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**2.3.1 Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences**

S.No	Content	P.No
1.	<b>STUDENT CENTRIC METHOD ASSESSMENT</b>	2
2.	Sample reports of methods Assessment	
3.	<b>Experimental learning</b>	
	Practical Learning	3
	Internships	12
	Industrial Visits	24
	Workshops	31
4.	<b>Participative Learning</b>	
	Seminar Presentation	33
	Quiz Participation	37
	Symposium in and other colleges	38
	Students Innovation	45
	SIH Participation	47
5.	<b>Problem Solving Methodology</b>	
	Project Expo	50
	Project	51
	Case Study	65
	Sample Tutorial Material	69

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### **STUDENT CENTRIC METHOD ASSESSMENT**

Student-centric strategies are supported by time-proven educational methods for excellent learning results. As a result, our institution emphasizes approaches that are extremely experiential, participatory and problem solving methodology as shown below.

#### **Experiential Learning**

It's a type of learning in which students will learn in their doing and reflect on what they have learned. It includes opportunities for students to engage them academically. As per University regulations practical classes are conducted regularly. Beyond the curriculum, some of the experiential learning is in practice as given below.

- Internships
- Industrial Visit
- Workshops

#### **Participative Learning**

The "participative learning" engage the students to participate as fully as possible in the learning process. And also will assist the students to achieve their desired goal and outcome by various participations. Some of the participative learning is listed below

- Seminar Presentation
- Quiz Participation
- Symposium in and other colleges
- Students Innovation
- SIH Participation

#### **Problem Solving Methodology**


This methodology aims to develop the knowledge of the student in defining the problem statement. It also determines the cause of the problem, identify, prioritize and selecting alternatives for the cause of the problem. The methodology used in our institution is

- Project
- Case Study
- Tutorials

  
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**EXPERIENTIAL LEARNING**  
**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**LABORATORY DETAILS**

S.No	Lab Name	Block Name
1	Peter Norton Lab	MAIN BLOCK
2	Charles Babbage Lab	
3	ShivaayyaDurai Lab	
4	Maxnewman Lab	
5	Craig Larman Lab	
6	Richard Lab	
7	CADD Lab	ANNEXURE BLOCK
8	Digital Lab	

*K. Sathish Kumar*  
**HOD/CSE**  
 Head of the Department  
 Department of Computer Science & Engineering  
 M.A.M. School of Engineering  
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### PETER NORTON LAB

*K. Sathish Kumar*

Head **HOD/CSE** Department

Department of Computer Science & Engineering

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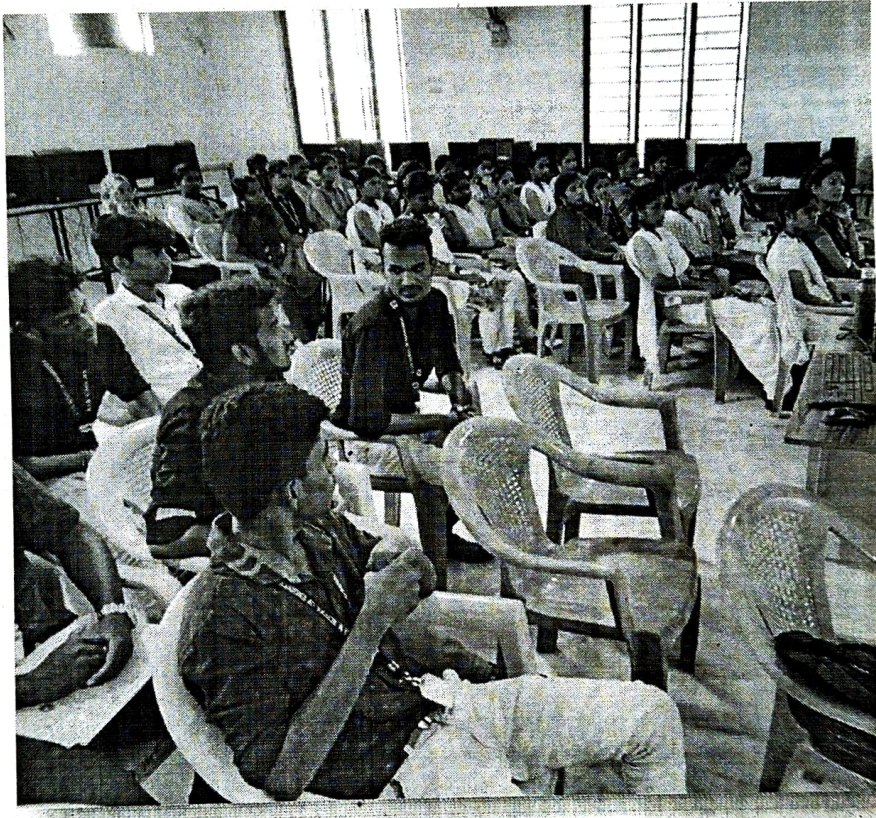
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### CHARLES BABBAGE LAB

*K. Sathish Kumar*  
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Head of the Department  
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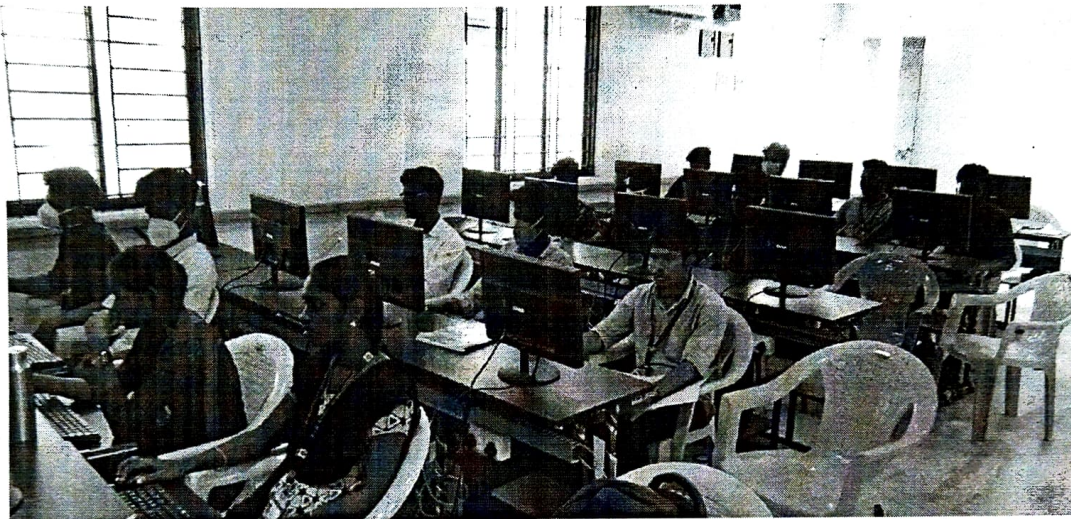
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**CRAIG LARMAN LAB**

*K. Sathish Kumar*  
**HOD/CSE**

Head of the Department  
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**MULTIMEDIA LAB**

*K. Sathish Kumar*

**HOD/CSE**  
Head of the Department

Department of Computer Science & Engineering

M.A.M. School of Engineering

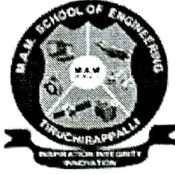
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### SHIVAAYYA DURAI LAB

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### RICHARD LAB

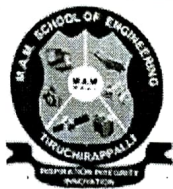
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**HOD/CSE**

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*K. Sathish Kumar*

**HOD/CSE**

Head of the Department

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**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**ACADEMIC YEAR -2020-2021**  
**Internship Details**

S.No	Register Number	Name of the student	Name of the company	Duration
1	812117104001	Aasha G	eCATz Solutions Pvt Ltd.	16.11.20-14.12.20
2	812117104004	A.Akash		
3	812117104008	K.Dhivya		
4	812117104009	Kowsalya R		
5	812117104010	HavishaMonal.A		
6	812117104011	S.Iyyanar		
7	812117104012	Kowsalya M		
8	812117104014	Mahalakshmi E		
9	812117104015	M.Manjula		
10	812117104016	Mohamed Shafvan M		
11	812117104017	Mohamed Yasar S		
12	812117104019	Ramya.R		
13	812117104020	Ranjith.J		
14	812117104021	R.Ranjith		
15	812117104023	Sarma S		
16	812117104024	Sarmila M		
17	812117104026	Sowmiya M		
18	812117104028	M.Thangam		
19	812117104029	Udhayanithi.J		
20	812117104030	Udhayanithi.T		
21	812117104031	Varsha.V		
22	812117104033	Vinothini.R		
23	812117104701	Gomathi.M		

*K. Sathish Kumar*

**HOD/CSE**

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Development Centers : Bengaluru,

Hyderabad, Gunupur, Trichy

Tel : +91 427 4043369, Mobile + 91

9751673512, [info@ecatzsolutions.com](mailto:info@ecatzsolutions.com)

#### Internship Letter

This is to certify that Aasha A. G / IV Year, Department of Computer Science Engineering, M.A.M School of Engineering, Trichy. She had undergone Internship in our company from 16-11-2020 to 04-12-2020. Her approach in learning was good.

For eCATz Solutions Pvt.Ltd

Nandhini.K  
H.r Manager

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Tel : +91 427 4043369, Mobile + 91

9751673512, [info@ecatzsolutions.com](mailto:info@ecatzsolutions.com)

#### Internship Letter

This is to certify that Akash.A / IV Year, Department of Computer Science Engineering, M.A.M School of Engineering, Trichy had undergone Internship in our company from 08.11.2020 to 04.12.2020. Her work was satisfactory and bears a average moral character.


For eCATz Solutions Pvt.Ltd

Nandhini.K  
H.r Manager

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**HOD/CSE**  
Head of the Department  
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**ACADEMIC YEAR-2019-2020  
INTERNSHIPS**

S.No	Register Number	Name of the student	Name of the company	Duration
1	812117104017	S.MohamedYasar	KaashivInfo Tech	02-12-19 – 06-12-19
2	812117104028	M.Thangam	Kaashiv Info Tech	02-12-19 – 06-12-19
3	812117104010	A.HavishaMonal	Pantech	04-06-19 – 08-06-19
4	812117104019	R.Ramya	Pantech	04-06-19 – 08-06-19
5	812117104026	M.Sowmiya	Pantech	04-06-19 – 08-06-19
6	812116104026	A.Tamilselvi	St. Perter's Institute of Higher Education & Research	01-04-20 – 10-04-20
7	812116104023	K.Senthamizhselvi	SD Pro Solutions	23-12-19 – 28-12-19

*K. Saithish Kumar*  
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This is to Certify that

Mr./Ms. M. THANHAM

a Student of M.A.M. SCHOOL OF ENGINEERING

has done the ETHICAL HACKING

Internship in our Company held from 02-12-2019 to  
06-12-2019 and Completed the Training Successfully.



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MANAGING DIRECTOR



**Arunachalam.J**  
PROJECT MANAGER

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This is to Certify that

Mr./Ms. S. MOHAMED VASAR

a Student of M.A.M. SCHOOL OF ENGINEERING

has done the ETHICAL HACKING

Internship in our Company held from 02-12-2019 to  
06-12-2019 and Completed the Training Successfully.



**Venkatesan Prabu.J**  
MANAGING DIRECTOR



**Arunachalam.J**  
PROJECT MANAGER

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
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


Certificate No. PPT 10131


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This is to certify that Mr./Ms. M. SOMNIVA  
from MAM SCHOOL OF ENGINEERING  
department of CSE has  
successfully completed the Internship program in PYTHON  
Duration: 04.6.19 to 8.6.19

  
Technical Director

  
H & Manager

8.6.19  
Date of issue

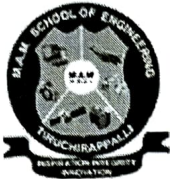
  
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	<b>CERTIFICATE</b> <b>OF INTERNSHIP</b> <b>This certificate is proudly presented to</b>
Mr./Ms <u>TAMILSELVIA</u> of <u>M.A.M School of Engineering, Trichy</u> has successfully completed Ten days Online Internship on <b>"IOT TECHNOLOGIES FOR EMBEDDED COMPUTING"</b> from April 1 <sup>st</sup> to 10 <sup>th</sup> , 2020 organized by <b>Department of Electronics and communication Engineering, St.Peter's Institute of Higher Education &amp; Research, Avadi, Chennai -54.</b>	
 Dr.G.P. Ramesh Professor & Head(ECE)	 Dr.J.M. Mathana Dean, Engineering

 C.No: <u>NAAC/12</u>	
<b>CERTIFICATE OF COMPLETION</b> This certificate is presented to <b>Mr./Ms. <u>K. SENTHAMIZSELVI</u> (812116104023)</b> Has Successfully Completed <u>INTERNSHIP</u> Training Program in " <u>ANDROID App DEVELOPEMENT</u> " During <u>22-12-19</u> to <u>28-12-19</u> Congratulations on a job well done! Awarded this <div style="display: flex; justify-content: space-between;"> <div>           Director       </div> <div>           S. S. L. L.          Technical Head       </div> </div>	

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**ACADEMIC YEAR-2016-2017 – Internship Details**

S.No	Register Number	Name of the student	Name of the company	Duration
1	812114104007	V.Priyanka	Centauruss	04-07-19 – 09-07-16

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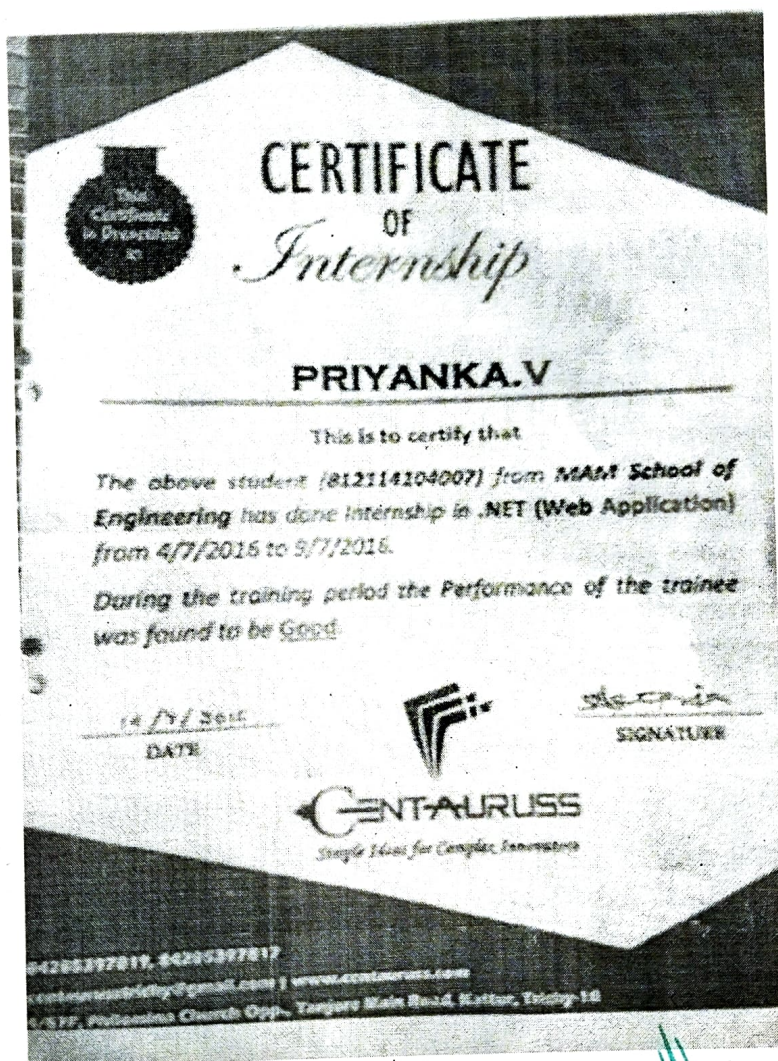
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S.No	Date	Name of the Student	Name of the Industry
1	06.12.2019	S.MohamedYasar	Wikitechy

K.Sathish Kumar

**HOD/CSE**

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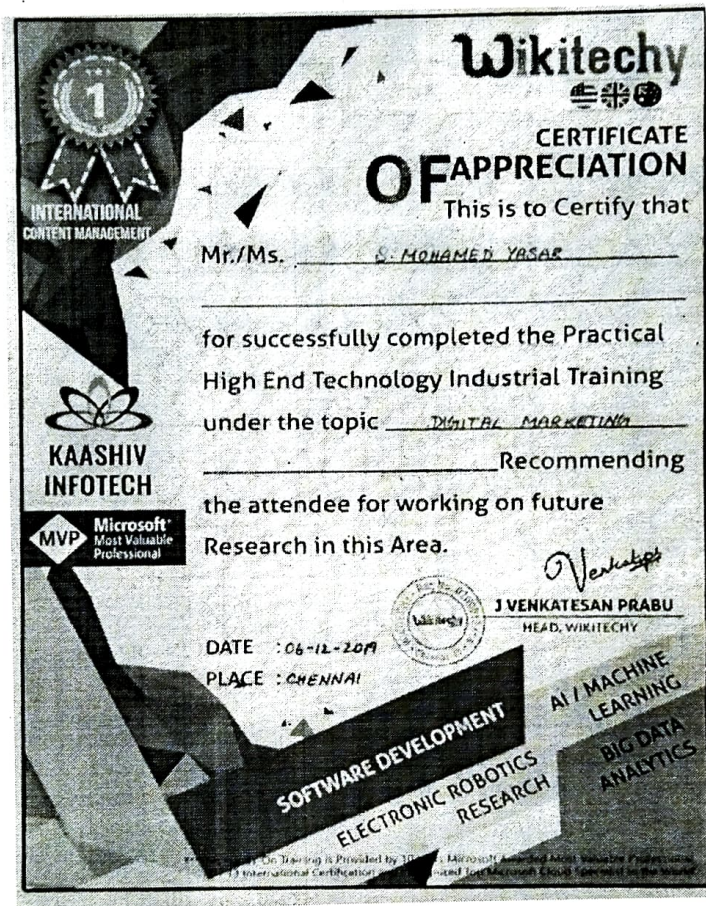
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### DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ACADEMIC YEAR-2019-2020 – Industrial Training Certificate



K. Sathish Kumar


**HOD/CSE**

Head of the Department  
Department of Computer Science & Engineering  
M.A.M. School of Engineering  
Siruganur, Tiruchirappalli - 621 105.

**PRINCIPAL**

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M.A.M. SCHOOL OF ENGINEERING  
SIRIGANUR, TIRUCHIRAPPALLI-621 105.

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**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**ACADEMIC YEAR-2019-2020**  
**IN-PLANT TRAINING**

S.No.	Date	Name of the Company
1	02-12-19 - 06.12.2019	Kaashiv Info Tech

*K. Sathish Kumar*  
**HOD/CSE**  
 Head of the Department  
 Department of Computer Science & Engineering  
 M.A.M. School of Engineering  
 Siruganur, Tiruchirappalli - 621 105.

  
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### DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING ACADEMIC YEAR-2019-2020 IN-PLANT TRAINING



# KaaShiv InfoTech

SOFTWARE DEVELOPMENT & ELECTRONICS / IOT RESEARCH COMPANY  
X-41, shivanantha Building, 5th Floor, 2nd Avenue, Anna Nagar, Chennai - 40  
[www.kaashivinfotech.com](http://www.kaashivinfotech.com)



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## Certificate of Completion

Mr./Ms. S. MOHAMED YASAR

a Student of M. A. M. SCHOOL OF ENGINEERING

has done his/her In-Plant Training in Our Company held from 02-12-2019

to 06-12-2019 and completed the Training Successfully.



**J. VENKATESAN PRABU**  
Managing Director

KAASHIV INFOTECH  
X-41, Shivanantha Building,  
5th Floor, 2nd Avenue,  
Anna Nagar, Chennai - 600 040  
Ph: 7657662428



**J. ARUNACHALAM**  
Project Manager


\*\*\*This Hands-On Training is Provided by 10 Years Microsoft Awarded Most Valuable Professional,  
13 International Certification and Recognized Top Microsoft Cloud Specialist in the World.

*K. Sathish Kumar*  
**HOD/CSE**

Head of the Department  
Department of Computer Science & Engineering  
M.A.M. School of Engineering  
Siruganur, Tiruchirappalli - 621 105.


  
**PRINCIPAL**

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## ACADEMIC YEAR-2018-2019 INDUSTRIAL VISITS

S.No	Date of Visit	Name of the Industry
1	06.02.2019	e-Quadriga Software (P) Limited

  
**HOD/CSE**  
 Head of the Department  
 Department of Computer Science & Engineering  
 M.A.M. School of Engineering  
 Siruganur, Tiruchirappalli - 621 105.

  
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## ACADEMIC YEAR-2018-2019 INDUSTRIAL VISITS

**M.A.M. SCHOOL OF ENGINEERING, SIRUGANUR, TRICHY-621105**  
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(An ISO 9001: 2008 Certified Institution)  
(ACCREDITED BY NAAC)

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**e-Quadriga Software (P) Limited-INDUSTRIAL VISIT - FEB 06 2019**

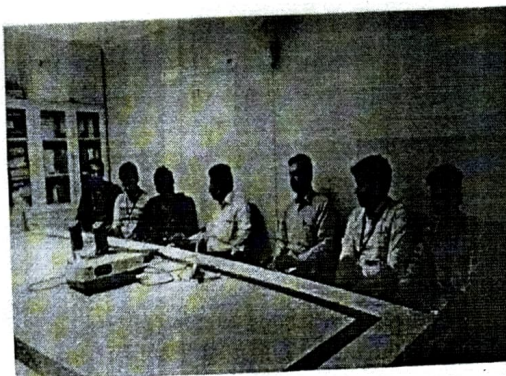
We have started a short trip to e-Quadriga Software (P) limited at 11.10 am. Myself (Mr.M.A.Prasanna) and Mrs.Nandhini devi coordinates third year CSE and three students from second year students. We reached the company around 12.15 PM.I called the HR for accommodation of faculty members and the students from third year and part of second year.

Mr. Raja Deepan.T was the HR of e-Quadriga Software (P) Limited.Mr.Arun Kumar was the project manager of e-Quadriga Software (P) Limited. He gave about brief introduction about the SDLC and their process. He gave an introduction about the product, process, people and project.

He gave an introduction about their company process followed in e-Quadriga Software (P) Limited. He taught about software testing, agile methodologies, waterfall model process. There are four teams in this company.Android, IOS, Developer, Testing and Support teams. Marketing team was responsible for pick the project from the software market.

Student are interactive with the Mr.Arun Kumar, Project Manager,e-Quadriga Software (P) Limited regarding the development of the software project. He told that every phase must be documented.

Students gave a nice feedback about an interaction with the Project Manager. We left the company around 1.40 PM and reached the college around 2.40 PM.



*[Signature]*  
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SIRUGANUR, TIRUCHIRAPPALLI-621 105.

*K. Sakthish Kumar*

**HOD/CSE**

Head of the Department

Department of Computer Science & Engineering

M.A.M. School of Engineering

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### ACADEMIC YEAR - 2018-2019 IN-PLANT TRAINING

S.No.	Date	Company
1	14-12-18 – 18-12-18	KaashivInfotech
2	20-06-18	CAPS Training Institute

K. Sathish Kumar

**HOD/CSE**

Head of the Department

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### ACADEMIC YEAR-2018-2019 IN-PLANT TRAINING




**K. Sathish Kumar**  
**HOD/CSE**

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## ACADEMIC YEAR-2017-2018 INDUSTRIAL VISITS

S.No	Date of Visit	Name of the Industry
1	11-05-18 – 15-05-18	Data Communication in BSNL
2	18-06-18 – 20-06-18	IIHT, Trichy
3	13-02-2018	CMS IT Training Institute

*K. Sathish Kumar*  
**HOD/CSE**

Head of the Department  
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DEPARTMENT OF CSE  
IPT REPORT



STUDENTS NAME : 1. DHIVYA .K 2. SRINITHI .K.B

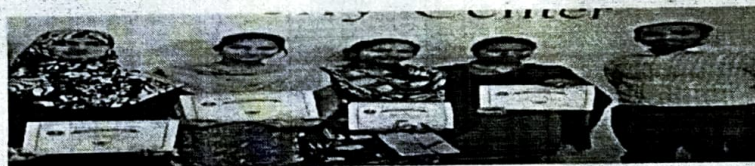
DATES : 11/5/18-15/5/18

CLASS : IV YEAR

TITLE : DATA COMMUNICATION

The above mentioned students of Final year CSE went for in-plant training in Data Communication in DSNL, Trichy from 11/5/18-15/5/18. They have learnt about Analog and Digital signals, how data is transmitted through phone, difference between voice and sound,

Pulse code modulation, Types of signal, difference between current and signal, how information is transferred from one tower to another and about mediums like air, space etc.



STUDENTS NAME : 1. TAMILSELVIA 2. REENA .S 3. PIRTHOSE BANU .N  
4. SENTHAMIZH SELVI .K

DATES : 18/6/18-20/6/18

CLASS : III YEAR CSE

TITLE : C, C++, JAVA

The above mentioned students of Third year CSE went for in-plant training in C, C++, JAVA in IHET, Trichy from 18/6/18-20/6/18. They have learnt about basics of C, C programs, union, structure, all features of JAVA, C, C++ basics like data types, strings etc, basics of BIG DATA and Cloud Computing and how JAVA is platform independent etc.

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K. Sakthi Kumar  
HOD/CSE

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### INDUSTRIAL VISITS



Issue Date: 15<sup>th</sup> February '15

#### TO WHOM-SO-EVER-IT-MAY-CONCERN

This is to certify that **SENTHAMIL SELVI K.** student of "M.A.M. School of Engineering", has successfully completed her "Industrial Visit" at CMS IT Services Pvt. Ltd., Trichy.

The Technologies covered are:

1. Networking.
2. Desktop Engineering

Yours Sincerely,

For CMS IT Services Pvt. Ltd.

Authorized Signatory



Licensed: Entrust Technologies Pvt. Ltd.



3rd Floor, TABS Complex, Opp. American Hospital, 41, Bharathi Dasan Salai, Cantonment, Trichy  
Phone: 0431-4290437, Email: [trichy@cmsinstitute.co.in](mailto:trichy@cmsinstitute.co.in) Web Site: [www.cmsinstitute.co.in](http://www.cmsinstitute.co.in)

*X. Sathish Kumar*  
**HOD/CSE**

Head of the Department  
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Siruganur, Tiruchirappalli - 621 105.

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### PARTICIPATIVE LEARNING

### DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

#### Academic Year – 2019 -2020 - Workshop Participation

S.No	Reg.No.	Student Name	Date	Name of the Topic
1.	812118104002	APPURAJ R	25-07-2019 – 27-07-2019	Innovative Electronics
2.	812118104003	ARIKARAN S		
3.	812118104004	ARUNA M		
4.	812118104006	GURU PRAKASH M		
5.	812118104008	LOGESHWARAN S		
6.	812118104009	MOHAMED ASLAM K		
7.	812118104010	MOHAMMED NAZEEM N		
8.	812118104011	MOHAMED RIYAS M		
9.	812118104012	MUTHUSELVI A		
10.	812118104013	NITHIYA M		
11.	812118104014	PANDI P		
12.	812118104015	PAVITHRA A		
13.	812118104016	POOJA G		
14.	812118104017	PREETHIKA S		
15.	812118104018	PRIYANKA K		
16.	812118104019	RAJADURAI P		
17.	812118104020	RANJANI C		
18.	812118104021	RANJITH KUMAR R		
19.	812118104022	RAVIVARMAN S		
20.	812118104023	REJINA DEVI R		
21.	812118104024	SELVAKUMAR B		
22.	812118104025	SURIYA PRAKASH K		
23.	812118104026	VINITHA V		
24.	812118104027	VIVEDHA R		

K. Sathish Kumar  
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*Academic Year – 2019-2020 - Workshop Certificates*

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	<b>CERTIFICATE OF PARTICIPATION</b>		
	This is to certify that Mr./Ms. <u>SURIYAPRAKASH K</u> studying <u>II-YEAR</u> in the Department of <u>CSE</u> has attended three days Workshop on "INNOVATIVE ELECTRONICS", organized by Department of Electronics and Communication Engineering, in association with <b>LIPT INDIA</b> Pvt Ltd, Trichy- 620002 from 25 <sup>th</sup> July 2019 to 27 <sup>th</sup> July 2019.		
	 DIRECTOR (LIPT INDIA)	 HOD	 PRINCIPAL


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	<b>DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING</b>		
	<b>CERTIFICATE OF PARTICIPATION</b>		
	This is to certify that Mr./Ms. <u>SELVAKUMAR B</u> studying <u>II-YEAR</u> in the Department of <u>CSE</u> has attended three days Workshop on "INNOVATIVE ELECTRONICS", organized by Department of Electronics and Communication Engineering, in association with <b>LIPT INDIA</b> Pvt Ltd, Trichy- 620002 from 25 <sup>th</sup> July 2019 to 27 <sup>th</sup> July 2019.		
	 DIRECTOR (LIPT INDIA)	 HOD	 PRINCIPAL

K. Sathish Kumar  
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**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**Academic Year – 2019 -2020 –Seminar Presentation**


S.No	Reg.No.	Student Name	Date
1	812120104007	Benjeo A	26-12-2020
2	812119104016	R.Kaviyaran	25-08-2020
3	812117104027	B.Sakthi	25-08-2020

*K. Sathish Kumar*  
**HOD/CSE**

Head of the Department  
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***Academic Year – 2019 -2020 - Seminar Certificates***


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IGEN Legendary Seminar 01  
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For his / her active participation in IGEN Legendary Seminar 01  
 Delivered by  
**Padmabhushan Padmashri Dr. A. Sivathanu Pillai,**  
**Father of Brahmos Aerospace**  
 Organized by



  
**Dr. L. RAMESH PILLAI**  
President, IGEN

  
**Dr. D. Gokul**  
Organizing Secretary, IGEN





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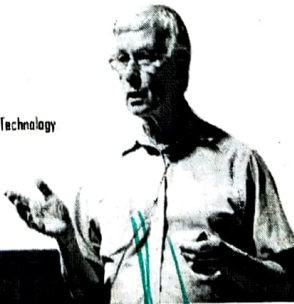
**CERTIFICATE OF PARTICIPATION**

This to Certify that  
**Kaviyarasan. R**  
 of  
**MAM School of Engineering**  
 has attended the IGEN Nobel Laureate Lecture 01 on Sustainable Agriculture  
 by  
 Nobel Laureate Sir Richard John Roberts  
 on 25 Aug 2020.  
 organised by The Institution of Green Engineers (IGEN) jointly with KPR Institute of Engineering and Technology



  
**Dr. M. AKULA**  
General Secretary, IGEN

  
**Dr. M. AKULA**  
Organizing Secretary IGEN NLS




**The Institution of Green Engineers**

**K. Sathish Kumar**  
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**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**Academic Year – 2017 -2018 – Seminar Presentation**

S.No	Reg.No.	Student Name	Date
1	812116104004	A.Arunkumar	27-02-2018
2	812116104028	B.Vijay	27-02-2018

*K. Sathish Kumar*  
**HOD/CSE**

Head of the Department  
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Samsamapuram, Tiruchirappalli - 621 112.

 **IEEE**  
Student Branch Code: 57810004

**Certificate Of  
Participation**

This is to certify that


Mr. A.M. B. VIJAY from


M.A.M. SCHOOL OF ENGINEERING has actively

participated in the "ONE DAY NATIONAL SEMINAR ON IMAGE PROCESSING"

organized by DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING on 27.02.2018.

 Convener  HOD  PRINCIPAL

 **K.RAMAKRISHNAN  
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 **IEEE**  
Student Branch Code: 57810004

**Certificate Of  
Participation**




This is to certify that

Mr. A.M. A. ARUN KUMAR from

M.A.M. SCHOOL OF ENGINEERING has actively

participated in the "ONE DAY NATIONAL SEMINAR ON IMAGE PROCESSING"

organized by DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING on 27.02.2018.

 Convener  HOD  PRINCIPAL

K. Sathish Kumar  
HOD/CSE  
Head of the Department  
Department of Computer Science & Engineering  
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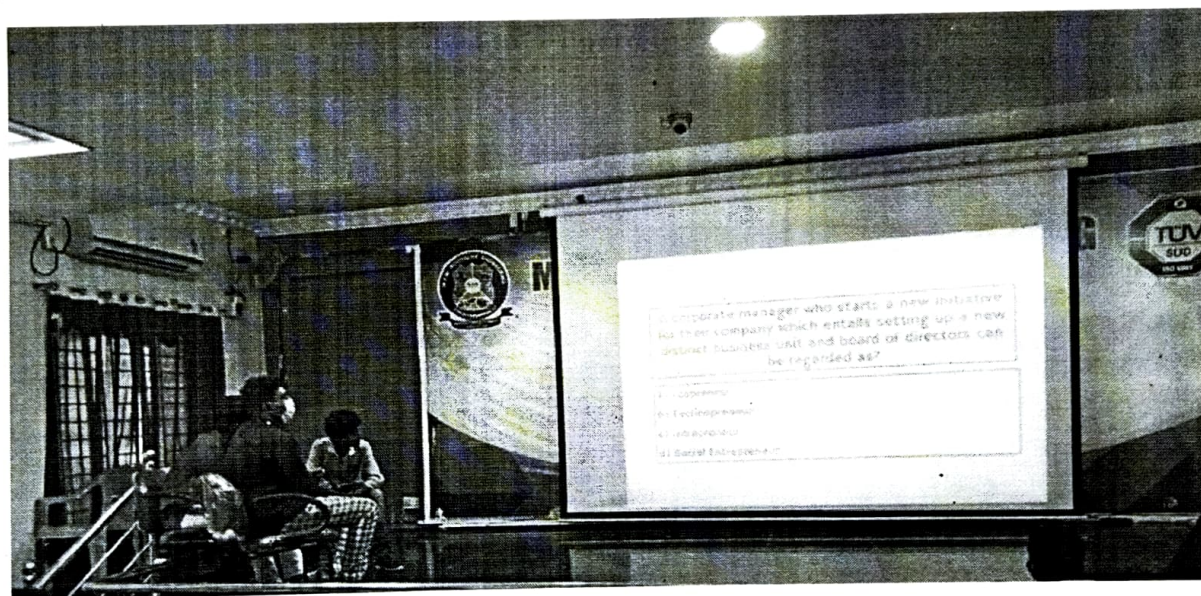
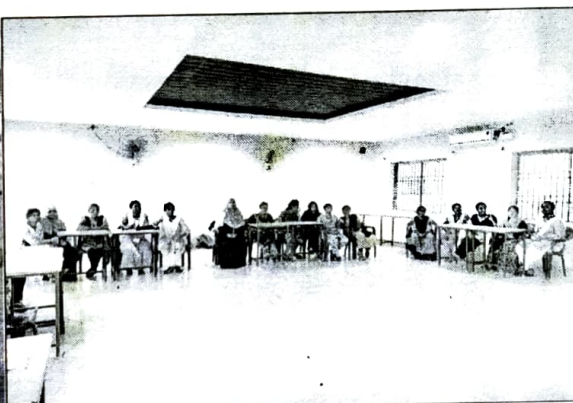
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### Quiz Participation



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**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**Academic Year – 2019 -2020 –State/National Level technical symposium**

S.No	Reg.No.	Student Name	Date	I/II/III/ Participate	Name of the Symposium
1	812119104016	R.Kaviyarasan	28-02-2020	I Prize	INFINITO 20
2	812119104039	A.Viswabharathi			
3	812117104009	R.Kousalya	05-03-2020	Participated	ESPERNZA 20
4	812117104019	R.Ramya			
5	812117104024	M.Sharmila			
6	812117104031	V.Varsha			
7	812117104034	R.Vinothini			
8	812117104701	M.Gomathi			
9	812117104017	S.MohamedYasar			
10	812117104028	M.Thangam			SHEKRAA

*K. Sathish Kumar*

**HOD/CSE**

Head of the Department

Department of Computer Science & Engineering

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*Academic Year – 2019 -2020 - State Level technical symposium Certificates*

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#### Certificate of Excellence

This is to certify that Mr./Ms. KANIVARASAN R has  
won I place in the event MEME HUNT conducted in  
"INFINITO 2K20", a State Level Symposium on 28<sup>th</sup> February 2020 at  
CARE Group of Institutions, Trichy.

Co-Ordinator

Convenor

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### INFINITO 2K20

#### Certificate of Excellence

This is to certify that Mr./Ms. A. VILASBHARATHI has  
won I place in the event MEME HUNT conducted in  
"INFINITO 2K20", a State Level Symposium on 28<sup>th</sup> February 2020 at  
CARE Group of Institutions, Trichy.

Co-Ordinator

Convenor

Director

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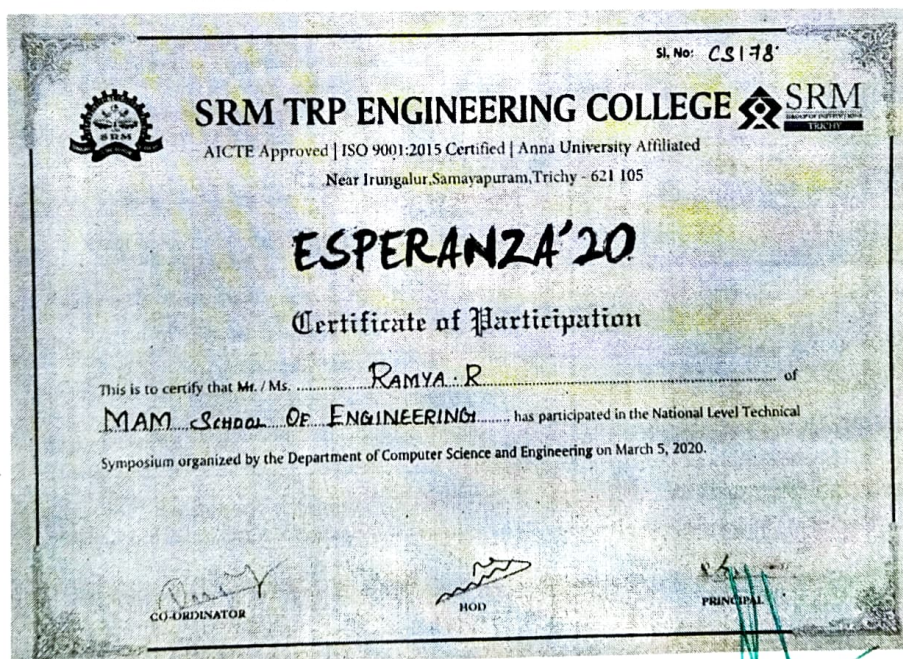
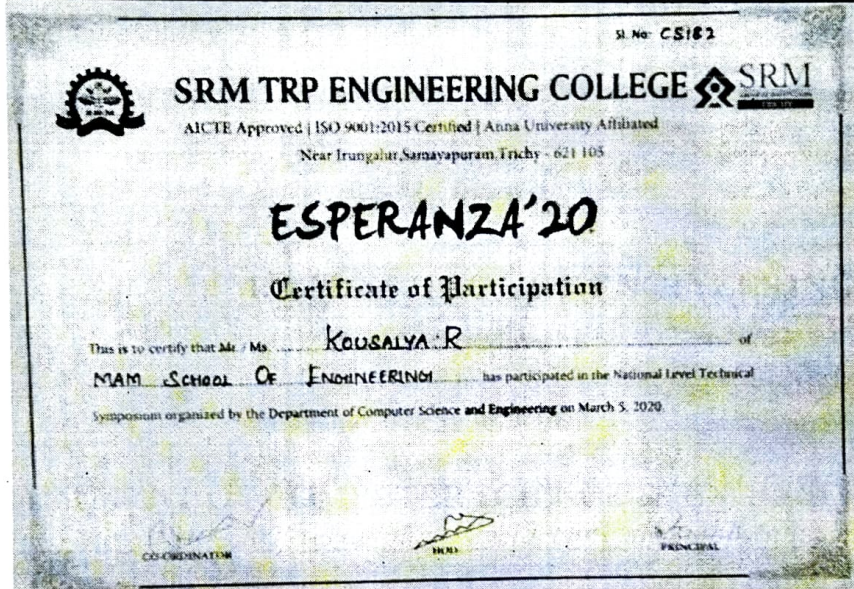
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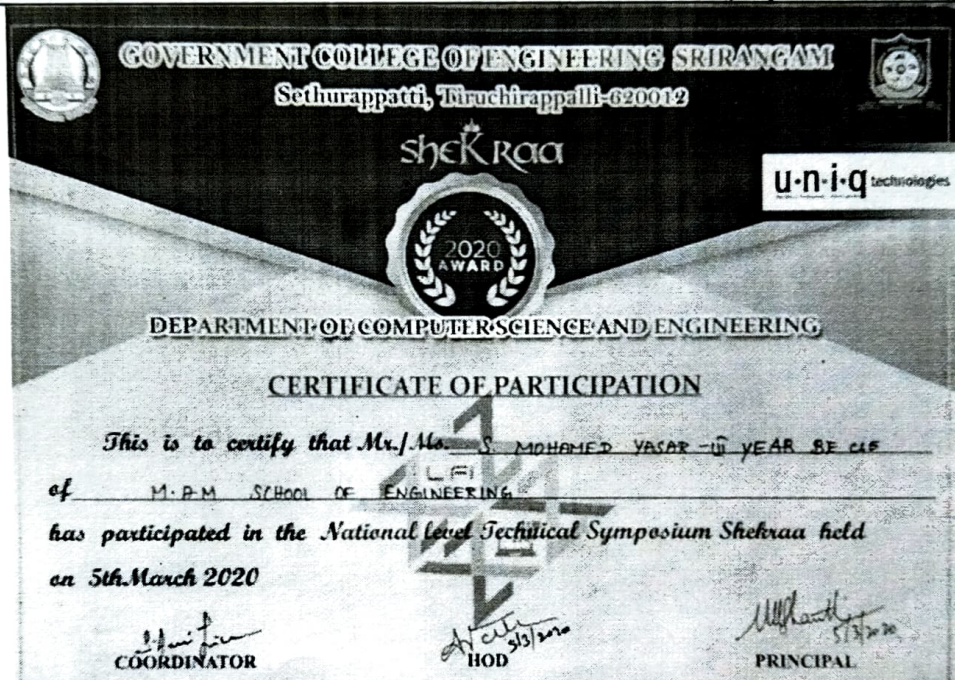
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**PRINCIPAL**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**Academic Year – 2018 -2019 –National Level technical symposium**

S.No	Reg.No.	Student Name	Date	I/II/III/ Participate	Name of the Symposium
1	812115104023	S.Yasvanth	08-03-2019	Participated	MAR TECHNOFEST 2K19
2	812115104018	S.Sharmela			
3	812115104020	M.Sivagandhi			
4	812115104013	S.Noornisha			
5	812115104024	M.Yogapriya			
6	812115104010	F.A.Monica Seles			
7	812115104009	A.MohamedHakkim			

*K. Sathish Kumar*  
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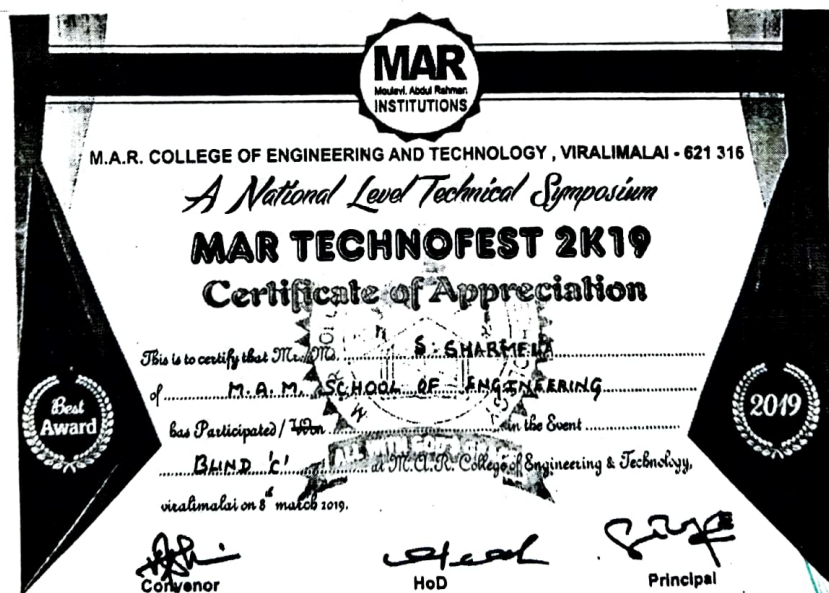
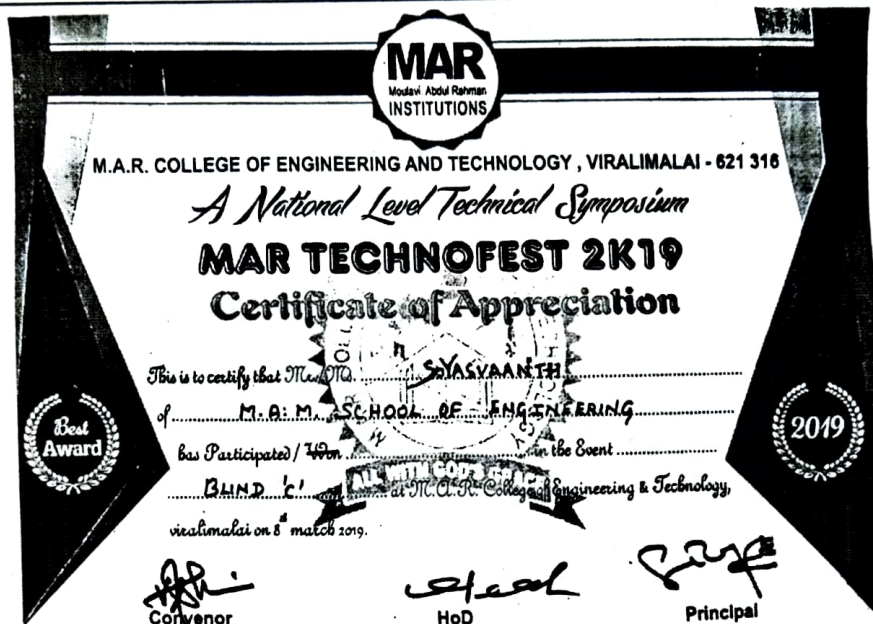
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*K. Sathish Kumar*  
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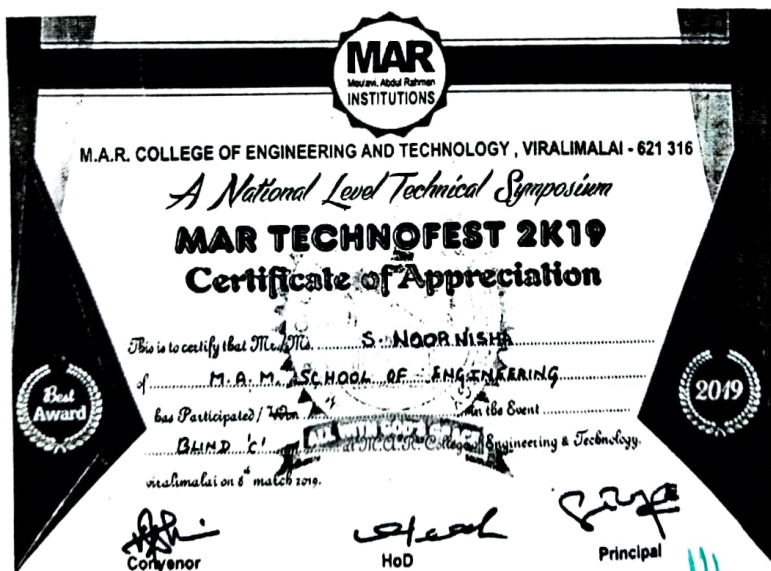
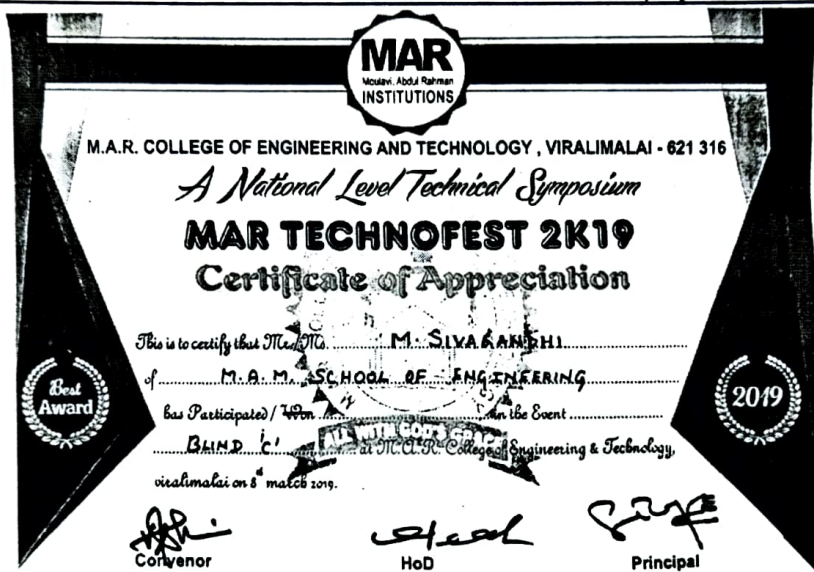
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*K. Sahish Kumar*  
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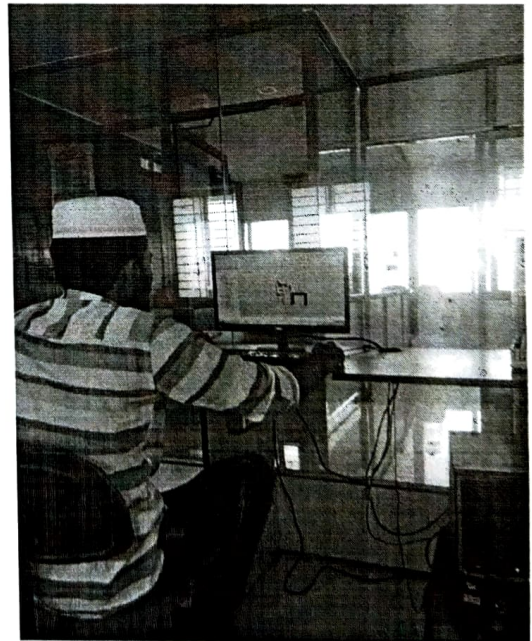
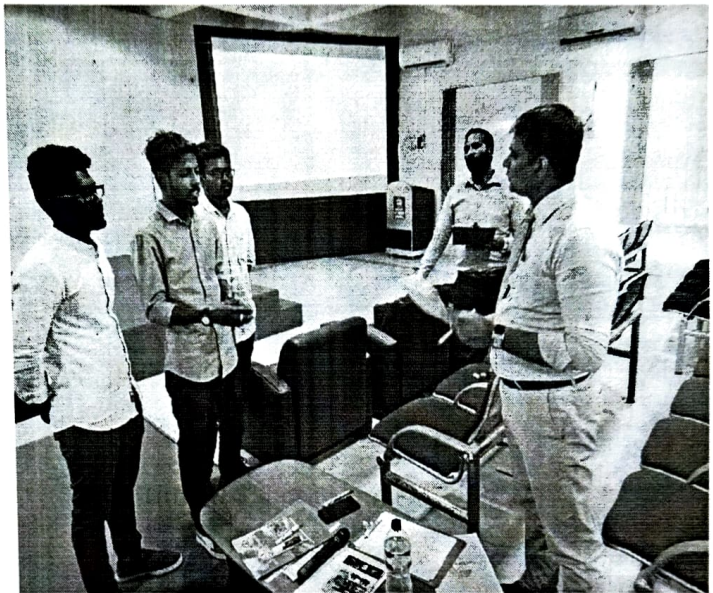
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### Students Innovation







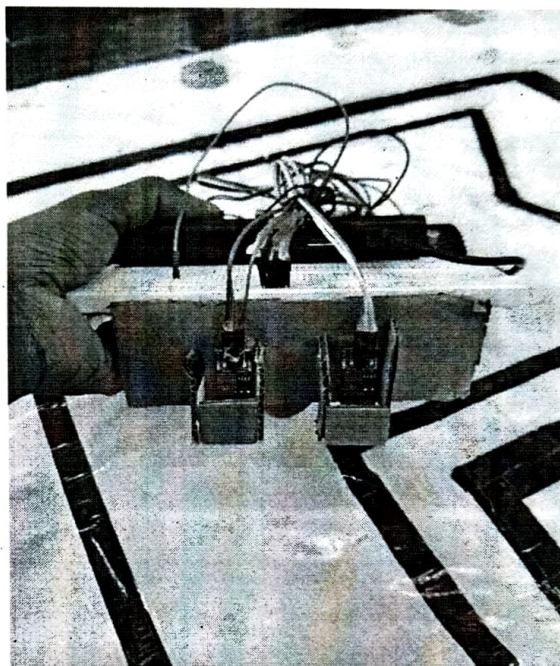
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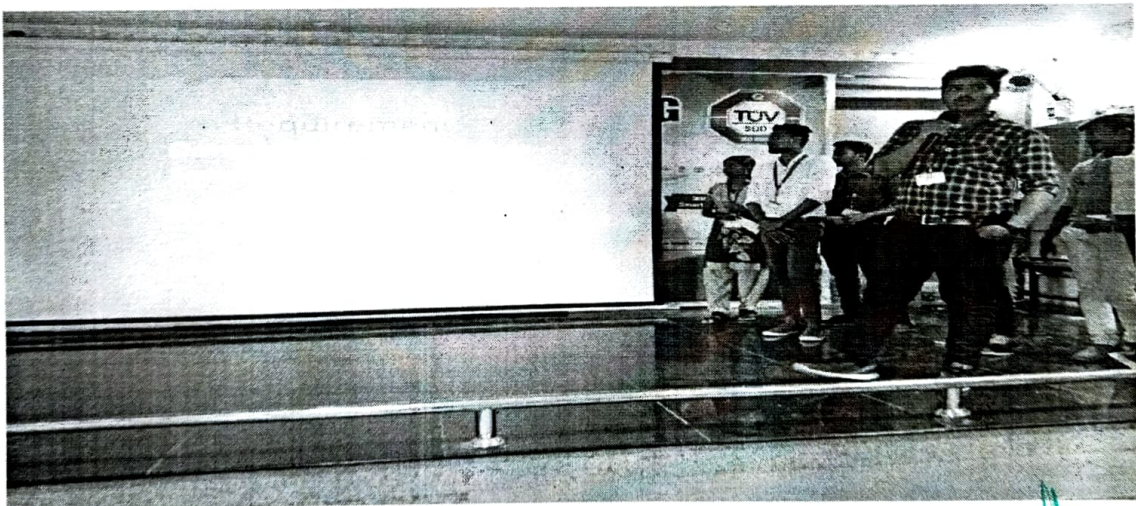
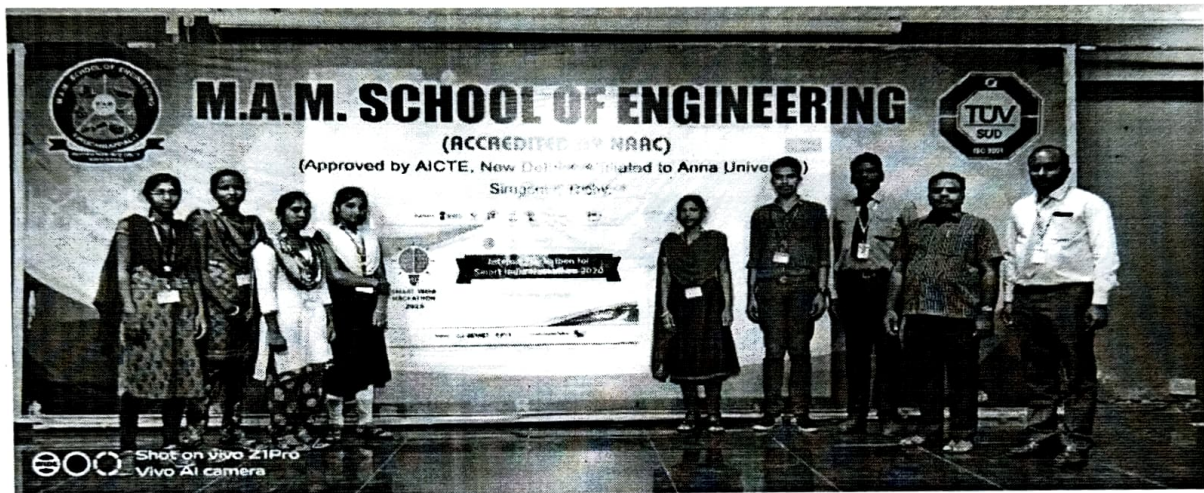
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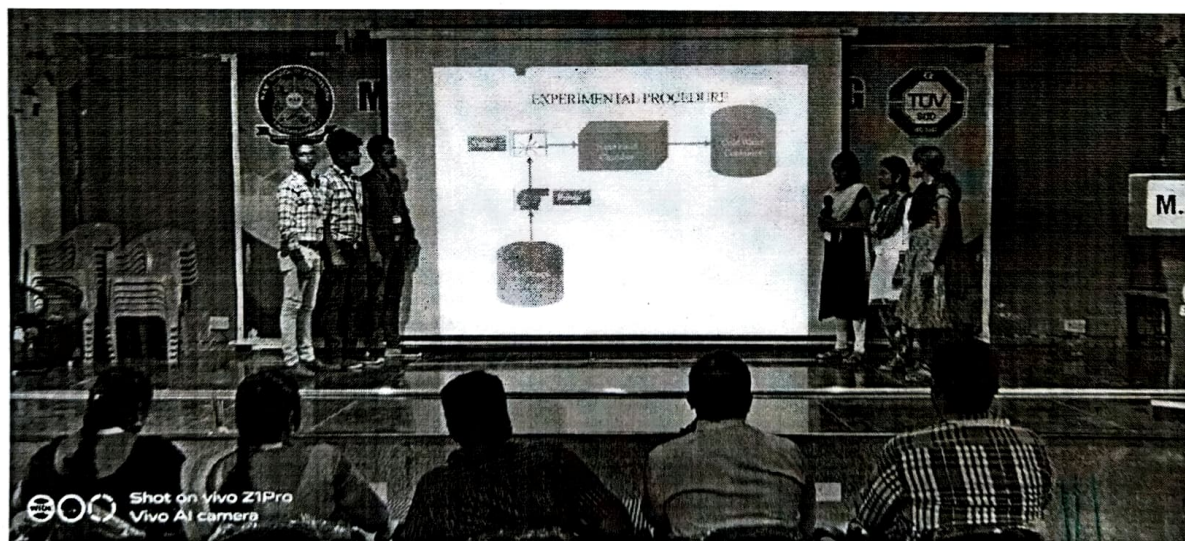
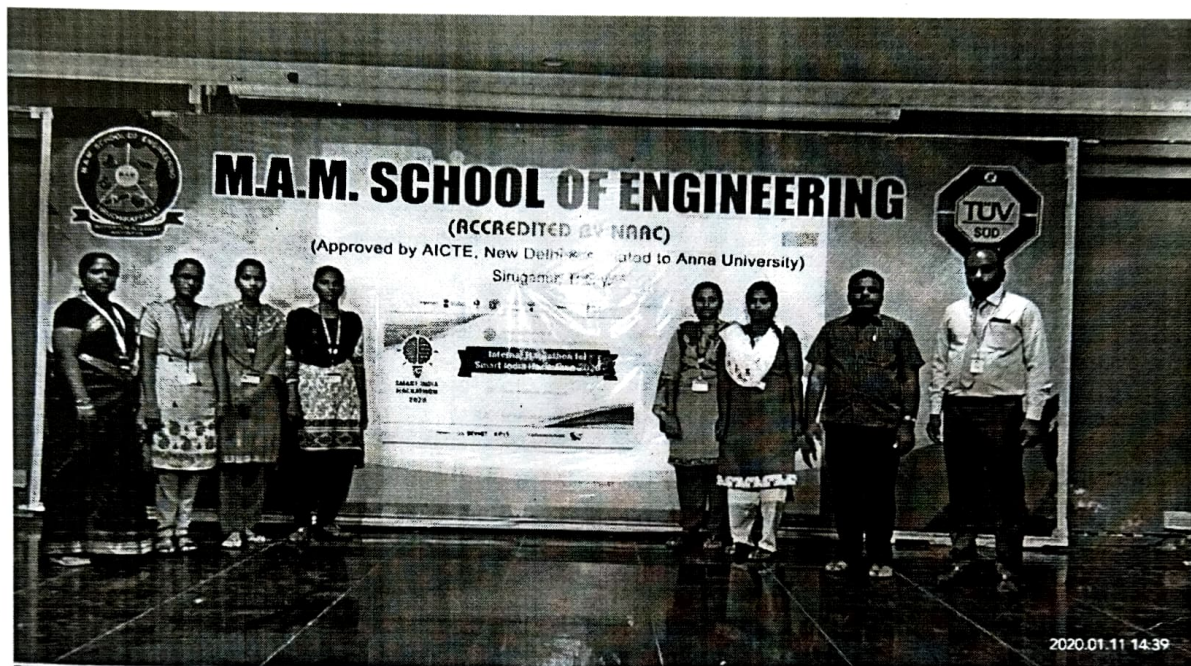
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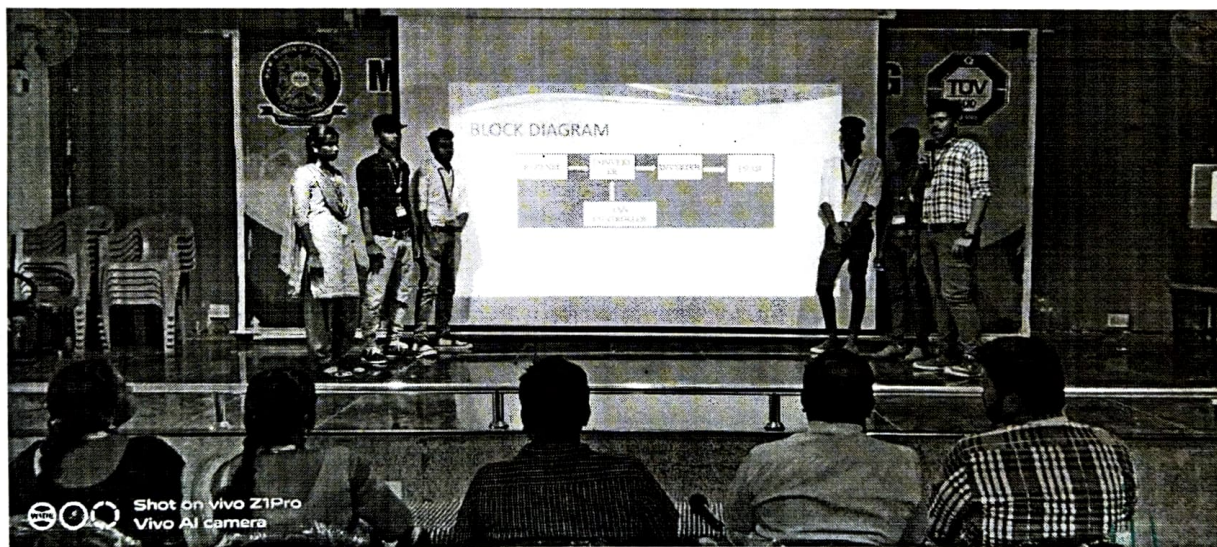
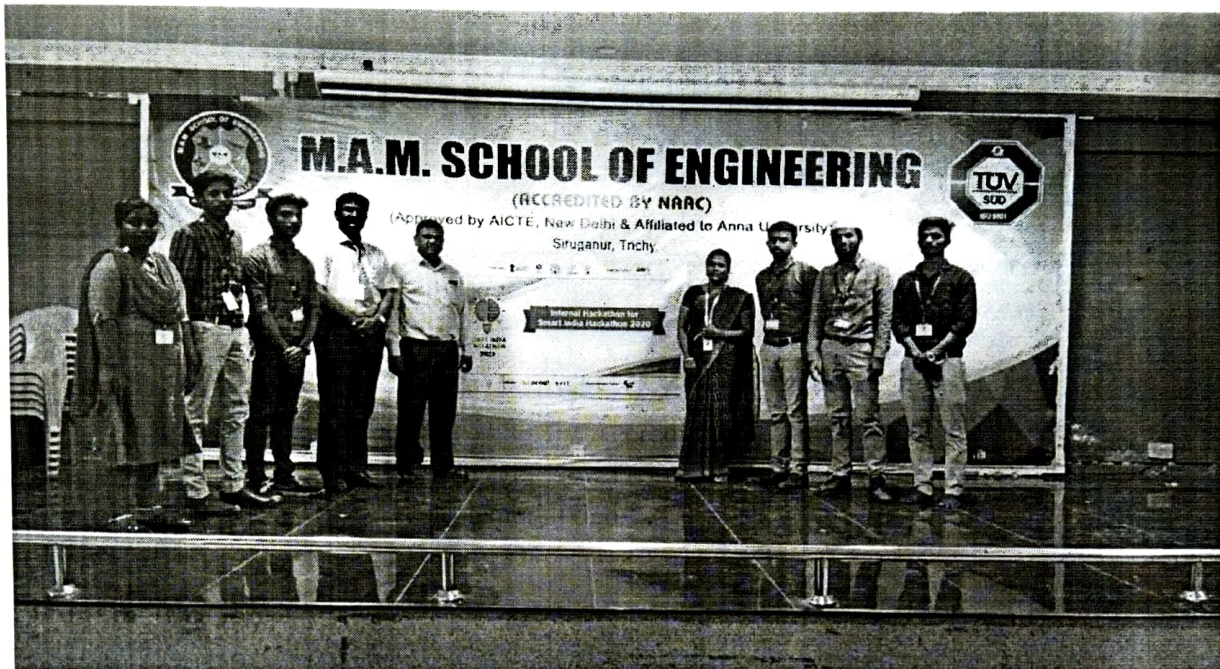
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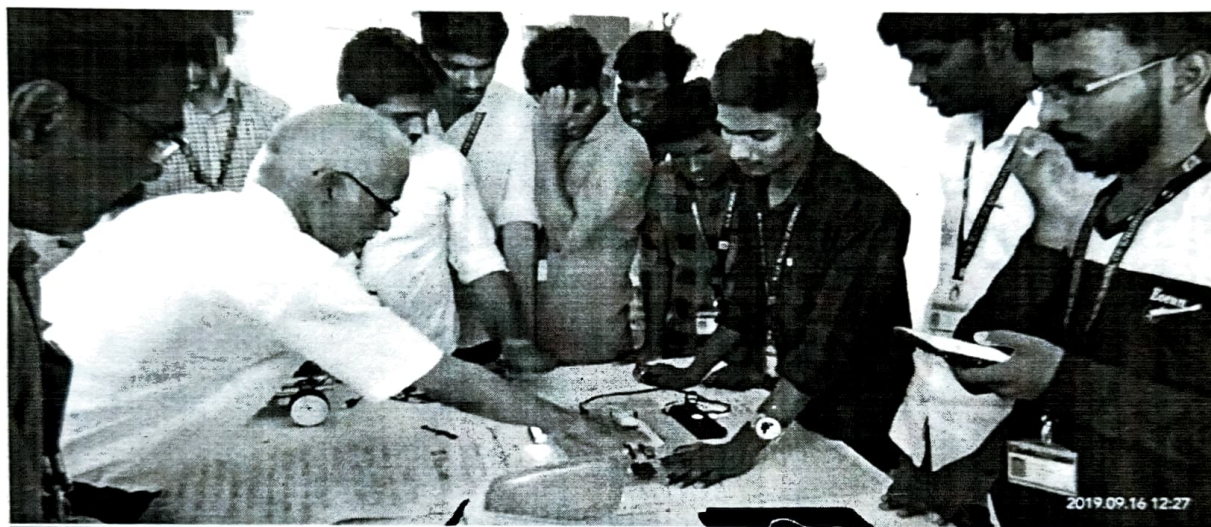
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### PROBLEM SOLVING METHODOLOGY

#### PROJECT EXPO



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## PROJECT BATCH LIST

CSE FINAL YEAR - CS8811-PROJECT VIVA - APR/MAY'2020-2021

S.No.	Reg. No.	Name	BATCH	Guide Names	PROJECT TITLE
1	812117104001	AASHA G	1	P.Sivamalar	Chunk Based Deduplication Checking With Encrypted Data Storage in Cloud
2	812117104004	AKASH A			
3	812117104006	ARTHI S			
4	812117104008	DHIVYA K	2	P.Sivamalar	SQL Injection attack detection in websites
5	812117104009	KOWSALYA R			
6	812117104010	HAVISHA MONAL A			
7	812117104011	IYYANAR S	3	K.Sathish Kumar	Deep Learning Based Object Detection Improvement for Crop leaf Disease
8	812117104012	KOWSALYA M			
9	812117104014	MAHALAKSHMI E			
10	812117104015	MANJULA M	4	S.Murugavalli	Scalable and Secure Big Data IoT System Based on Multifactor Authentication and Lightweight Cryptography
11	812117104016	MOHAMED SHAFVAN M			
12	812117104017	MOHAMED YASAR S			
13	812117104018	PRIYANGA T	5	S.Murugavalli	Parental Monitoring using Andriod Phones
14	812117104019	RAJYA R			
15	812117104020	RANIITH J			
16	812117104021	RANIITH R	6	P.Sivamalar	Darknet/ Yolo Based Animal Surveillance and Accident Prevention Using AI
17	812117104023	SARMA S			
18	812117104024	SHARMILA M			
19	812117104026	SOWMIYA M	7	K.Sathish Kumar	Fast Detection of Transformed Data Leaks in Wireless Sensor Networks
20	812117104028	THANGAM M			
21	812117104029	UDHAYANITHI J			
22	812117104030	UDHAYANITHI T	8	S.Murugavalli	Fast Secure and Anonymous Key Agreement
23	812117104031	VARSHA V			
24	812117104033	VINOTHINI R			
25	812117104701	GOMATHI M	9	K.Sathish Kumar	Against Bad Randomness for Cloud Computing

K. Sathish Kumar  
HOD  
6/8/21

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Academic year (2019-2020)  
Department of Computer Science and Engineering  
CS8611-Project Work

S. NO.	Reg No.	NAME OF THE STUDENT	TITLE OF THE PROJECT WORK	Project Guide
1	812116104004	A.ARUNKUMAR	DRIVER DROWSINESS DETECTION USING FACIAL FEATURES	K.SATHISH KUMAR
	812116104005	C.ANITHADEVI		
2	812116104012	B.KAYATHRI	IMAGE PRIVACY IN SOCIAL NETWORK USING INVISIBLE WATER MAKING TECHNIQUES	K.SATHISH KUMAR
	812116104028	B.VUAY		
3	812116104019	S.REENA	SVM ALGORITHM FOR DETECTION OF SPAMMERS ON TWITTER	P.SIVAMALAR
	812116104020	X.REKA		
4	812116104001	S.ABINAYA	PARKING LOTS SPACE DETECTION USING MRF ALGORITHM	P.SIVAMALAR
	812116104010	K.JEYANTHI		
5	812116104025	C.SUVITHA	IMPLEMENTING ATTRIBUTE BASED ENCRYPTION & DECRYPTION ALGORITHM FOR SECURING FILE TRANSFER OVER CLOUD	G.RAJESHKUMAR
	812116104026	A.TAMILSELVI		
6	812116104011	A.KAVITHA	EFFICIENT INTRUSION DETECTION SYSTEM OF BOTNET COMMAND AND CONTROL TRAFFIC	G.RAJESHKUMAR
	812116104014	A.MAHESH		
7	812116104007	G.DEEPA	MONITORING VEHICLE COMMUNICATION & ROAD CONDITION IN VANET	V.VIDHYA
	812116104008	N.FIRTHOSE BANU		
8	812116104015	AL.MURUGANANTHAM	PRIVACY PROTECTION OF USER BROWSING DETAILS FOR SECURE WEB SEARCH & UNSAFE	V.VIDHYA
	812116104027	K.THILAGGAVATHI		
9	812116104003	M.ALEX PANDIAN	THEFT IDENTIFICATION SYSTEM BASED ON FACE RECOGNITION USING IOT	S.MURUGAVALLI
	812116104023	K.SENTHAMIZH SELVI		

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Head of the Department  
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M.A.M. SCHOOL OF ENGINEERING Siruganur, Tiruchirappalli - 621 105. Academic year (2018-2019) DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING CS6811 - PROJECT WORK				
Year / Sem: IV/VIII				
Batch No	REGISTER NUMBER	STUDENT'S NAME	TITLE OF THE PROJECT	Internal Guide
1	812115104003	K. Dhivya	Smart Personal Security System based on foot ware using microcontroller and GSM.	G Rajesh Kumar
2	812115104018	K.B. Shrinithi	Allocation Cloud Data Center Using Live Migration of Virtual machine Using Cloud Data Center.	S. Murugavathi
3	812115104009	A. Mohamed Hakkim	The next Revolution blog	S. Nagagan
4	812115104022	S. Tamil Selvan	Code Tracker Lightweight Approach to track and protect SMS Messages Using Authorization Codes.	D. Saranya
5	812115104017	K. Maniyanan	Secure Interoperation in the IoT Cloud.	S. Nandhini Devi
6	812115104013	S.M. Shubul Hameed	Big Data Analysis for Framework Collections.	S. Nandhini Devi
7	812115104012	S. Noornisha	Secure Communication by Data analysis in Online Transactions using Big Data.	S. Murugavathi
8	812115104024	M. Yogapriya	Efficient Content Delivery for automated cloud services on Edge data Models	P. Priyanka
9	812115104020	N. Sivagandhi		
10	812115104018	S. Sharmela		
11	812115104010	F.A. Monica Scies		
12	812115104011	T.R.V. Nithish Kumar		
13	812115104012	S. Nizari		
14	812115104005	P. Karra		
15	812115104023	S. Yasevanti		
16	812115104008	S. Mohamed Azarudeen		
17	812115104004	J. Karan		

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Head of the Department  
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DE. PRANITH KUMAR, M.E. Ph.D.  
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### BONAFIDE CERTIFICATE

Certified that this report titled " **SMART PERSONAL SECURITY SYSTEM BASED ON FOOTWEAR USING MICROCONTROLLER** " is the bonafide work of "DHIVYA .K, SHRINITHI K.B" who carried out the project work under my supervision.

SIGNATURE

Mr. T.ASHOK M.E.,  
HEAD OF THE DEPARTMENT  
Computer Science & Engineering,  
M.A.M School of Engineering,  
Siruganur,  
Trichirapalli-621 105

SIGNATURE

Mr.G.RAJESHKUMAR M.E.,  
PROJECT GUIDE  
Assistant Professor,  
Computer Science & Engineering,  
M.A.M School of Engineering,  
Siruganur,  
Trichirapalli-621 105.

Submitted the Project for Viva-voce examination held on 03-04-2019

INTERNAL EXAMINER

EXTERNAL EXAMINER

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K. Sathish Kumar  
Head of the Department  
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Siruganur, Tiruchirappalli - 621 105.

Academic year (2017-2018)

Department of Computer Science and Engineering

#### CS6811-Project Work

S.No	Reg.No.	Name	Project Title	Guide name
1.	812113104001	P.Balasubramanian	Smart Traffic signal controller using Bluetooth based Android Technology	S.Murugavalli
	812113104003	T.Mohamed Azarudeen		
2.	812113104007	V.Priyanka	Search rank fraud and malware detection in google play	S.Nandhini Devi
	812113104008	R.Ragavi		
	812113104009	V.Sangeetha		

  
HOD

Head of the Department  
Department of Computer Science & Engineering  
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Dr.P.RANJITH KUMAR, M.E., Ph.D.,  
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ANNA UNIVERSITY: CHENNAI 600 025

### BONAFIDE CERTIFICATE

This is to Certify that the project report "SMART TRAFFIC SIGNAL CONTROLLER USING BLUETOOTH BASED ANDROID TECHNOLOGY" is the bonafide work of "P.BALASUBRAMANIAN (812114104001), T.MOHAMED AZARUDEEN (812114104003)" who carried out the project work under my supervision.

SIGNATURE 16/4/18

Ms. S. Murugavalli, B.Tech., M.E.,  
HEAD OF THE DEPARTMENT  
Associate Professor,  
Dept. of Computer Science & Engg.  
M.A.M School of Engineering,  
Siruganur, Tiruchirappalli - 621 105.

SIGNATURE 16/4/18

Ms. S. Murugavalli, B.Tech., M.E.,  
SUPERVISOR  
Associate Professor,  
Dept. of Computer Science & Engg.  
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Submission for the University Viva-Voce held on 19-04-2018

SIGNATURE 19/4/18  
INTERNAL EXAMINER

SIGNATURE 19/4/18  
EXTERNAL EXAMINER

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K. Sathish Kumar  
HOD/CSE

Head of the Department  
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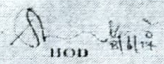
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**M.A.M. SCHOOL OF ENGINEERING**  
Siruganur, Tiruchirappalli - 621 105.  
Academic year (2016-2017)  
**Department of Computer Science and Engineering**  
**CS6811-Project Work**

S.No	Reg.No.	Name	Project Title	Guide name
1	SE2113104012 SE2113104013	Jayaprakashdurai N	EDMRS Encrypted multi-keyword ranked search scheme for preserving cloud data	S. Murugavalli
2	SE2113104017 SE2113104014	Srinivasan R Srinivasan K	Detection of ML behavior node in wireless ADHOC networks using AMD method	S. Nandhini Devi

  
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Dr. PRANJITH KUMAR, M.E., Ph.D.,  
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K. Sathish Kumar  
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### BONAFIDE CERTIFICATE

Certified that this project report "DETECTION OF MISBEHAVIOR NODE IN WIRELESS ADHOC NETWORKS USING AMD METHOD" is the bonafide work of "R. VIJAY SIVA (812113104502), K. SRINIVASAN (812113104503)" who carried out the project work under my supervision.

  
SIGNATURE 12/4/17

S.MURUGAVALLI M.E.,

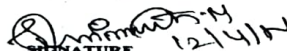
HEAD OF THE DEPARTMENT

Department of Computer  
Science and Engineering

M.A.M School of Engineering

Tiruchirappalli-621105

Submitted for the VIVA VOCE Examination held on 12.04.2017

  
SIGNATURE 12/4/17

M.ARVINDHAN M.Tech.,

PROJECT SUPERVISOR

Department of Computer  
Science and Engineering

M.A.M School of Engineering

Tiruchirappalli-621105

  
INTERNAL EXAMINER

  
EXTERNAL EXAMINER

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HOD/CSE

Head of the Department

Department of Computer Science & Engineering

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
CS6811 -PROJECT WORK



## PROJECT REVIEW SCHEDULE ACADEMIC YEAR 2018-2019(JAN '19' -MAY '19')

S.No.	Project Review	Description	Date	Hour	Remarks
1.	Zeroth Review	Area of Interest	28.12.2018	3,4	
2.	First Review	Title, Abstract	4.1.2019	3,4	
3.	Second Review	Literature Review, Methodology	11.1.2019	5,6	
4.	Third Review	Experiments/Analysis/Model	18.1.2019	3,4	
5.	Fourth Review	Experiments/Analysis/Test Completion status	25.1.2019	5,6	
6.	Fifth Review	Results and Conclusion	1.2.2019	3,4	
7.	Project Report- Rough copy Submission	Submission of Rough Copy	15.2.2019	5,6	
8.	Project Report-Fair Copy Submission	Submission of Fair Copy	1.3.2019	5,6	
9.	Model Review	Complete project presentation & Viva	8.3.2019	1,2,3,4,5,7,8	

*[Signature]*  
Project Co-Ordinator

*[Signature]*  
HOD

*[Signature]*  
Principal

*K. S. Rish Kumar*  
**HOD/CSE**

Head of the Department

Department of Computer Science & Engineering

M.A.M. School of Engineering

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Department of Computer Science and Engineering

**Project Status Report**

Date: 17/03/2014

Subject Code: CS6811-Project Work (IV Year-CSE)

Title of the Project: Implementing attribute based encryption and decryption algorithm on security file transfer protocol

Project Students Name List/Reg.No :

2130104025 - Sathish K  
2130104026 - Ramakrishna

Batch No:

05

Guide Name/Dept : Mr. G. Rajesh Kumar

Books / Journals Yes/No: NO

Requirement planning Yes/No: YES

Designing Yes/No: YES

Implementation Yes/No: YES

Rough Work Yes/No: YES

Final Copy Yes/No: NO

Conference attended Yes/No: YES (Communicated - keep)

Journal Published Yes/No: NO (not published)

Guide Report / Statement : (Confirmation from all above check list)

Communicated to keep (done). Paper will be published soon. - G. Rajesh Kumar

Project Coordinator Sign/Remarks

Verified - [Signature] 14/3/2014

HoD Sign/Remarks

[Signature] 14/3/2014

Principal Sign

K. Sathish Kumar  
**HOD/CSE**

Head of the Department

Department of Computer Science & Engineering

M.A.M. School of Engineering

Siruganur, Tiruchirappalli - 621 105.

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CS6811 - PROJECT WORK (Third Review)

Date: 15.2.2019

Batch. No	REGISTER NUMBER	STUDENTS NAME	TITLE OF THE PROJECT	MARKS				TOTAL (50)	TOTAL (100)
				PPT (10)	TC (15)	IMP (15)	VIVA (10)		
3	812115104011	T.R.V.Nithish Kumar	Big data analysis for framework Collection	8	12	11	6	37	74
	812115104012	S.Nixan		9	13	12	7	41	82
4	812115104007	K.Maniyarasan	The next revolution blog	8	12	11	6	37	74
	812115104017	S.M.Shahul Hameed		9	13	12	7	41	82

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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				PPT (10)	TC (15)	IMP (15)	VIVA (10)		
1	812115104003	K.Dhivya	Smart personal security system based on footware using microcontroller and GSM	9	13	12	7	41	82
	812115104018	K.B.Srinithi		8	12	10	6	36	72
2	812115104022	S.Tamil Selvan	Resource allocation for cloud data centre using live migration of virtual machine	8	12	10	6	36	72
	812115104009	A.Mohamed Hakkim		9	13	12	7	41	82

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CS6811 - PROJECT WORK (Third Review)

Date: 15.2.2019

Batch No	REGISTER NUMBER	STUDENTS NAME	TITLE OF THE PROJECT	MARKS				TOTAL (50)	TOTAL (100)
				PPT (10)	TC (15)	IMP (15)	VIVA (10)		
5	812115104013	S.Noornisha	Lightweight Approach to track and protect authorization codes in SMS Messages	8	12	11	5	36	72
	812115104024	M.Yogapriya		8	10	10	7	35	70
	812115104020	M.Sivagandhi		8	12	11	5	36	72
6	812115104008	S.Mohamed Azarudeen	Efficient Content delivery for automated cloud service and edge data model	8	10	10	7	35	70
	812115104004	J.Karan		8	12	11	5	36	72

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CS6811 - PROJECT WORK (Mock Viva)

Date: 27.05.2019

Batch No	REGISTER NUMBER	STUDENTS NAME	TITLE OF THE PROJECT	Guide Name	MARKS					
					PPT	EC	IMP	TA	TOTAL	GRADE
1	812115104003	K.Dhivya	Smart Personal Security System based on footware using microcontroller and GSM.	G.Rajesh Kumar	1	1	1	1	4	82
	812115104018	K.B.Shrinithi			1	1	1	1	4	82
2	812115104009	A.Mohamed Hakkim	Allocation Cloud Data Center Using Live Migration of Virtual machine.	S.Murugavalli	8	10	10	10	38	80
	812115104022	S.Tamil Selvan			8	10	10	10	38	80
3	812115104007	K.Maniyarasan	The next Revolution blog	S.Navagar	2	12	13	2	29	80
	812115104017	S.M.Shahul Hameed			9	2	13	4	38	80
4	812115104013	S.Noornisha	Code Tracker Lightweight Approach to track and protect SMS Messages Using Authorization Codes.	D.Saranya	1	1	1	1	4	80
	812115104024	M.Yogapriya			1	1	1	1	4	80
	812115104020	M.Sivagandhi			1	1	1	1	4	80

5	812115104018	S.Sharmela	Secure Interoperation in the IOT Cloud.	S.Nandhini Devi	8	12	13	9	42	82
	812115104010	F.A.Monica Seles			8	12	13	9	42	82
6	812115104011	T.R.V. Nithish Kumar	Big Data Analysis for Framework Collections.	S.Nandhini Devi	8	12	13	9	42	82
	812115104012	S.Nixan			8	12	13	9	42	82
7	812115104005	P.Karna	Secure Communication by Data analysis in Online Transactions using Big Data.	S.Murugavalli	8	13	14	7	42	84
	812115104023	S.Yasvaanth			8	14	14	9	45	90
8	812115104008	S.Mohamed Azarudeen	Efficient Content Delivery for automated cloud services on Edge data Models.	E.Priyanka	8	12	13	7	40	80
	812115104004	J.Karan			8	12	13	7	40	80

K.Sathish Kumar  
27/6/19  
PROJECT COORDINATOR

K.Sathish Kumar  
27/6/19  
HOD

Principal



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CS6811 - PROJECT WORK (Mock Viva)

Date: 27.03.2019

Batch No	REGISTER NUMBER	STUDENTS NAME	TITLE OF THE PROJECT	Guide Name	MARKS					
					PPT (10)	TC (15)	IMP (15)	VIVA (10)	TOTAL (50)	TOTAL (100)
1	812115104003	K.Dhivya	Smart Personal Security System based on footware using microcontroller and GSM.	G.Rajesh Kumar	8	12	11	5	36	72
	812115104018	K.B.Shrinithi			8	12	11	5	36	72
2	812115104009	A.Mohamed Hakkim	Allocation Cloud Data Center Using Live Migration of Virtual machine. for Cloud DATA CENTER	S.Murugavalli	9	13	13	8	43	86
	812115104022	S.Tamil Selvan			8	10	10	7	35	70
3	812115104007	K.Maniyaran	The next Revolution blog	S.Nayagan	8	12	10	5	35	70
	812115104017	S.M.Shahul Hameed			9	13	12	7	41	82
4	812115104013	S.Noornisha	Code Tracker Lightweight Approach to track and protect SMS Messages Using Authorization Codes.	D.Saranya	8	12	11	6	37	74
	812115104024	M.Yogapriya			7	11	11	6	35	70
	812115104020	M.Sivagandhi			8	10	11	5	34	68

					(10)	(15)	(15)	(10)	(50)	(100)
5	812115104018	S.Sharmela	Secure Interoperation in the IOT Cloud	S.Nandhini Devi	8	12	10	5	35	70
	812115104010	F.A.Monica Seles			7	13	12	7	41	82
6	812115104011	T.R.V. Nithish Kumar	Big Data Analysis for Framework Collections.	S.Nandhini Devi	8	12	10	5	35	70
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8	812115104008	S.Mohamed Azarudeen	Efficient Content Delivery for automated cloud services on Edge data Models.	E.Priyanka	9	12	12	7	40	80
	812115104004	J.Karan			7	11	11	6	35	70

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### CASE STUDY ON IPR – SAMPLE MATERIAL

# The Major Forms of Intellectual Property

The Utilitarian Basis of IP

Copyright

Creative Works of Expression



Patents

Inventions and Innovation

**Pat. No.**

Trademarks

Lower consumer search costs  
Investments in product quality

**TM**





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### Patents

#### PRO

- Strongly enforceable, fairly broad rights
- (Relatively) clear rights allows easy transactions
- Can protect investments in innovation

#### CON

- Expensive and time-consuming to obtain
- Enforcement can be costly, time-consuming
- Screening process means obtaining rights is not certain
- Term may not be long enough to recoup investments

### Trademarks

#### PRO

- Relatively easy to obtain
- Can protect investments in branding, product quality
- Good at protecting against "knock offs"

#### CON

- (Relatively) narrow rights
- Enforcement can be costly - but less so than patents
- Screening process means obtaining rights is not certain





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### Copyrights

#### PRO

- Very easy to obtain
- Good at protecting creative work, entertainment
- Good at protecting against exact copying

#### CON

- Quite narrow rights - important defenses
- Enforcement can be costly - but less so than patents

### Strategy Chart

	Length of protection	Expense to Obtain	Breadth of Rights	Type of Coverage
Patents	+	\$\$\$	+++	Broad (inventions)
Trademarks	+++	\$	+	Narrow (marks)
Copyrights	+++	\$	+	Very Narrow (works)





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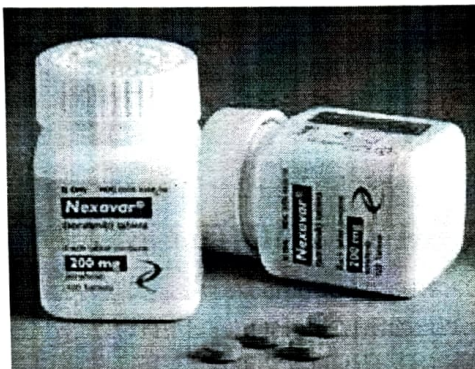
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### Del HC Allows Natco to Export Bayer's Nexavar under the Bolar Exemption



In a significant development today, Justice Endlaw of the Delhi High Court held that 'export' of a patented invention for experimental purposes is also covered under Section 107A of the Patents Act, 1970 (India's Bolar exemption) and thus does not amount to patent infringement. It accordingly allowed Natco to export Bayer's patented drug 'Sorafenib Tosylate' (for which it was granted a compulsory license in 2012) to China for the purpose of conducting development/ clinical studies and trials. It rejected Bayer's contention that such export was in violation of the terms of the compulsory license noting that the license condition for making, sale and use of the drug within the territory of India was limited to the purpose of treating HCC and RCC in humans and did not extend to the purpose of obtaining regulatory approvals which is exempted under Section 107A.

Earlier, in 2014, upon Bayer's application, the court had granted an interim order directing the Customs Authorities to ensure that Natco does not export more than 15 gm of 'Sorafenib Tosylate' for the purpose of obtaining regulatory approvals. Later, Natco was permitted to export 1 kg of the drug for this purpose.





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DEPARTMENT OF MECHATRONICS ENGINEERING  
ACADEMIC YEAR 2020-2021

### SAMPLE TUTORIAL MATERIALS

S. Mulsina Raveen  
ECE - III RD YR

problem 1

Find the DFT of a sequence  $x(n) = (1, 1, 0, 0)$

Let us assume  $N = L = 4$

$$\text{we have } x(k) = \sum_{n=0}^{N-1} x(n) e^{-j 2\pi n k / N} \quad k = 0, 1, \dots, N-1$$

$$x(0) = \sum_{n=0}^3 x(n) = x(0) + x(1) + x(2) + x(3) \\ = 1 + 1 + 0 + 0 = 2$$

$$x(1) = \sum_{n=0}^3 x(n) e^{-j \pi n / 2} = x(0) + x(1) e^{-j \pi / 2} + x(2) e^{-j \pi} + x(3) e^{-j 3\pi / 2} \\ = 1 + \cos \pi / 2 - j \sin \pi / 2 \\ = 1 - j$$

$$x(2) = \sum_{n=0}^3 x(n) e^{-j \pi n} = x(0) + x(1) e^{-j \pi} + x(2) e^{-j 2\pi} + x(3) e^{-j 3\pi} \\ = 1 + \cos \pi - j \sin \pi \\ = 1 - 1 = 0$$

$$x(3) = \sum_{n=0}^3 x(n) e^{-j 3\pi n / 2} = x(0) + x(1) e^{-j 3\pi / 2} + x(2) e^{-j 3\pi} + x(3) e^{-j 9\pi / 2} \\ = 1 + \cos 3\pi / 2 - j \sin 3\pi / 2 \\ = 1 + j$$

$$x(k) = \{ 2, 1 - j, 0, 1 + j \}$$





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Q. Find the 4 point DFT of sequence of  $x(n) = \{0, 2, 4, 6\}$

Given:

$$x(n) = \{0, 2, 4, 6\}$$

$$x(N) = W_N^{nN}$$

$$N=4$$

$$\begin{bmatrix} x(0) \\ x(1) \\ x(2) \\ x(3) \end{bmatrix} = \begin{bmatrix} W_4^0 & W_4^0 & W_4^0 & W_4^0 \\ W_4^0 & W_4^1 & W_4^2 & W_4^3 \\ W_4^0 & W_4^2 & W_4^4 & W_4^6 \\ W_4^0 & W_4^3 & W_4^6 & W_4^9 \end{bmatrix} \begin{bmatrix} x(0) \\ x(1) \\ x(2) \\ x(3) \end{bmatrix}$$

$$\begin{bmatrix} x(0) \\ x(1) \\ x(2) \\ x(3) \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & -j4 & -1 & j4 \\ 1 & -1 & 1 & -1 \\ 1 & -j4 & -1 & -j4 \end{bmatrix} \begin{bmatrix} 0 \\ 2 \\ 4 \\ 6 \end{bmatrix}$$

$$= \begin{bmatrix} 0 + 2 + 4 + 6 \\ 0 - 2j4 - 4 + 6j4 \\ 0 - 2 + 4 - 6 \\ 0 + 2j4 - 4 - 6j4 \end{bmatrix} = \begin{bmatrix} 12 \\ -4 + j4 \\ -4 \\ -4 - j4 \end{bmatrix}$$

$$\text{Ans. } \{12, -4 + j4, -4, -4 - j4\}$$





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7.9.21

DTSP - H.W.

M. Amritha

17 - ECE

1. Find the DFT  $x(n) = \{1, 1, 0, 0\}$

Soln:

$$x(n) = \{1, 1, 0, 0\} \quad N=4 \quad n \Rightarrow 0 \text{ to } n-1 \\ 0 \text{ to } 3$$

$$X(k) = \sum_{n=0}^{N-1} x(n) e^{-j2\pi kn/N}$$

$$X(k) = \sum_{n=0}^3 x(n) e^{-j2\pi kn/N}$$

$$n \rightarrow 0 \text{ to } N-1 = 0 \text{ to } 3. \quad k = 0, 1, 2, 3$$

$$X(0) = \sum_{n=0}^3 x(n) e^{-j2\pi(0)n/4} = \sum_{n=0}^3 x(n) e^0$$

$$= \sum_{n=0}^3 x(n) \times 1$$

$$= \sum_{n=0}^3 x(n)$$

$$x(n) = \{1, 1, 0, 0\} = \sum_{n=0}^3 x(n) = 1+1+0+0 = 2.$$

$$X(1) = \sum_{n=0}^3 x(n) e^{-j2\pi \times 1 \times n/4} = \sum_{n=0}^3 x(n) e^{-j\pi n/2}$$

$$= x(0) e^{-j\pi \cdot 0/2} + x(1) e^{-j\pi/2} + x(2) e^{-j\pi} + x(3) e^{-j3\pi/2}$$

$$= x(0) \times 1 + x(1) e^{-j\pi/2} + x(2) e^{-j\pi} + x(3) e^{-j3\pi/2}$$

$$= 1 \times 1 + 1 \times e^{-j\pi/2}$$

$$= (\cos \theta - j \sin \theta) 1 + e^{-j\pi/2}$$

$$= 1 - j$$





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$$x(2) = \sum_{n=0}^3 x(n) e^{-j2\pi \times 2 \times n}$$

$$= \sum_{n=0}^3 x(n) e^{-j\pi n}$$

$$= x(0)e^0 + x(1)e^{-j\pi} + x(2)e^{-2j\pi} + x(3)e^{-3j\pi}$$

$$= x(0)e^0 + x(1)e^{-j\pi} + 0 + 0$$

$$= 1 \times 1 + 1 \times e^{-j\pi}$$

$$= 1 + (-1) - j \times 0$$

$$= 0$$

$$x(3) = \sum_{n=0}^3 x(n) e^{-j2\pi \times 3 \times n}$$

$$= \sum_{n=0}^3 x(n) e^{-j3\pi n/2}$$

$$= x(0) \times e^{-j3\pi \times 0/2} + x(1) e^{-j3\pi/2} + x(2) e^{-j3\pi \times 2/2} + x(3)$$

$$= x(0) + 1 + x(1) e^{-j3\pi/2} + 0 + 0$$

$$= 1 \times 1 + 1 \times e^{-j3\pi/2}$$

$$= 1 - e^{j\pi/2} (\cos 0 + j \sin 0) = 1 + j$$

$$\therefore x(k) = \{2, 1, -j, 0, 1 + j\}$$





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2) Find the 4-point of sequence of  $x(n) = \{0, 2, 4, 6\}$ .

Soln:

$$x(n) = \{0, 2, 4, 6\}$$

$$x_N = w_N x_n$$

$$\therefore N = 4$$

$$\begin{bmatrix} x(0) \\ x(1) \\ x(2) \\ x(3) \end{bmatrix} = \begin{bmatrix} W_4^0 & W_4^0 & W_4^0 & W_4^0 \\ W_4^0 & W_4^1 & W_4^2 & W_4^3 \\ W_4^0 & W_4^2 & W_4^4 & W_4^3 \\ W_4^0 & W_4^3 & W_4^0 & W_4^1 \end{bmatrix} \begin{bmatrix} x(0) \\ x(1) \\ x(2) \\ x(3) \end{bmatrix}$$

$$\begin{bmatrix} x(0) \\ x(1) \\ x(2) \\ x(3) \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & -j4 & -1 & j4 \\ 1 & -1 & 1 & -j4 \\ 1 & j4 & -1 & -j4 \end{bmatrix} \begin{bmatrix} 0 \\ 2 \\ 4 \\ 6 \end{bmatrix}$$

$$= \begin{bmatrix} 0 + 2 + 4 + 6 \\ 0 - 2j4 - 4 + 6j4 \\ 0 - 2 + 4 - 6 \\ 0 + 2j4 - 4 - 6j4 \end{bmatrix} = \begin{bmatrix} 12 \\ -4 + j4 \\ -4 \\ -4 - j4 \end{bmatrix}$$

$$\therefore \{12, -4 + j4, -4, -4 - j4\}$$





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28/09/21  
Tuesday

Home Work (DTEP)

Chinna  
Date: \_\_\_\_\_  
Page: 78

J. Arrose Bank  
111-yr (F.C.I.E)

Impulse Invariance Method

$$H(s) = \frac{2}{(s+1)(s+2)} \quad \text{determine } H(z) \text{ (Assume } T=1 \text{ sec)}$$

Soln:

$$\text{Given: } H(s) = \frac{2}{(s+1)(s+2)}$$

$$H(s) = \frac{A}{s+1} + \frac{B}{s+2}$$

$$A = \frac{(s+1) \cdot 2}{(s+1)(s+2)} \Big|_{s=-1} = 2$$

$$H(s) = \frac{2}{s+1} - \frac{2}{s+2}$$

$$B = \frac{(s+2) \cdot 2}{(s+1)(s+2)} \Big|_{s=-2} = -2$$

$$= \frac{2}{s-(-1)} - \frac{2}{s-(-2)}$$

Using impulse invariance:

$$H(s) = \sum_{k=1}^N \frac{C_k}{s-p_k} \quad (H(z) = \sum_{k=1}^N \frac{C_k}{1-e^{p_k T} z^{-1}})$$

$$(s-p_k) \text{ is } s-p_k \text{ to } 1-e^{p_k T} z^{-1}$$

$$\text{So } p_1 = -1 \text{ \& } p_2 = -2$$

$$H(z) = \frac{2}{1-e^{-1} z^{-1}} - \frac{2}{1-e^{-2} z^{-1}}$$

For  $T=1 \text{ sec}$

$$H(z) = \frac{2}{1-e^{-1} z^{-1}} - \frac{2}{1-e^{-2} z^{-1}}$$





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$$\begin{aligned} H(z) &= \frac{2}{1 - e^{-1}z^{-1}} - \frac{2}{1 - e^{-2}z^{-1}} \\ &= \frac{2}{1 - 0.3678z^{-1}} - \frac{2}{1 - 0.1353z^{-1}} \\ &= \frac{2(1 - 0.1353z^{-1}) - 2(1 - 0.3678z^{-1})}{1 - 0.503z^{-1} + 0.0497z^{-2}} \\ H(z) &= \frac{0.465z^{-1}}{1 - 0.503z^{-1} + 0.0497z^{-2}} \end{aligned}$$

(2) Using Bilinear Transformation:

$$H(s) = \frac{s+0.2}{(s+0.2)^2 + 9}$$

Soln:

Given:

$$H(s) = \frac{s+0.2}{(s+0.2)^2 + 9}$$

$$\omega_r = \pi/4 \quad \omega_c \rightarrow$$

$$\begin{aligned} \frac{\omega_c^2}{9} &= 9 \\ \omega_c &= 3 \end{aligned}$$

$$\omega_c = \frac{2}{T} \tan \left[ \frac{\omega_r}{2} \right]$$

$$3 = \frac{2}{T} \tan \left[ \frac{\pi/4}{2} \right] \Rightarrow 3 = \frac{2}{T} \tan \left[ \pi/8 \right]$$

$$T = \frac{2}{3} \tan \left[ \pi/8 \right] = 0.276 \text{ sec}$$



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Chima  
Date 03/09/20

$$H(s) = \frac{s+0.2}{(s+0.2)^2 + 9}$$

Using Bilinear Transform

$$H(z) = H(s) \Big|_{s \rightarrow \frac{2}{1+z^{-1}}}$$

$$H(z) = \frac{2}{1+z^{-1}} \left[ \frac{1-z^{-1}}{1+z^{-1}} + 0.2 \right] \Big/ \left[ \left( \frac{2}{1+z^{-1}} \right)^2 + 9 \right]$$

$$\left[ \frac{2(1-z^{-1})}{1+z^{-1}} + 0.2 \right]^2 + 9$$

VEDI 2

Substitute of  $T = 0.276$  sec;

$$H(z) = \frac{2}{(0.276)(1+z^{-1})} \left[ \frac{1-z^{-1}}{1+z^{-1}} + 0.2 \right] \Big/ \left[ \left( \frac{2}{(0.276)(1+z^{-1})} \right)^2 + 9 \right]$$

$$= \frac{(7.25)(1-z^{-1}) + 0.2}{(7.25)(1+z^{-1})} \Big/ \left[ \frac{(7.25)^2(1-z^{-1})^2 + (0.2)^2 + 2(7.25)(1-z^{-1}) \times 0.2 + 9}{(1+z^{-1})^2} \right]$$

$$\because (a+b)^2 = a^2 + b^2 + 2ab$$

$$H(z) = \frac{[(7.25)(1-z^{-1}) + 0.2](1+z^{-1})}{(7.25)^2 \left( \frac{1-z^{-1}}{1+z^{-1}} \right)^2 + (0.2)^2 + 2[(7.25)(1-z^{-1}) \times 0.2] + 9}$$





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$$= \frac{7.95 - 7.95z^{-1} + 0.2 + 0.2z^{-1}}{(1+z^{-1})} \\ = \frac{52.56 \left[ \frac{(1-z^{-1})^2}{(1+z^{-1})^2} \right] + 0.04 + 14.5 \left[ \frac{(1-z^{-1})}{(1+z^{-1})} \right] \times 0.2}{0.2 + 9}$$

$$= \frac{7.45 - 7.05z^{-1}}{52.56 \frac{(1-z^{-1})^2}{(1+z^{-1})^2} + 9.04 + 2.9 \frac{(1-z^{-1})}{(1+z^{-1})}}$$

$$= \frac{(7.45 - 7.05z^{-1})}{52.56 (1-z^{-1})^2 + 9.04 (1+z^{-1})^2 + 2.9 (1-z^{-1})(1+z^{-1})}$$

$$= \frac{(7.45 - 7.05z^{-1})(1+z^{-1})}{52.56 (1-z^{-1})^2 + 9.04 (1+z^{-1})^2 + 2.9 (1-z^{-1})(1+z^{-1})}$$

$$\frac{(a-b)^2}{(a+b)^2} \quad \frac{(a-b)}{(a+b)} \quad \frac{(a-b)(a+b)}{(a+b)(a+b)}$$

$$= 7.45 + 7.45z^{-1} - 7.05z^{-1} - 7.05z^{-2}$$

$$52.56 (1+z^{-2}) = 2(52.56)$$

$$2(1)(z^{-1}) + 9.04(1+z^{-2}+z^{-2})$$

$$+ 2.9(1-z^{-2})$$



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Date: \_\_\_\_\_ Page: 82

$$\frac{7.45 + 0.35z^{-1} - 7.05z^{-2}}{z^{-2}(52.56 + 9.04z^{-1} + (2.9)) + z^{-1}(-2(52.56) + 2(9.04) + (52.56 + 9.04 + 2.9))}$$
$$H(z) = \frac{7.45 + 0.35z^{-1} - 7.05z^{-2}}{z^{-2}(58.7) + z^{-1}(-87.04) + 64.5}$$
$$H(z) = \frac{7.45 + 0.35z^{-1} - 7.05z^{-2}}{64.5 - 87.04z^{-1} + 58.7z^{-2}}$$