation, tools, processes, methodologies, data and trade secrets, information relating to customers, employees, or business partners, and any other confidential or proprietary information and materials of the Disclosing Party, its affiliates, clients or suppliers that may be received or obtained by the Receiving Party as a result of this Agreement.

"Customer" shall mean the customer or customers of TCS to whom TCS is required to render Services from or using the Facilities.

"Facilities" shall mean the facilities as set out in Clause 1 on Schedule 2.

"LISP" shall mean Local Infrastructure Service Provider.

"Location" shall mean the locations or places of the LISP as specified in Schedule 1 where the Facilities shall be made available to TCS.

"LISP Hardware" shall mean the hardware listed in Clause 2 in Schedule 2 and made available by the LISP to TCS for use during the Usage Period communicated by TCS.

"Term" shall mean the term as set out in the Schedule 1.

"Usage Period" - For LISP Hardware, it is the period when TCS shall utilize the Facilities for its business requirement which shall be notified under the relevant Work Order by TCS to the LISP. In case of a change in the Usage Period, such revised Usage Period shall be notified by TCS from time to time through a written notice to the LISP.

Scope of Service:- TCS requires an end to end infrastructural support to use the Facilities as set out in Clause 1 of Schedule 2 during the Usage Period for the Term of this Agreement. This Agreement is to ensure outsourcing of the work for conduct of the exam however the consideration for the same is being determined on usage basis of the facilities used as per Clause 3 in Schedule 2. From time to time TCS shall notify the LISP of its requirement to use the Facilities prior to the commencement of the Usage Period. This will be done by TCS by issuing specific Work Orders. Facilities shall be made available for exclusive use of TCS during the Usage Period as communicated by TCS. TCS has the right to postpone the Usage Period which shall be notified to the LISP as stated in this Agreement. LISP understands and agrees that time is of the essence of this Agreement and in the event of non-availability of the Facilities during Usage Period; TCS and its Customers would incur irreparable loss and damage both financial and reputational. LISP acknowledges that LISP shall make good such loss suffered by TCS and its Customers.

2. Term and Renewal:- This Agreement is effective as set out in Schedule 1 unless terminated earlier in accordance with provisions of this Agreement.

3. Obligations of the LISP:- LISP shall ensure Facilities in working condition to TCS for the Usage Period. LISP shall allow free access to the Locations to TCS and its Customers and shall assist and co-operate to enable TCS to render Services to its Customers. LISP shall ensure that Location is free of disturbance while TCS is using the same. In the event, the LISP has agreed to provide personnel as per Clause 3 of this Agreement, LISP shall ensure that such personnel have necessary resources required by TCS. LISP shall ensure that the power supply in form of diesel generator is available and is in working condition with availability of fuel, back up electrical cables, etc. as per Schedule 2 of this Agreement. LISP shall ensure that networked and network connectivity is available at all times as set out in Schedule 3. LISP shall, at all times, comply with all applicable laws and/or Location related statutory laws, rules, regulations, including confidentiality and other obligations under the same. LISP shall also procure and maintain all required approval consent throughout the term of this Agreement. LISP shall obtain written consent from TCS before undertaking any work with respect to Facilities which may jeopardize the term of the Work Order issued by TCS to the LISP. LISP shall ensure periodic intervals and/or when required by TCS or by a regulatory authority provide proof for compliance with all applicable laws or policies and any such approvals, etc. LISP shall maintain the Facilities for exclusive use of TCS during the Usage Period.

4. Fees:- TCS shall pay Fees to LISP as per Clause 2 after deduction of applicable tax at source (TDS) certificate in prescribed format for such deduction. All payments under this Agreement shall be exclusive of applicable indirect taxes.

5. Representation and Warranties:- Each Party represents and covenants to the other that: (i) it is duly organized and in good standing under the laws of the country in which it is incorporated; (ii) it has the full right and authority to enter into this Agreement and to perform all the obligations under this Agreement and that this Agreement is a legal, valid and binding obligation; and (iii) its performance of this Agreement does not and will not constitute a breach or default under, its charter or any contract or other instrument to which it is a party. Further, each Party warrants that all the Facilities provided as per Schedule 2 are in working condition throughout the Term and in the event they are not in working condition, LISP shall get it repaired at its own cost. LISP warrants that it shall pay applicable fees, charges, taxes etc. with respect to the use of Facilities. TCS and shall be liable to pay any such applicable taxes, etc. during the term of this Agreement. LISP shall hold harmless TCS and the Customer from and against all liabilities, damages, claims, fines, penalties, and expenses of any nature arising or resulting from breach of the above stated obligations or violation of any laws, rules, regulations or statutory provisions.

6. Limitation of Liability:- TCS shall not be liable for any special, indirect, incidental, consequential damages.



revenue and/or profit), exemplary or punitive damages, whether in contract, tort or other theories of law, even if TCS has been advised of the possibility of such damages. The total cumulative liability of TCS under this Agreement shall not exceed in aggregate the amount paid by TCS to the LISP under this Agreement.

7. **Confidential Information:** - Each Party receiving the Confidential Information (the "Receiving Party") acknowledges and agrees to maintain the confidentiality of Confidential Information provided by the other Party (the "Disclosing Party") hereunder. The Receiving Party shall not disclose or disseminate the Disclosing Party's Confidential Information to any person other than those employees, agents, contractors, subcontractors and licensees of the Receiving Party, or its affiliates, who have a need to know it in order to assist the Receiving Party in performing its obligations, or to permit the Receiving Party to exercise its rights under this Agreement. The provisions of this Clause with respect to Confidential Information shall not apply to the extent that such Confidential Information is: (a) already known to the Receiving Party free of any restriction at the time it is obtained from the Disclosing Party; (b) subsequently learned from an independent third party free of any restriction and without breach of this provision; (c) is or becomes publicly available through no wrongful act of the Receiving Party or any third party; (d) is independently developed by the Receiving Party without reference to or use of any Confidential Information of the Disclosing Party; or (e) is required to be disclosed pursuant to an applicable law, rule, regulation, government requirement or court order, or the rules of any stock exchange. Upon the Disclosing Party's written request at any time, or following the completion or termination of this Agreement, the Receiving Party shall promptly return to the Disclosing Party, or destroy, all Confidential Information of the Disclosing Party provided under or in connection with this Agreement, including all copies, portions and summaries thereof.

8. **Intellectual Property Rights:** - LISP agrees that TCS Application System, deliverables and work products created or developed by TCS or its employees, representatives etc. using TCS Application System and/or Facilities under this Agreement, together with any associated copyright and other intellectual property rights, shall be the sole and exclusive property of TCS. TCS is allowed to use the name and address of the LISP which may be necessary to render the Services to its Customers.

9. **Termination:** - (9.1) **Termination for convenience by TCS.** TCS is entitled to terminate this Agreement by giving fifteen (15) days prior written notice to the LISP. It is acknowledged and agreed between the Parties that LISP does not have right to terminate this Agreement for convenience. In the event if LISP terminates this agreement for convenience, the same shall be construed as material breach of this Agreement and TCS shall have the right to claim appropriate damages under the Law and this contract.

(9.2) **Termination for Material Breach.** Either Party may terminate this Agreement immediately by a written notice to the other Party in the event of a material breach which is not cured within thirty days of the receipt of the said notice period. Failure of LISP to abide by the Service Levels and

Denial of access by LISP to TCS on the Facilities shall material breach and the Agreement shall immediately be TCS.

(9.3) **Effect of Termination.** Either party shall return to the other party's confidential and proprietary information and possession. LISP agrees that in the event of expiry or termination of this Agreement for any reason, any accepted and unexecuted orders shall be executed by the LISP and all the obligations under this Agreement shall be performed by the LISP.

10. **Miscellaneous:** - (10.1) **Independent Contractors.** The LISP shall not assign or transfer this Agreement or a part hereunder to any third party, without the prior written consent of TCS.

(10.2) **Change Request:** Any changes to this Agreement in the form of change order ("Change Request") as attached in S shall be signed by both Parties.

(10.3) **Government Law, Dispute Resolution and Jurisdiction.** This Agreement shall be governed by and interpreted in accordance with the laws of India. All disputes arising between the Parties under this Agreement shall be referred for arbitration to a sole Arbitrator mutually agreed upon and proceedings shall be governed by the Arbitration and Conciliation Act 1996. The venue and seat of arbitration shall be Mumbai. Subject to arbitration, the courts in Mumbai shall have exclusive jurisdiction.

(10.4) **TCS Supplier Code of Conduct:** The business engaged with the LISP is regulated by the TCS Supplier Code of Conduct. All agencies dealing with TCS like the LISP herein are also bound by the said Code and shall promptly inform TCS of any threatened breach of the Code by any person by informing the TCS, in turn, undertakes that it will maintain confidential communication received. Violations and concerns can be reported confidentially via email to corporate.ethics@tcs.com. The Code of Conduct can be viewed at http://www.tcs.com/sitecollection/document/tcs/tcs_service_provider_code_conduct.

(10.5) **Entire Agreement.** This Agreement sets forth the entire understanding of the Parties and supersedes all prior agreements and understandings between the Parties, with respect to the subject matter hereof.

(10.6) **Notice:** - Any notice in connection with this Agreement shall be written in English and delivered by hand, facsimile, email or registered post or courier of international address mentioned in the introduction clause or any other method mutually agreed to in writing by both Parties.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized representatives

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES

By: Dr. A. Sudhekar Reddy

Name: Dr. A. Sudhekar Reddy

Title: Principal

PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

TCS Proprietary and Confidential

TATA Consultancy Services Ltd.

By: Mr. Venugowamy Ramiswamy

Name: Mr. Venugowamy Ramiswamy

Title: Global Head - TCS ION



SCHEDULE 1
TERMS OF AGREEMENT

<u>LISP Name</u>	<u>Invoicing Entity</u>	<u>Registered office address</u>	<u>Authorized Signatory Details</u>	<u>Details of Contact Person</u>	<u>Location Name</u>
Annamacharya Institute of Technology and Sciences	The Principal AITS Examination Ac	Kethanakonda Village, Ibrahimpatnam Mandal, Krishna District, Kanchilacherla, Andhra Pradesh-521456	Dr. A Sudhakara Reddy Principal	Mr. P Anjaneya Asst. Professor anjaneya04071989@gmail.com 9949388195	Kadapa

<u>Contract Term</u>	<u>Effective Date</u>
3 years from Effective Date	01-08-2017



A. Brachy



SCHEDULE 2

1. Facilities: Facilities shall be inclusive but not limited to the following listed:

a. General Facilities

- i. Furnished IT lab/s with furniture,
- ii. Air-conditioned server & UPS room
- iii. First Aid
- iv. Fire Extinguishers.
- v. Drinking water
- vi. Cafeteria
- vii. Rest Rooms and Toilets
- viii. Housekeeping staff (including but not limited to Sweepers, Peons, Security Guards, Electricians, Technicians, etc.)

b. Diesel Generator Facilities

- i. Dedicated Diesel Generator (DG) supply to the Facilities of a standard make which is supported by AMC and service certificate at all times

c. Assessment Support:

- i. As per TCS requirement, LISP will arrange for required assessment support by designating personnel role of Administrator, Invigilators, Lab technicians, Security Guards, etc. as derived and determined by TCS and/or its Authorized Personnel shall validate and pay for such invigilation /supervision service at rates specified in point 3 (c) of Schedule 2. The LISP shall share the details of such personnel provide invigilation/supervision service with TCS and/or its Authorized Personnel as and when required.
- ii. LISP will provide furnished IT lab with furniture, air-conditioned server room & UPS room, dedicated supply.

2. LISP Hardware:

Based on requirements of TCS, as per Work Order, including but not limited to the following as applicable:

- a. Computer Nodes (Per Node Contracted and Used Per Session)
- b. LAN Facility
- c. Surveillance Camera facility to record a session based on TCS requirement-
- d. Recording media (CD/ DVD)
- e. Webcam for registration based on TCS requirement
- f. Internet Connectivity (with at least broadband connectivity)
- g. Laser / Ink Jet Printer (Per Unit)
- h. Printer with printing paper
- i. UPS
- j. Generator back Up



3. Fees:

- a. TCS shall pay Fees only for LISP Hardware for nodes at Rs. 50 per node per day for the highest number of used by TCS on the particular day. In case LISP centre is not available as per the requirement of TCS, TCS reserves the right to proportionately reduce the node rate basis the number of hours for which LISP has made the available.
- b. During Usage Period for personnel engaged and if the cost of the same is not included as per above defined then LISP shall be entitled to charge TCS for actual number of personnel engaged at the following agreed rates:

Sr. No.	Personnel Description	Single Shift Price	Two Shift Price	Three Shifts Price	For
1	Test centre Administrator	Rs.750 per shift	Rs.1125 per day	Rs.1500 per day	R
2	IT Managers	Rs.750 per shift	Rs.1125 per day	Rs.1500 per day	R
3	IT Assistants	Rs.400 per shift	Rs.600 per day	Rs.800 per day	R
4	Invigilators	Rs.500 per shift	Rs.750 per day	Rs.1000 per day	R
5	Support	Rs.300 per shift	Rs.450 per day	Rs.600 per day	R

TCS/ its Service Provider shall pay the aforesaid charges basis actual invoice received from the LISP.

- c. Other Reimbursements : Basis of actual utilization LISP is entitled to charge TCS for reimbursements of expenses actual spend as defined below :

#	Description	Price
1	Surveillance Camera facility to record a session	Rs.10 per node per day
2	Print Per Sheet	Rs. 1 per sheet

- d. Diesel Generator Cost: LISP will charge TCS for reimbursement of diesel expenses for the DG usage at rates below:

Sr. No.	Description	Rate
1	Diesel Cost	Rs. 4.5 per candidate

Number of Shift	Single Shift	Double Shift	3 or More Shift
Minimum Amount	Rs. 800	Rs. 1,500	Rs. 2,200

LISP shall be eligible for payout basis actual utilization (Diesel Cost per candidate * Number of registered candidates) or Minimum Amount whichever is higher.

On the day of the examination in case diesel generator fails and TCS is required to arrange for alternate diesel generator shall pay the actual expense incurred as follows:

- In case LISP has a valid invoice for which payment is due from TCS, LISP can raise a credit note against the valid invoice.
- In case LISP does not have a valid invoice, LISP shall raise a credit note along with cheque for the actual expense.

4. Miscellaneous:

- TCS will raise a Work order whenever TCS wants to use LISP hardware and LISP shall raise an undisputed invoice Usage Period within 60 days from the date of examination. LISP shall attach a copy of the Work Order and supporting documents along with the invoice. TCS shall verify the invoice and pay a validated invoice within thirty (30) days date of receipt of original hard copy of the invoice on best effort basis.
- In case TCS does not receive undisputed invoice within 60 days from the date of examination, TCS shall not be make payment to the LISP.

SCHEDULE - 3 SERVICE LEVEL CREDITS

- LISP shall provide confirmation of center within 24 hours of receiving Work Order from TCS personnel
- LISP shall ensure that the details of personnel providing invigilation/supervision service are shared with TCS personnel days prior to the period specified in Work Order
- LISP shall ensure that the invoices are dispatched immediately after completion of the project as stated in Work Order



PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY

SCHEDULE 4
CHANGE REQUEST

No change to any Scope of Services shall be binding on the Parties unless the Change Request to the Facilities Agreement dated _____ ('Facilities Agreement') has been signed by authorized representatives of each party.

Change Request
No.: _____

Date Initiated: _____ Initiated by - _____

The following changes to the schedules to the Facilities Agreement are hereby approved by both the parties.

Description of Change:

Following are the changes/additions agreed to:

- a) Schedule 1
- b) Schedule 2
- c) Schedule 4

Approved

Tata Consultancy Services Limited

Authorized Signatory

Date

LIGP

Authorized Signatory

Date



FACILITIES

INDIA NON JUDICIAL

ANDHRA PRADESH



Stamp Paper Six Hundred Only
Rs. 600

46705791907317645000 - 00001155

THIS FACILITIES AGREEMENT ("this Agreement") is made effective as of the Effective Date (specified in Schedule 1) by and between TCS Consultancy Services Limited, a company incorporated under the laws of India, with its corporate office located at TCS House, Ravel Street, 21 D. S. Marg, Fort, Mumbai 400001, hereinafter referred as 'TCS' (which expression shall include its successors and assigns) and Party specified in the Schedule 1 to this Agreement hereinafter referred as a 'LISP' (which expressions shall, unless the context require otherwise, includes its successors and permitted assigns) for end to end infrastructural support for work as defined in the Scope of Service below. In this Agreement, TCS and LISP are collectively referred as "Parties" and individually as a "Party".

WHEREAS:

- a) TCS has certain shared software applications ("TCS Application System") which will be accessed/used by its customers ("Services");
- b) TCS needs certain infrastructure and facilities for delivering the Services to its Customer(s) effectively and LISP agreed to provide such infrastructure and Facilities ("Facilities");

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. Definitions:-

"Authorized Personnel" means only those individuals (working for and on behalf of TCS), who have a bona fide need to have access Facilities in connection with the use of Services by Customer under this Agreement.

"Confidential Information" shall mean and include all business strategies, plans and procedures, proprietary information, software program documentation, tools, processes, methodologies, data and trade secrets, information relating to customers, employees, or business partners, or any other confidential or proprietary information and materials of the Disclosing Party, its affiliates, clients or suppliers that may be received obtained by the Receiving Party as a result of this Agreement.

"Customer" shall mean the customer or customers of TCS to whom TCS is required to render Services from or using the Facilities.

"Facilities" shall mean the facilities as set out in Clause 1 on Schedule 2

"LISP" shall mean Local Infrastructure LISP.

"Location" shall mean the locations or places of the LISP as specified in Schedule 1 where the Facilities shall be made available to TCS.

"LISP Hardware" shall mean the hardware listed in Clause 2 in Schedule 2 and made available by the LISP to TCS for use during the Usage Period communicated by TCS.

"Term" shall mean the term as set out in the Schedule 1.

"Usage Period" - For LISP Hardware, it is the period when TCS shall utilize the Facilities for its business requirement which shall be notified under the relevant Work Order by TCS to the LISP. In case of a change in the Usage Period, such revised Usage Period shall be notified by TCS from time to time through a written notice to the LISP.

Scope of Service:- TCS requires an end to end infrastructural support to use the Facilities as set out in Clause 1 of Schedule 2 during the Usage Period for the Term of this Agreement. This Agreement is to ensure outsourcing of the work for conduct of the exam however the consideration for the same is being determined on usage basis of the facilities used as per Clause 3 in Schedule 2. From time to time TCS shall notify the LISP of its requirement to use the Facilities prior to the commencement of the Usage Period. This will be done by TCS by issuing specific Work Orders. Facilities shall be made available for exclusive use of TCS during the Usage Period as communicated by TCS. TCS has the right to postpone the Usage Period which shall be notified to the LISP as stated in this Agreement. LISP understands and agrees that time of the essence of this Agreement and in the event of non-availability of the Facilities during Usage Period; TCS and its Customers would incur irreparable loss and damage both financial and reputational. LISP acknowledges that LISP shall make good such loss suffered by TCS and its Customers.

1. This Agreement is on a principal-to-principal basis between the Parties hereto. The LISP shall perform all the Services hereunder as an independent LISP and nothing contained herein shall be deemed to create any association, partnership, joint venture or relationship, principal and agent or master and servant or employer and employee between the Parties hereto or any affiliates thereof or to provide either Party with the right, power or authority, whether express or implied to create any such duty or obligation on behalf of the other Party. The LISP acknowledges that its rendering of the Services is solely within its own control subject to the terms and conditions agreed upon and agrees not to hold itself out to be an employee, agent or servant of TCS or affiliate thereof.
2. Term and Renewal:- This Agreement is effective during the Term as set out in Schedule 1 unless terminated earlier in accordance with the provisions of this Agreement.
3. Obligations of the LISP: -
 - a) LISP shall make available the Facilities in working condition to TCS for the Usage Period throughout the Term. LISP shall allow full access to the Location and the Facilities to TCS and its Customers and shall assist and co-operate with TCS to enable TCS to render Services to its Customers.



A. Reddy
PRINCIPAL

VVA INSTITUTE OF TECHNOLOGY

- b) LISP shall make available the Facilities for mock test and its related activities as and when required by TCS, at no additional cost. LISP shall also provide required support and manpower during such activity.
- c) LISP shall also ensure that Location is free of disturbance while TCS is using the same.
- d) LISP shall intimate TCS and submit fresh Background check report within 30 days, in case of any change in ownership, authorized signatory, bank details, GST, PAN Credentials or any other changes. LISP shall provide all the requisite documents as requested.
- e) In the event, the LISP has agreed to provide personnel as part of Facilities; the LISP shall ensure that such personnel have the expertise as required by TCS.
- f) LISP acknowledges that none of its personnel and / or LISP's authorized signatory shall - be involved in any exam complaints/malpractice and in case of any such instances are reported, then LISP shall be solely held liable and any serious may lead to FIR/Legal Proceedings against the personnel involved and the management of LISP.
- g) LISP shall ensure that the adequate power supply and its back up in form of Online UPS and diesel generator is available in working condition along with availability of fuel, back up electrical cables, electrician, as stated in Schedule 2 of this Agreement.
- h) LISP shall ensure that all nodes are networked connected through LAN based connection and network connectivity is available at all times as mentioned in Schedule -1.
- i) LISP shall, at all times, comply with all applicable Facilities and/or Location related statutory laws, rules, regulations or policies in relation to confidentiality and other obligations under this Agreement. LISP shall also procure and maintain all required approvals, permission or consent from statutory authorities throughout the term of this Agreement.
- j) LISP shall obtain written consent from TCS before undertaking any maintenance activity with respect to Facilities which may affect the timelines as stated in the Work Order issued by TCS to the LISP.
- k) LISP shall on regular intervals and/or when required by TCS or by applicable statutory authorities provide proof for compliance with applicable laws, regulations or policies and any such approvals, permission, consents.
- l) LISP shall maintain the Facilities for exclusive use by TCS during the Usage Period.
- m) LISP shall promptly notify TCS on becoming aware of any claim, accusation, notice of violation, demand, action, abatement or conditional or otherwise, which has been made against it or TCS or any director, secretary, manager or similar officer of either party in relation to this Agreement. LISP agrees to cooperate with and assist TCS in taking whatever action which TCS deems reasonable necessary or desirable to mitigate the delay or loss arising from such notice.
- n) LISP shall not knowingly engage any person with a criminal record/conviction or any person who has faced disciplinary action in previous employment and shall bar any such person from participating directly or indirectly in the provision of Services under this Agreement.
- o) LISP shall withdraw or bar any of its Personnel from the provision of the Services, at no additional cost to TCS, if in the sole opinion of TCS, the quality of Service rendered is not in accordance with the Scope of Service agreed between the Parties.
- p) LISP acknowledges that TCS is and will at all times be relying upon the LISP's expertise and judgment. Nothing in this Agreement obligates TCS or any person acting on behalf of TCS to carry out any inspection, review or approval of the Services and any action to inspect, review or approve the Services shall not in any way diminish any duty or liability of the LISP under or in connection with this Agreement.
- q) The LISP undertakes and agrees to supervise its staff assigned for the Services to ensure that it is conducted in accordance with the terms and conditions agreed upon between TCS and the LISP. The LISP shall be responsible for all matters relating to salaries and benefits for its Personnel, and shall be responsible for assessments and monitoring of performance and for all disciplinary matters relating to Personnel.
- r) The LISP shall keep or cause to be kept written records and reports of the progress of the Services and its activities in sufficient and in good scientific manner for all purposes for three (3) years from the date of expiry / termination of this Agreement; such records and other records clearly reflecting the Services and the results thereof. The LISP shall report completion of the Services to TCS in summary form in writing not less than thirty (30) days following the end of each month and in reasonable detail orally at such meetings as the Parties may agree to hold from time to time.
- s) The LISP hereby agrees that it shall comply with all applicable laws, ordinances, regulations in performing of its obligations under the Services hereunder, including the procurement of licenses, permits and certificates and payment of taxes where required. If at any time during the term of this Agreement, TCS is informed that the LISP is or may be in violation of any law, ordinance, regulation, (or if it is decreed or adjudged by any court, tribunal or other authority), the LISP shall immediately take all appropriate steps to remedy the violation and comply with such law, regulation, ordinance or code in all respects. Further, the LISP shall establish and maintain proper records (particularly, but without limitation, accounting records) required by any law, applicable to it from time to time, including records and returns as applicable under labour legislation.

- t) In the event the LISP is aware of a conflict between any of the terms set out under this Agreement, it shall inform TCS of the same. The Parties shall discuss and agree upon the manner in which the LISP should perform its obligations hereunder and the manner in which such conflict shall be resolved.
- u) LISP shall promptly notify TCS on becoming aware of any claim, accusation, notice of violation, demand, action, abatement conditional or otherwise, which has been made against it or TCS or any director, secretary, manager or similar officer of either in relation to the Services or the Agreement. The LISP agrees to cooperate with and assist TCS in taking whatever action which it determines to be reasonably necessary or desirable to mitigate the delay or loss arising from such notice.
- v) LISP's Personnel shall not disrupt or interfere with the performance of duties of TCS employees.
- w) LISP shall adhere to the time-schedule as agreed between TCS and the LISP and notified to the LISP on a time to time basis.
- x) LISP hereby confirms that performance of the Services as per prescribed standards set out in Annexure A is the essence of this Agreement. In the event that TCS determines that the Services are below the prescribed standard as set out in Annexure A then TCS will notify to the LISP and the LISP shall, within a mutually agreed period rectify the same.
- y) The LISP shall not exercise any lien on any of the assets, properties, documents, instruments or materials belonging to TCS available/provided to the LISP in connection with the provision of Services, for any amount due or claimed to be due by the LISP to TCS.

4. **Fees:** - TCS shall pay Fees to LISP as per schedule 2 after deduction of applicable tax at source (TDS) and provide LISP certificate in prescribed format for such deduction. Unless otherwise stated and agreed upon, all fee payment by TCS for the Services provided in terms of this Agreement are exclusive of Goods and Service Tax ("GST") or any such other tax in lieu of GST or any rebate thereof, that may be applicable and arise/or relate to this Agreement. Further, if TCS is required to deduct or withhold any tax charges from any sum payable to Service Provider, then TCS's remittance to Service Provider shall be made after deduction of such amounts. In such instance, TCS will provide information to Service Provider for supporting such deduction.

The Service Provider shall ensure that all invoices issued by it are in the format specified by TCS in GST regulation or failing which an invoice shall be rejected. In case an invoice is so rejected, the Service Provider shall promptly issue a replacement invoice in the specified format.

In case any revision, rectification, modification of the rates, necessitating the issuance of a debit/credit note, the Service Provider shall issue such debit/credit note, as the case may be, no later than September 30 of the succeeding year to the year of provision of Services or date of filing of annual return, whichever is earlier.

The Service Provider is required to ensure that the information it submits to the GSTN portal in relation to the Agreement matches the information contained in the invoice issued to TCS. In case of a mismatch between the two, Service Provider shall promptly, within fifteen (15) days from the date when TCS communicates the mismatch to the Service Provider, amend the invoice or the information submitted to the GSTN portal as the case may be to ensure the same are consistent.

If any tax, rejection of input tax credit, refund or other benefit is charged to TCS and collected from TCS /denied to TCS on account of non-payment to the Government of goods and services tax by the Supplier and/or non-submission/inadequate/incorrect submission of information prescribed by the tax department/ failure to upload the details of the sale on the GSTN portal on the part of the Supplier, then said demand including tax, interest and penalties or said rejected input tax credit, refund or other benefit shall be recoverable from the Supplier. Provided the said tax liability/ rejected input tax credit, refund or other benefit will be recovered by TCS from the Supplier either from his outstanding invoices if available or by raising a debit note, in case the Supplier fails and/or neglects to make payment of said tax amounts including interest or penalty to the tax authorities and submits the tax paid challans as proof of discharge of the tax liability to TCS, within thirty (30) days upon receipt of notice in writing from TCS.

5. **Representation and Warranties:-** (i) Each Party represents, warrants and covenants to the other that: (i) it is duly organized and existing and in good standing under the laws of the country and shall comply with all applicable Laws; (ii) it has the full right and authority to enter into this Agreement and to perform all the obligations (including providing Facilities) under this Agreement and the performance of this Agreement constitutes a legal, valid and binding obligation; and (iii) its execution, delivery and performance of this Agreement does not and will not conflict with, or constitute a breach or default under, its charter of organization, or any contract or other instrument to which it is a party.

(ii) Further, LISP represents and warrants that prior to entering into this Agreement it has fully acquainted itself as on the Effective Date as to all conditions which could affect the performance of its obligations under this Agreement including, without limitation, the following:

- a) All the Facilities provided as per Schedule 2 are in working conditions throughout the Term and in the event they are not in working conditions, LISP shall get it repaired at its own cost.
- b) It has paid all applicable fees, charges, taxes etc. with respect to Facilities provided to TCS and shall at all times be liable to pay such applicable fees, charges, taxes etc. during the term of this Agreement.
- c) LISP shall be responsible for procuring, obtaining and maintaining of all applicable licenses and permits which may be required under any law for performance of its obligations under this Agreement.
- d) LISP has properly evaluated its responsibility and obligations under this Agreement. LISP agrees to bear all and any consequences resulting from its own improper evaluation.
- e) LISP represents and warrants that it has the required experience and capability including sufficient and competent personnel to perform its obligations under this Agreement.

f) LISP represents and warrants that it is fully satisfied with the nature of its obligations as set out in this Agreement and any part of LISP to discover any matters affecting the due performance of its obligations set out in Schedule 2, shall not relieve from its obligations under this Agreement.

g) LISP represent and warrants that its Personnel shall perform its obligation under the LISP's directions and shall not become any employment from TCS by virtue of providing the services any time during the term of this Agreement or subsequently termination or expiration, irrespective of the location of their work.

h) LISP warrants that its obligations shall be performed in a professional and competent manner and shall meet the specific determined in TCS's sole and exclusive discretion and communicated to the LISP from time to time.

6. Indemnity: 6.1 LISP shall indemnify, defend and hold harmless TCS and its officers, directors, affiliated companies, agents, or harmless against any and all liabilities, actions, losses, judgments, payments made in settlement, suits, proceedings, damages, claims, costs and expenses including reasonable attorney's fees from third parties including representative subcontractors of the LISP, resulting from:

- a) failure by the LISP to perform any of its obligations under this Agreement, in accordance with the provisions of this Agreement;
- b) breach of any representations or warranties set out in clause 6 hereinabove;
- c) breach of third party contracts by the LISP, while performing its obligations regardless of whether or not the party bringing suit finally prevails;
- d) any claim from a statutory authority or any employee, agent or authorized person of the LISP or employee, agent or authorized person of a subcontractor of the LISP with respect to the terms of service / employment of the employee, agent or authorized person with it or with the subcontractor of the LISP as the case maybe, arising in relation to noncompliance by the LISP with any matter set out in this Agreement;
- e) any act, commission or omission, negligence, fraud, forgery, dishonesty, misconduct or violation of any of the terms and conditions of this Agreement by the LISP or its Personnel;
- f) any robbery, theft, extortion, misappropriation or accident in relation to any assets or properties or documents or instruments and
- g) any and all adverse claims of whatsoever nature made on TCS by any Personnel of the LISP.

6.2 TCS shall give the LISP, prompt written notice of any loss or discovery of any relevant third party claim ("Third Party Claim") upon which TCS intends to base a request for indemnification under clause 6.1 (an "Indemnification Claim Notice"). In no event shall TCS be liable for any loss that results from any delay in providing the indemnification claim notice. Each indemnification claim notice shall contain a description of the claim and the nature and amount of the loss claimed (to the extent that the nature and amount of such loss is known at such time). TCS shall furnish promptly to LISP copies of all legal notices, correspondence, communications and official documents (including court documents) received in respect of any such loss. For the avoidance of doubt, all indemnification claims under this Agreement in respect of TCS, its affiliates or their respective directors, officers, employees and agents (each, an "Indemnitee") shall be made solely by TCS.

6.3 The LISP shall co-operate with TCS in defending any claim/s against TCS by any local, state or central authority with respect to any taxes, duties, fines, and/or penalties etc, due and payable by the LISP, and shall indemnify TCS, fully and without limit, against the same.

7. Sub-Contract: The LISP shall, subject to the prior written consent of TCS which TCS may deny at its absolute discretion, have the authority to subcontract any part of the Agreement. The appointment of a subcontractor shall be on the following terms:

(a) where TCS expressly consents to the sub-contracting or delegation of any part of the LISP's obligations shall be done post consent from TCS under this Agreement such written consent shall be without prejudice to the LISP's continuing obligation to ensure that the sub-contracting and/or delegated work is continued to be performed at all times in accordance with the requirements of this Agreement.

(b) that the sub-contractor shall be obligated in terms no less protective of TCS's Confidential Information and the assets or properties provided by TCS, than those set out in clause 9 Confidential Information and clause 3 Obligation of the LISP hereof.

(c) That, all the clause of this Agreement which are applicable to the LISP shall be applicable and deemed to be accepted by the subcontractor.

(d) The subcontracting arrangement as contemplated under this clause 7 shall be coterminous with this Agreement.

(e) The LISP shall, subject to the prior written consent of TCS which TCS may deny at its absolute discretion, have the authority to subcontract any part of the Services. The appointment of a subcontractor shall be on the following terms:

(f) where TCS expressly consents to the sub-contracting or delegation of any part of the LISP's obligations under this Agreement such consent shall be without prejudice to the LISP's continuing obligation to ensure that the sub-contracting and/or delegated work is continued to be performed at all times in accordance with the requirements of this Agreement;

(g) that as between the LISP and the subcontractor, all results emerging from such sub-contracted and/or delegated work shall be owned by TCS and exclusively licensed to the LISP for the limited purpose of completing the Services;

8. INSURANCE:

8.1 The LISP shall maintain, at its own cost, the insurance coverage set forth in this clause 8;

a) on and from the Commencement Date, the LISP shall obtain and maintain on an ongoing basis:

- i. Property Damage Insurance for its properties which are utilized for provision of the Services;
- ii. Group Personal Accident Insurance for Personnel deputed at TCS Premises.

b) the LISP shall provide to TCS a copy of the certificate of insurance evidencing the insurance coverage set forth in clause 8.1. The LISP shall provide to TCS at least thirty (30) days prior written notice of any cancellation, non-renewal or material change in any of the insurance coverages.

coverage. The LISP shall, upon receipt of written request from TCS, provide renewal certificates to TCS for as long as the LISP is re maintain insurance coverage hereunder

9. **Limitation of Liability:** TCS shall not be liable to the LISP for any special, indirect, incidental, consequential (including revenue and/or profit), exemplary or punitive damages, whether in contract, tort or other theories of law, even if TCS has been advised of the possibility of such damages. The total cumulative liability of TCS under this Agreement shall not exceed in aggregate the amount paid to the LISP under this Agreement. Nothing in this Agreement shall be taken to exclude or limit the LISP's liability under or arising out of this Agreement whether based in contract, tort (including negligence and strict liability) or otherwise to the extent that such liability can be excluded by law.

10. **Confidential Information:** - Each Party receiving the Confidential Information (the "Receiving Party") acknowledges and agrees to maintain the confidentiality of Confidential Information provided by the other Party (the "Disclosing Party") hereunder. The Receiving Party shall not disclose or disseminate the Disclosing Party's Confidential Information to any person other than those employees, contractors, subcontractors and licensees of the Receiving Party, or its affiliates, who have a need to know it in order to assist the Receiving Party in performing its obligations, or to permit the Receiving Party to exercise its rights under this Agreement. The provisions of this Agreement with respect to Confidential Information shall not apply to the extent, that such Confidential Information is: (a) already known to the Receiving Party free of any restriction at the time it is obtained from the Disclosing Party, (b) subsequently learned from an independent third party of any restriction and without breach of this provision; (c) is or becomes publicly available through no wrongful act of the Receiving Party; (d) is independently developed by the Receiving Party without reference to or use of any Confidential Information of the Disclosing Party; or (e) is required to be disclosed pursuant to an applicable law, rule, regulation, government requirement or court order. Upon the Disclosing Party's written request at any time, or following the completion or termination of this Agreement, the Receiving Party shall promptly return to the Disclosing Party, or destroy, all Confidential Information of the Disclosing Party provided under or in connection with this Agreement, including all copies, portions and summaries thereof.

11. **Intellectual Property Rights:** LISP agrees that TCS Application System, deliverables and work products created or developed by TCS or its employees, representatives etc. using TCS Application System and/or Facilities under this Agreement, together with associated copyright and other intellectual property rights, shall be the sole and exclusive property of TCS. TCS is allowed to use the name and address of the LISP which may be necessary to render the Services to its Customers.

12. **Non-Solicitation:** The LISP (including its officer, staff) and TCS (including its officer, staff) agree that they shall not without the written consent of the other Party, entice, solicit or seek to entice or solicit directly or knowingly with a view to offer employment to any other Party's employees during the period of the Agreement and for a period of one (1) year after the expiry or termination of the Agreement. The LISP and TCS also agree that neither party shall refer the employee of the other Party for employment to a third party.

13. **Illegal Gratification:** The LISP hereby represents that it has not and shall not itself or through any of its Personnel given or promise to give any money or gift to any employee/official of TCS to influence their decision regarding this Agreement, nor shall it utilize any unlawful influence through a promise to pay a commission, percentage, brokerage or contingent fee to secure or so extend the term of this Agreement.

The LISP acknowledges and agrees that it has not, and will not, make or promise to make corrupt payments of money or anything of value directly or indirectly, to any government or public international organization officials, political parties, or candidates for public office or employee of a commercial customer or supplier, for the purpose of obtaining or retaining business or securing any improper advantage.

The LISP agrees that breach of this clause shall be sufficient ground for TCS to terminate this Agreement immediately without prejudice to the LISP's liability under applicable laws. Further, breach of this clause shall also be sufficient ground for TCS to withhold any payments, which may be due to the LISP and for TCS to initiate appropriate legal actions against the LISP.

14. **FORCE MAJEURE:**

Neither Party shall be considered in default in the performance of its obligation under the Agreement, if such performance is prevented or delayed on account of war, civil commotion, strike, epidemics, lockdown, Pandemic, accidents, fires, unprecedented floods, earthquake or because of promulgation of any law or regulations by the Government, unforeseen breakdowns or account of any other Acts of God. In the event of occurrence of a force majeure condition, the affected party shall give a notice in writing within fifteen (15) days from the date of occurrence of the force majeure condition indicating the cause of force majeure condition and the period for which the force majeure condition was likely to subsist. In the event the affected party is prevented from fulfilling its obligation under the Agreement owing to force majeure condition continuing for more than thirty (30) days, both Parties shall consult each other regarding the continuation of the Agreement including early termination as set forth in clause 15.

The LISP shall have in place at all times a detailed contingency and business continuity plan that covers situations where the Services cannot be provided by the LISP including due to Force Majeure Events, malfunction or unavailability of LISP personnel and resources for any other causes. The LISP must ensure that the contingency and business continuity plan and each update to and revised version of the contingency and business continuity plan is agreed by TCS. In the event that the LISP is unable to provide any Service for any reason including a Force Majeure Event, malfunction or unavailability of LISP resources or any other cause, the LISP must immediately notify and comply with the current approved contingency and business continuity plan to ensure continuity of the Services. The LISP confirms that its contingency and business continuity plan will be such that notwithstanding non availability of its resources for any reason whatsoever, the LISP is able to continue to provide the services in accordance with the agreed service levels and otherwise perform all its obligations under this Agreement without interruption.



ASRODEHY
PRINCIPAL
ANNA AMACHARYA INSTITUTE
TECHNOLOGY & SCIENCE

15. INSPECTION AND RIGHT TO AUDIT:

The LISP shall keep complete and accurate records of all operation, expenses and compliance under applicable laws relating to Services provided to TCS. All such records shall be kept on file by the LISP for a period of seven (7) years from the date the records were made.

The LISP shall, upon twenty four (24) hours' notice, allow TCS, its officers, auditors and/or its authorized persons, the opportunity of inspecting, examining and auditing, the LISP's operations and business records which are directly relevant to the Services, as set forth in this Agreement. The LISP will co-operate with TCS's internal or external auditor to assure a prompt and accurate audit of the Services. Audits or reviews will be at the expense of TCS. However, if the audit discovers discrepancies or overcharges, then upon completion of the audit or review, the LISP will reimburse TCS for overcharges and for the cost of the audit.

16. **Termination :- (16.1) Termination for convenience by TCS.** TCS is entitled to terminate this Agreement by giving fifteen (15) days written notice to the LISP. It is acknowledged and agreed between the Parties that LISP does not have right to terminate this Agreement for convenience. In the event if LISP terminates this agreement for convenience, the same shall be construed as material breach of Agreement and TCS shall have the right to claim appropriate damages under the Law and this contract.

(16.2) Termination for Material Breach. Either Party may terminate this Agreement immediately by a written notice to the other Party in the event of a material breach which is not cured within thirty days of the receipt of the said notice period. Failure of LISP to abide by the Levels and denial of access by LISP to TCS on the Facilities shall be termed as material breach and the Agreement shall immediately be terminated by TCS.

(16.3) Effect of termination. Either party shall return to other party any of other party's confidential and proprietary information and materials in its possession. LISP agrees that in the event of expiry or termination of this Agreement for any reason, any accepted and unexecuted Work Order shall be executed by the LISP and all the obligations under such Work Order shall be performed by the LISP.

17. MISCELLANEOUS:

Governing laws: This Agreement shall be governed and interpreted in accordance to the laws of India and the Courts at Mumbai shall have exclusive jurisdiction in all matters arising out of this Agreement.

Arbitration: In case of disputes or differences arising between the Parties hereof, shall be subject matter of arbitration under the Arbitration and Conciliation Act 1996 and any subsequent related amendments there to, unless settled amicably between the Parties hereto, shall be referred to and finally settled by arbitration and such arbitration shall be conducted in accordance with the rules of arbitration of the Indian Chamber of Commerce and Industry ("BCCI"), which rules, as modified from time to time, are deemed to be incorporated by reference into this clause (the "arbitration rules"), by an arbitration panel comprising of a sole arbitrator.

The arbitration panel as referred to above shall be appointed by the BCCI. The arbitration panel shall deliver the award in the arbitration proceedings within three (3) months from reference of any dispute to arbitration. The place of arbitration shall be Mumbai, India.

The Parties agree that the award passed by the arbitration panel shall be final and binding upon the Parties, and that the Parties shall not be entitled to commence or maintain any action in any court of law in respect of any matter in dispute arising from or in relation to this Agreement, except for the enforcement of an arbitral award passed by an arbitration panel pursuant to this clause.

If applicable, in the event that (i) an arbitrator has already been appointed under this Agreement in respect of a dispute and (ii) a dispute arises under a subcontract ("Subcontract Dispute") between LISP and a subcontractor and (iii) the subcontract Dispute concerns the same or substantially the same subject matter as a dispute referred to arbitration under this Agreement referred to in 14.1 above, then within seven (7) days after the acceptance by the arbitrator of its appointment, LISP may require, by notice to the arbitrator, the subcontractor and TCS, that the subcontract dispute be dealt with by the appointed arbitrator in a consolidated arbitration. The LISP will procure that all subcontracts will contain a clause binding the subcontractors to comply with such consolidated arbitration. In the event of consolidation, the Parties will comply with such adjusted timetable for the consolidated arbitration as the arbitrator may direct. The Parties shall be bound by any decision of the arbitrator in the consolidated arbitration on and subject to the same terms as clause 19.1.

Notice: Any notice, request, demand, waiver, consent, approval or other communication permitted or required under this Agreement shall be in writing and shall be deemed given only if delivered by hand or sent by facsimile transmission (with transmission confirmed) or by a delivery service that maintains records of delivery, addressed to the Parties at their respective addresses specified in accordance with clause 1. Any notice given under this Agreement shall be deemed to have been given as of the date delivered if sent by hand or post or as of the date transmitted if sent by facsimile (with transmission confirmed). Any notice delivered by facsimile shall be confirmed by a hard copy delivered as soon as practicable thereafter. This clause is not intended to govern the day-to-day business communications necessary between the Parties in performing their obligations under the terms of this Agreement.

Address for Notice:



A Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE
TECHNOLOGY & SCIENCES
Vijaya Vittala

For LISP	For TCS
Annamacharya Institute of Technology and Sciences, Utukuru Post, Chinthakomma Dinne Mandal, RTQ Office Back Side, Kadapa - 516003, Y S R District.	Communication Address: Olympus A, Opposite Rodas Enclave, Hiranandani Estate, Ghodbunder Road, Patlipada, Thane West, Maharashtra 400607 With copy to Deputy General Counsel Tata Consultancy Services Limited, TCS House, Raveline Street, Fort, Mumbai-400001
Tel: 9603999591	Tel: +91 22 67789008
Fax number: NA	Fax number: NA
For the attention of: Dr. A. Sudhakara Reddy	For the attention of: Venguswamy Ramaswamy

Severability: The Parties acknowledge and agree that if any of the provision of this Agreement is deemed invalid, void, or unenforceable that provision stands severed from this Agreement and the remaining provisions of this Agreement shall remain enforceable.

Non-Assignment: Neither Party shall assign or transfer its rights and obligations under this Agreement without the prior consent of the other Party.

Publicity: The LISP shall not use the name and/or trademark/logo of TCS, its group companies, subsidiaries or associate sales or marketing publication or advertisement, or in any other manner without prior written consent of TCS.

Waiver: No delay or failure of any Party in exercising or enforcing any of its rights or remedies whatsoever shall operate as a bar to the exercise or enforcement of those rights or remedies. No partial exercise or enforcement of any right or remedy by any Party shall preclude or impair any other or further exercise or enforcement of that right or remedy by that Party. Save as expressly provided in this Agreement neither Party shall be deemed to have waived any of its rights or remedies whatsoever unless the waiver is made in writing, signed by a duly authorized representative of that Party and may be given subject to any conditions thought fit by the grantor. Unless otherwise expressly stated, any waiver shall be effective only in the instance and for the purpose for which it is given.

Entire Agreement: This Agreement contains the entire understanding of the Parties with regard to provision of the Services. It supersedes all previous correspondence, proposals, representations, agreement or memorandum of understanding. Any amendment, modification, change or revision to this Agreement shall be by way of mutual agreement between the Parties and which shall be made in writing.

Non Exclusive Agreement: This Agreement is on a non-exclusive basis and the LISP shall not have any exclusive right to the Services to TCS. TCS shall be free to engage any other LISP/s or may entrust services similar to the Services or a part thereof to any other person/s.

TCS Supplier Code of Conduct: The business engagement of TCS with supplier is regulated by the TCS Supplier Code of Conduct. All agencies dealing with TCS like the LISP are also bound by the said TCS Supplier Code of Conduct. The LISP agrees to abide by the said Code and shall promptly inform TCS of any breach or threatened breach of the Code by any person. The LISP shall inform to the Local Ethics Counselor or the Principal Ethics Counselor or the CEO of TCS. TCS, in turn, undertakes to maintain confidentiality of such communication received. Violations and concerns can be reported confidentially via email to corporate.ethics@tcs.com. The TCS Supplier Code of Conduct can be viewed at <https://www.tcs.com/content/dam/tcs/pdf/di/tcs/about-us/TCS-Supplier-Code-of-Conduct.pdf>

Precedence: If there is any conflict among any elements of the Agreement, the descending order of precedence will be (as expressly stated otherwise for any particular Agreement): Services Agreement, Annexes, Purchase Order, Delivery Order



A. S. Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE
TECHNOLOGY & SCIENCE
C. K. Dinne (V&M) Ver

IN WITNESSES WHEREOF the parties have signed this Agreement on this date, month and year first in the presence of following Witnesses:

LISP Name: Annamacharya Institute of Technology & Sciences, Kadapa

By: A S Reddy

Name: Dr. A SUDHAKARA Reddy

Title: Principal
PRINCIPAL

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES

C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

TATA Consultancy Services Ltd.

By: V. Venkateswamy

Name: Mr. Venkateswamy Ramaswamy

Title: Global Head - TCS ION



A S Reddy
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)

SCHEDULE 1

SCOPE OF SERVICES

S. No	Scope Details	Details	Remarks if
A	Test Center Details		
1	LISP Name	ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCINECES,	
2	Nature of Incorporation of LISP	Rental Base	
3	Incorporation Number	NA	
4	CIN /Registration Number	NA	
5	Invoicing Entity	The Principal AITS Examination AC	
6	Registered office address	UTUKURU POST, CHINTHAKOMMA DINNE MANDAL, RTO OFFICE BACK SIDE, KADAPA -- 516003, Y S R DISTRICT.	
7	Authorized Signatory Details		
7.1	Name	Dr. A Sudhakara Reddy	
7.2	Designation	Prinicipal	
7.3	Email Id	aitskadapa@gmail.com	
7.4	Contact #	9603999591	
7.5	Aadhaar #	5890 5282 1867	
8	Vendor Registration	78442	
8.1	Service Tax Number	NA	
8.2	GST #	No	
8.3	Tan #	NA	
8.4	PAN #	AAATA4211D	
8.5	PAN Copy Attached	Attached	
8.6	Name of the Bank	Andhra Bank	
8.7	Bank Address	Yerramukka Pali	
8.8	Bank Account Number	156310100051445	
8.9	NEFT/RTGS Code	ANDB0001563	
8.10	Copy of cancelled bank cheque attached	Attached	
9	Contact Term	3 - YEARS	
10	Effective Date	01-08-2020	
11	Spoc Details		
11.1	Spoc Name	M. Bala Siva Prasad	
11.2	Spoc Designation	Assistant Professor	
11.3	Spoc Contact Number	9959394454	
11.4	Spoc Email ID	balasivaprasad@gmail.com	



Asst. Prof.
PRINCIPAL

Venue Details			
B			
1	Exam / Location Name	Annamacharya Institute of Technology and Sciences,	
2	Exam / Location Full Address	Utukuru Post, Chinthakomma Dinne Mandal, RTO Office Back Side, Kadapa – 516003, Y S R District.	
3	Exam Location City with Pin code	Kadapa – 516003	
4	Distance of nearest Bus Stop from Centre	3 KM	
5	Name of nearest Railway Station to the Test Centre	Kadapa	
6	Distance of nearest Railway Station from	2 KM	
7	Distance & address of nearest Fire station	Kadapa fire station, 4 km	
8	Distance & address of nearest police station	C.K. Dinne, Kadapa . 0.5 km	
S. No	Scope Details	Details	Remarks if A
9	Total no. of seats available in the Campus/at the premises	650	
10	Total no. of seats offered for booking	650	
B	Venue Details		
11	The days on which the venue shall be exclusively provided to TCS ION	As Per Requirement	
12	LISP shall provide written confirmation of center within 48 hours of receiving written request placed by TCS ION	Yes	
C	ION Team Details		
1	Name & Employee Number of ZOM	913425 & Gopal Singh Rajput	
2	ROM Emp # & Name	1102621& K.PAVAN KRISHNA	
3	City Head Emp # & Name	767797 & SYED HARIS	Xstpanik
4	Power Auditor Emp # & Name	1357017 & B Ramesh Babu	B. Ramesh
5	Network Auditor Emp # & Name	1625100& V Mohan Rami Reddy	Vmoharand
6	Audit closure date	12-08-2020	



SCHEDULE 2

S. No	Facilities
	Below mentioned Facilities shall be provided at Location as defined in Schedule 1. Facilities shall be inclusive but not to the following listed:
A	General Facilities Yes

Furnished IT lab/s with furniture/partitions	Class No.	No of Seats/P C in each lab	Block	Floor	No of Seats	Handicap Reserved Seats	Count of washrooms on same Floor.	No of CCTV Camera in Lab	Drinking Availability
B Block_1F_Computer Lab 2A	001	68	Computer Labs	First Floor	68		24Washrooms	30	Yes (RO)
B Block_1F_Computer Lab 2B	002	72			72				
C Block_1F_Cad Cam Lab	003	32			32				
C Block_1F_Simulation Lab	004	24			24				
D Block_1F_PHC Lab	005	10			10				
A Block_1F_Computer Lab 1A	006	66			66				
A Block_1F_Computer Lab 1B	007	45			45				
D Block_1F_Computer Lab 3A	008	64			64				
D Block_1F_Computer Lab 3B	009	41			41				
Zone A	10	44			44	20			
Zone B	11	44			44				
Zone C	12	44			44				
Zone D	13	44			44				
Zone E	14	44			44				
Zone F	15	44			44				

2	Air Conditioned Server Room	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
3	Disconnect AC power from DG Supply	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
4	Power backup	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
4.1	RAW Power	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
4.2	UPS, Preferably online	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

4.3	Working DG (Per node minimum specification needed is 0.3 KVA)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
5	Ventilated UPS Room	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
6	UPS Type (Online/Offline)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
7	UPS Power backup in Minutes	Yes 20 Min	No <input type="checkbox"/>
4	First Aid Box	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
5	Fire Extinguishers with validity	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
6	DG Set with valid AMC & service certificates	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
7	DG Capacity	125 KVA & 60 KVA	
8	Provisioning for Mobile DG/Backup DG incase of DG Failure	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
9	Printer (Laser Jet or Ink jet -BW)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
10	Printing Papers	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
11	CCTV with recording media (CD/DVD) USB	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
12	At least two cameras in each class rooms with zero blind spot	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
13	Path ways covered	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
14	Assembly area covered	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
15	Main gate covered	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
16	PC Configuration	Details	Remarks
16.1	PC Processor (Intel Dual Core and above)	Dual Core 2 and above	
16.2	PC Monitor size (16 inches and above)	17 and above	
16.3	PC RAM (2GB and above)	2GB and above	
16.4	HDD Space:- 150 GB Free space for TCS Owned OS installation.	150 GB and above	
16.5	Motherboard: Motherboard should have PXE enabled LAN card.	PXE enable	
16.6	Monitor Should support screen resolution of 1024 X 768.	Yes	
16.7	Keyboard and Mouse should not be multimedia	Yes	
16.8	IP Camera with storage of 10 days	DVR with one Week	
16.9	1 TB Storage (but depending on the center size, camera resolution, candidate count and duration of shifts)	Yes	

16.10	Approved biometric devices	NO	
17	Networking (LISP shall ensure that all nodes are networked and network connectivity is available at all times)	Details	Remarks
17.1	Network Topology Type	Star	
17.2	Switches Type (Managed /Unmanaged)	D-Link Managed	
17.3	Webcams for registration in each lab	Yes	
17.4	Broadband Availability	Yes	
17.5	Network Switch (100 Mbps) Availability Firewall Availability	1GBPS	
17.6	No. of Computers in the LAN network connected to the firewall	No (Isolation Network for TCS ION)	
17.7	Physically separated network	Yes	
17.8	Network Switch- GBPS	1	
17.9	LAN Cable- CAT6	Yes	
17.10	Manageable Distribution Layer switch with loop prevention enabled.	Yes	
17.11	Network Architecture - Modular Network, Physically Separate network for assessment	Yes	
17.12	More than 2 Mbps speed wired/ broadband connection (for assessment related activities)	Yes	
17.13	Minimum 4 Mbps speed wired/ broadband connection (1:1) for CCTV Live Surveillance	Yes	
17.14	Primary Internet Connection (Bandwidth) ; (Required @ 8 Mbps / 100 Machine)	Yes	
17.15	Primary Internet LISP (Name of the vendor)	BSNL - NME	
17.16	Secondary Internet Connection with Static IP (Availability)	Yes	
17.17	Secondary Internet Connection (Type)	BROD BAND	
17.18	Secondary Internet Connection (Bandwidth)	50	
17.19	Secondary Internet Connection (LISP Name)	CPC INTERNET	
17.20	Up-Time SLA for Internet Service	Yes	
B	Assessment Support		
	As per TCS requirement, LISP will arrange for required assessment support by designating personnel in the role of Administrator, Invigilators, Lab technicians, Security Guards, Lab technicians, Electrician, DG Operator etc. as derived and determined by TCS. TCS and/or its Authorized Personnel shall validate and pay for such invigilation /supervision service as per rates specified. The LISP shall share the details of such personnel providing the invigilation/supervision service with TCS and/or its Authorized Personnel as and when required.		

1	Amenities to be provided	Please Tick (Yes)	Please Tick (No)
1.1	Administrative room/covered area for candidate verification & waiting purpose needs to be provided	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
1.2	Housekeeping staff, Security guards & Water supply should be made available on the test day	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
1.3	The Cafeteria inside the campus should be kept opened on the test day	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
1.4	There will be a Medical Attendant Support available inside the campus on call for any emergency	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
1.5	Parking facility for the candidates vehicles, should be available inside the campus	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
2	Manpower to be provided		
2.1	<p>a) Test Center Administrator (TCA).TCAs Responsibility includes the following besides other activities which may be communicated from time to time:</p> <ol style="list-style-type: none"> 1. IT Readiness prior to Trial Run/Mock Day 2. DG Filled with diesel fuel 3. Clean and sanitized labs/washrooms/ 4. Availability of running water along with clean drinking water 5. Availability of Venue / Support for readiness trials/mock 6. Availability of IT / Venue SPOC /Other required manpower for support 7. Support during Exigency Scenarios 8. Ensuring all required equipment are in serviced and in running condition 9. Coordination with local authorities 10. Overall management of the venue before/during & after the examination exam conduct. 		
2.2	IT Manager , need to have minimum 3 years' experience with good understanding of the venue IT Infrastructure & Network environment and capable to trouble shoot Desktop & Network related issues		
2.3	Security Guards should be trustworthy and active enough to supervise/screen movement of people and support crowd management		
2.4	Electricians/Lab Technicians/ / Generator Operators should be employed with the LISP and well versed with the local infra		
2.5	House Keeping / Cleaning Attendants , need to come early & go last during exam days ensuring cleanliness of the premises		
3	Statutory Compliance		
3.1	Adequate provisioning of Fire Safety Equipment & Fire Extinguishers available at vulnerable locations inside the premises / campus		

3.2	First Aid Box available in the vicinity of the test rooms / computer labs for emergency use		
4	Commercial Terms & Conditions		
4.1	TCS shall pay Fees only for LISP Hardware for nodes at Rs. 50 per node per day for the highest number of nodes used by TCS on the particular day. In case LISP center is not available as per the requirement of TCS, TCS reserves the right to proportionately reduce the node rate basis the number of hours for which LISP has made the nodes available.		
4.2	There shall be NO charges payable for Venue Infra Audit / Venue Compliance & Feasibility Mock tests done at the venue before actual exams scheduled for Certifying the venue readiness.		
4.3	During Usage Period for personnel engaged and if the cost of the same is not included as per above defined rates then LISP shall be entitled to charge TCS for actual number of personnel engaged at the following agreed rates:		

Personnel Description	Single Shift Price	Two Shift Price	Three Shifts Price	Four+ Shifts Price
Test center Administrator	Rs.750 per shift	Rs.1,125 per day	Rs.1,500 per day	Rs.1,650 per day
IT Managers	Rs.750 per shift	Rs.1,125 per day	Rs.1,500 per day	Rs.1,650 per day
IT Assistants	Rs.400 per shift	Rs.600 per day	Rs.800 per day	Rs. 900 per day
Invigilators	Rs.500 per shift	Rs.750 per day	Rs.1,000 per day	Rs. 1,100 per day
Support	Rs.300 per shift	Rs.450 per day	Rs.600 per day	Rs. 650 per day

	TCS ION shall pay the aforesaid charges basis actual invoice received from the LISP.		
4.4	Other Reimbursements : Basis of actual utilization LISP is entitled to charge TCS for reimbursements of expenses on actual spend as defined below:		
	Description	Price	
	Surveillance Camera facility to record a session	Rs.10 per node per day	
	Print Per Sheet	Rs.1 per sheet	
4.5	Diesel Generator Cost: LISP will charge TCS for reimbursement of diesel expenses for the DG usage at rates specified below:		
	Description	Rate	

	Diesel Cost	Rs. 4.5 per candidate		
	Note : In case of DG failure LISP is required to arrange for Backup/Mobile DG, incase same does not work or is not available immediately TCS will arrange for the Mobile DG & cost recovered from the LISP at actuals .On the day of the examination if diesel generator fails and TCS is required to arrange for alternate diesel generator, TCS shall raise a debit note on LISP basis actual expense incurred and adjust the amount from the invoice amount payable to LISP			
	Number of Shift	Single Shift	Double Shift	3 or More Shift
	Minimum Amount	Rs. 800	Rs. 1,500	Rs. 2,200
	LISP shall be eligible for payout basis actual utilization (Diesel Cost per candidate * Number of registered candidates scheduled) or Minimum Amount whichever is higher.			
4.6	Miscellaneous			
1	TCS will raise a Work order whenever TCS wants to use LISP hardware and LISP shall raise an undisputed invoice after the Usage Period within 60 days from the date of examination. LISP shall attach a copy of the Work Order and supporting documents along with the invoice. TCS shall verify the invoice and pay a validated invoice within thirty (30) days from the date of receipt of original hard copy of the invoice on best effort basis.			
2	In case TCS does not receive undisputed invoice within 60 days from the date of examination, TCS shall not be liable to make payment to the LISP			



A. S. Prasad
PRINCIPAL
ANNAMACHARYA INSTITUTE
TECHNOLOGY & SCIENCE

**SCHEDULE - 3
SERVICE LEVEL CREDITS**

- LISP shall provide written confirmation of center within 48 hours of receiving written request placed by TCS. IC shall ensure that the details of personnel providing invigilation/supervision service are shared with TCS per 5 days prior to the period specified in Work Order
- LISP shall ensure that the invoices are dispatched immediately after completion of the project as stated in Work Order



Aslooby
PRINCIPAL
ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
Veri

**SCHEDULE - 3
SERVICE LEVEL CREDITS**

- LISP shall provide written confirmation of center within 48 hours of receiving written request placed
- LISP shall ensure that the details of personnel providing investigation/supervision service are shared personnel 10 days prior to the period specified in Work Order
- LISP shall ensure that the invoices are dispatched immediately after completion of the project as stated in

APPROVAL FOR PROCESSING

Function	Name	Emp Number	Approved (Yes/No)	Sign	Remarks
Power Auditor	B Ramesh Babu	1357017	yes	B. Ramesh Babu	
Network Auditor	V Mohan Rami Reddy	1625100	yes	V. Mohan Rami Reddy	
Center Head	Obu Pratap	1264122	yes	O. Pratap	
City Head	Syed Harris	767797	yes	S. Harris	
ROM	K Pavan Krishna	1102621	yes		Mail Appr
ZOM	Gopal Singh rajput	913425	yes		Mail Appr

END



Ashok Reddy
PRINCIPAL

ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES,
C.K. Dinne (V&M),
KADAPA - 516 003. (A.P.)