KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

DEPARTMENT OF

ELECTRONICS AND COMMUNICATION ENGINEERING

Value Added Course

on

Embedded IoT with Node MCU and Raspberry PICO

Date : 12.02.2024 to 17.02.2024 **Class : II ECE**

No. of Participants: 32

Academic Year: 2023-2024

(EVEN Semester)

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1.	Academic Year	:	2023-2024
2.	Regulation	:	2021
3.	Department Name	:	Electronics and Communication Engineering
4.	Name of the Value Added Course	:	Embedded IoT with Node MCU and Raspberry PICO
5.	No. of Credits	:	2
6.	Category: Theory/Lab/Hands-on/Skill based etc	:	Hands-on
7.	Name and Details of the Joint-organization (industry/NGO etc) if any	:	Pantech e-Learning Solutions, Chennai
8.	Resource person details	:	M.Ramachandran Pantech e-Learning Solutions, Chennai.
9.	Three Member Committee details	:	1. Dr. T. Prathiba, Chairperson 2. Dr.N.M.Mary Sindhuja & Mrs.P.Muthumari , Course Incharge 3. Dr. R. Suresh Babu, HoD/ECE
10.	VAC Coordinator Details	:	Dr.N.M.Mary Sindhuja & Mrs.P.Muthumari
11.	Duration (30 h mandatory)	:	45 Hours
12.	Period	:	12.02.2024 to 17.02.2024 (6 Days)
13.	Venue	:	Research Lab (ECE Lab I, ECE Dept.)

Guidelines / Assessment of VAC:

1. Internal 40 Marks. Preferably Assignments such as mini projects, presentations, worksheets, etc.
2. External 60 Marks. MCQs type.

   MCQs Type question paper pattern : Part A – 30 x 1 = 30 Marks,

   Part B – 15 x 2 = 30 Marks

   Total (IM + EM): 100 Marks

   Passing Criteria: 50 Marks

   No revaluation and no re-exam will be entertained.
3. Mode of External Exam: Online proctored mode
4. Duration of the Exam: 1 h 30 min

VAC Coordinator

HoD/ECE

Dean (Academic Courses)

Encl:

1. Syllabus Copy
2. BoS Approval
3. Three Member Committee MoM
4. Geo-Tagged Photos
5. Certificates of all participants
6. Questionnaire
7. Attendance Sheet
8. Evaluated Answer script
9. Test Report
10. Feedback form
11. Feedback analysis
12. Students' oral feedback and Video (recorded video)

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Department of Electronics and Communication Engineering

Value Added Course on Embedded IoT with Node MCU and Raspberry Pico(12.02.2024 to 17.02.2024)

Mark Statement

SI.No	Roll Number	Register Number	Name of the Student	Mini project	MCQ	Total
1	22UEC004	920422106025	JERLACE SELIN E	28	39	67
2	22UEC006	920422106020	HEMASRI S	34	38	72
3	22UEC007	920422106055	VARSHA DEVI P	32	35	67
4	22UEC011	920422106056	VENKATA HARISH S C	27	32	59
5	22UEC012	920422106018	GANESAN B	25	30	55
6	22UEC013	920422106031	MOHAMED IMRAN FARITH S	25	30	55
7	22UEC014	920422106046	SANTHOSH KUMAR S	26	36	62
8	22UEC015	920422106032	NAVEEN PRASATH S	26	43	69
9	22UEC021	920422106006	ATCHAYA KARTHIKA S	34	38	72
10	22UEC022	920422106030	MARIESWARI M	32	31	63
11	22UEC023	920422106012	DHANUSHDEVA C	36	33	69
12	22UEC024	920422106013	DHARSHINI V	37	34	71
13	22UEC026	920422106043	RITHIKA J	37	35	72
14	22UEC027	920422106028	KISHORKUMAR R	27	51	78
15	22UEC028	920422106042	RESHMA R	34	31	65
16	22UEC029	920422106002	ARCHANA P	32	31	63
17	22UEC031	920422106045	SANKAR M	25	31	56
18	22UEC034	920422106011	DHANUSH G	30	34	64
19	22UEC035	920422106014	DHARUN VAISHNAV S	27	30	57
20	22UEC039	920422106015	DHESIKA K M S	34	39	73
21	22UEC040	920422106022	IMMANUVEL L	30	38	68
22	22UEC041	920422106058	VIVEKA S	28	40	68
23	22UEC045	920422106053	R TEJASWI	32	42	74
24	22UEC047	920422106001	AMEER AJMAL M B	27	30	57
25	22UEC049	920422106057	VIMALRAJ S	30	36	66
26	22UEC051	920422106034	PRADEEPKUMAR S	25	36	61
27	22UEC052	920422106024	JENISHA S	36	38	74
28	22UEC053	920422106005	ASHIF AHAMED J	25	32	57
29	22UEC054	920422106047	SHRUTIKA V	36	38	74
30	22UEC055	920422106004	ARUN KUMAR M	36	35	71
31	22UEC057	920422106017	EBBY ALLAN RAJ A	36	41	77
32	22UEC063	920422106304	MEYYALAGAN.M	27	32	59

VAC Coordinators

HoD/ECE 27/4/24.

None sign with Date

FIVE DAYS VALUE ADDED COURSE ON EMBEDDED IOT WITH NODE MCU AND RASPBERRY PICO

About the Program

Embedded systems and the Internet of Things (IoT) have found a transformative ally in the Raspberry Pico. This credit-card-sized computer has become a linchpin for innovation in these fields, offering affordability and versatility. With its GPIO pins and connectivity options, it's an ideal platform for creating embedded systems and IoT applications. Whether you're a novice or a professional, the Raspberry Pico open-source ecosystem and strong community support make it an invaluable tool. In this exploration, we'll delve into the powerful fusion of embedded systems, IoT, and the Raspberry Pico, unlocking a world of creative possibilities, from smart homes to industrial automation. Welcome to the future of connectivity and innovation.

Technologies and Tools Covered

- Arduino IDE
- Arduino Programming & Hardware
- Raspberry Pico Setup and Configuration
- MicroPython Programming for Raspberry Pico
- Sensor Interface to Raspberry Pico
- Communication Protocols (MQTT)
- Blynk IoT Platform
- Thingspeak for Cloud Data Upload

Pantech e Learning
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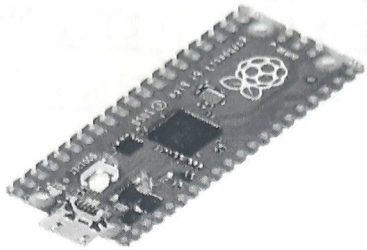
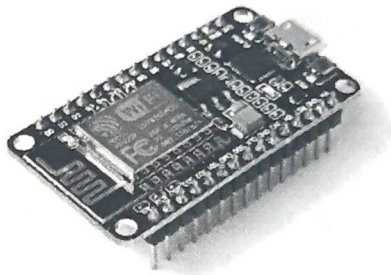
Tools

ThingSpeak™



MQTT

ARDUINO



LEARNING PATH

I. Embedded Systems & Raspberry Pico Architecture &Programming

Introduction to the Concept of Embedded Systems, Node MCU and Raspberry Pico Architecture Basics, Raspberry Pico Setup and Configuration using Python, will be dealt with. Simple programs shall be done by the participants. This shall serve as the first step nto the entry to advancedconcept implementation using Raspberry Pico.

SESSION	CLASS TOPICS
1	Introduction to Embedded Systems and the Overview of Applications
2	Overview of Raspberry Pico Architecture and Setup
3	Overview of Node MCU and Configuration
4	Raspberry Pico Configuration, GPIO Interaction
5	Introduction to Communication Protocols: MQTT
6	Interface LED, Buzzer with Raspberry Pico
7	Interface with I2C LCD

I. Interfacing Sensor and Embedded

Interfacing Sensors like Ultrasonic, IR, MEMS Sensors to the Arduino Controller, Getting Datafrom the Sensor and Interfacing Relay into Arduino.

SESSION	CLASS TOPICS
1	Interface with Sound / DHT11 / IR Sensor
2	Interface with Ultrasonic / LDR Sensor
3	Interface with Gas /Water Level Sensor
4	Interface with PIR / / Soil Moisture Sensor
5	Interface with DC motor

II. Interfacing Actuators

SESSION	CLASS TOPICS
1	Overview of Smoke Sensor
2	Interface with Accelerometer
3	Overview of servo motor
4	Interface with Servo Motor

III. Interfacing With IOT

SESSION	CLASS TOPICS
1	Interfacing with sensor and IOT
2	• HANDS and TRANING Connect Microcontroller with Wi-Fi • Creation of ThingSpeak Account • Creation of telegram account • Creation of watsapp account • Blynk IOT • MQTT
3	Mini Project

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Projects & Assignments.

Training Methodology

The Program is mix of Theory sessions, Quizzes, Hands on Sessions, Liver Interaction with Experts, Assignments and Practical Exercises. Maximum Impetus is given to Hands on Sessions so as to enable the participants with the maximum knowledge transfer and satisfaction. The ratio of the theory, practical sessions will be 30:70.

Program Advantage

- **Code with Explanations**

  Learn everything about Embedded and Arduino, with a well-structured curriculum &detailed explanations with code.

- **Assignments**

  Work on various assignments which will be graded by our Trainer.

- **Projects**

  Solve real world problems as part of projects and receive valuable feedback from our trainer.

Upon Successful Completion of the Program

Upon completion of the program, the participant will have an in-depth insight into the Arduino Programming, Sensor Interfacing and Embedded. The participants will be able to program the controller and develop basic / complex applications on his own, thus making the objective ofthe training program as desired.

Participants also will have access to our TECHNICAL FORUM, thus getting their doubts clarified even after the session is complete. Certificates will be provided upon request.

Course Incharges

HOD | ECE

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Department of Electronics and Communication Engineering

Seventh BoS Meeting Minutes

Date : 30.09.2023

Time : 2.00 PM

Venue : VLSI Lab, ECE Department

Link (hybrid mode) : https://tinyurl.com/mu6nhaud

The following members were present:

S.No.	Name of the Expert	Designation	Capacity
1.	Dr.E.S.Gopi, Ph.D.,	Associate Professor/ECE National Institute of Technology, Tiruchirappalli, Tamil Nadu	Anna University Nominee (Online mode)
2.	Dr. M. Sabarimalai Manikandan Ph.D.,	Associate Professor, Department of Electrical Engineering, Indian Institute of Technology Palakkad	Academic Council Nominee 30/09/2023
3.	Dr. A Kannammal, Ph.D.,	Associate Professor/ ECE PSG College of Technology, Avinashi Rd, Peelamedu -641004, Coimbatore	Academic Council Nominee (Online mode)
4.	Mr.M.Chinnathambi, M.E.,	Technical Lead Viasat India, Global Infocity, Module 1&2, 5th Floor, Block C, No.40, MGR Salai, Perungudi- 600 097, Chennai.	Industrial Expert
5.	Ms.A.Anto Amala, M.E.,	Associate Staff Engineer, Samsung Semiconductor India Research, Laxmi Sagar Layout, Mahadevapura, Bengaluru, Karnataka 560048	Alumni

Internal Faculty Members of BoS			
S.No.	Name of the Faculty	Designation	Signature
1.	Dr.R.Suresh Babu	Professor & Head	
2.	Dr.T.Pandiselvi	Associate Professor	
3.	Dr.N.M.Mary Sindhuja	Associate Professor	30/9/2023
4.	Dr.T.Prathiba	Assistant Professor	30/9/23
5.	Dr.S.Nisha Rani	Assistant Professor	30/09/2023
6.	Mrs.C.Nagavani	Assistant Professor	30/9/'23
7.	Mr.P.Aravind	Assistant Professor	
8.	Mr.R.Ashok	Assistant Professor	
9.	Mrs.M.Stella Mercy	Assistant Professor	
10.	Mr.S.Alwyn Rajiv	Assistant Professor	
11.	Mrs.P.Muthumari	Assistant Professor	
12.	Mrs.P.Ramalakshmi	Assistant Professor	
13.	Mr.R.Rajprabu	Assistant Professor	

007.01.00 : Welcome address by HoD

- Dr.R.Suresh Babu, Professor & Head welcomed the BoS members.

007.02.00 : Approval of 6th BoS Meeting Minutes & Action taken

Item No.	Suggestions of BoS Members in 6th BoS Meeting	Action Taken
1.	Dr.E.S.Gopi, Ph.D., suggested to include prerequisites for each course in the Professional elective list.	Unit I is framed as basic for all the professional courses
2.	Dr.E.S.Gopi, Ph.D., insisted to have some of the courses as industry based and partially it can be handled by the experts from industry.	Semiconductor Test Engineering Course will be handled by the faculty members trained by Tessolve Semiconductor pvt ltd, Bangalore. Tessolve Semiconductor Industrial persons will also handle some topics. Value added courses are completely handled by the industrial persons.
3.	Dr.E.S.Gopi, Ph.D., also suggested to have Data Analytics as a common course for all the departments.	Data Analytics course is included in Institute level minor courses.
4.	Dr. M. Sabarimalai Manikandan Ph.D., insisted to give Open ended projects across the departments.	Many students are doing projects with other department students
5.	Dr.E.S.Gopi, Ph.D., and Dr. M. Sabarimalai Manikandan Ph.D., suggested to include Microprocessor as 1 unit in Embedded and modify the course name as Microprocessor and Embedded Systems	Included Microprocessor as 1 unit in Embedded and modified the course name as Microprocessor and Embedded Systems
6.	Dr.E.S.Gopi, Ph.D., insisted to combine control systems with Signals and Systems. Include the course Statistical Theory of Communication which may include Detection, Estimation and Information Coding. Dr.T.Prathiba suggested to bring the course Artificial Intelligence and Machine Learning in VI Semester. Move the course Statistical Theory of Communication in VII Semester.	Control system is combined with sensors and is included as Profeesional Elective. Included the course Statistical Theory of Communication which may include Detection, Estimation and Information Coding. Artificial Intelligence and Machine Learning is brought to VI Semester
7.	Dr.E.S.Gopi, Ph.D., and Dr. M. Sabarimalai Manikandan Ph.D., suggested to include Microprocessor experiments also and modify the course title for Embedded	Microprocessor experiments are included and modified the course title as Microprocessor and Embedded Systems laboratory

	Systems laboratory as Microprocessor and Embedded Systems laboratory	
8.	Dr.E.S.Gopi, Ph.D., and Dr. M. Sabarimalai Manikandan Ph.D., suggested to rename the course VLSI Testing and Design for Testability as VLSI Architecture for Signal Processing and Machine Learning	VLSI Testing and Design for Testability course is renamed the course as VLSI Architecture for Signal Processing and Machine Learning
9.	Dr.E.S.Gopi, Ph.D., suggested to include the Acoustics also in Speech Processing course. Hence the course name is changed as Acoustics & Speech Processing	Included Acoustics and the course name is changed as Acoustics & Speech Processing
10.	Dr.E.S.Gopi, Ph.D., insisted to remove DSP Architecture and Programming course. Instead he suggested to include Pattern recognition and Computational Intelligence	Removed DSP Architecture and Programming course and included Pattern recognition and Computational Intelligence
11.	Dr. M. Sabarimalai Manikandan Ph.D., insisted to remove Multimedia Compression Techniques course. Instead he suggested to include Deep Learning	Removed the course Multimedia Compression Techniques. Included Deep Learning course
12.	Dr. M. Sabarimalai Manikandan Ph.D., suggested to include SONAR along with RADAR. So, the course name is changed to RADAR & SONAR Signal Processing	Included SONAR and the course name is changed to RADAR & SONAR Signal Processing
13.	Dr. M. Sabarimalai Manikandan Ph.D., insisted to remove Microprocessor and Microcontroller course. Instead he suggested to include Sensors and Control Systems.	Microprocessors are included in Microprocessor and Embedded Systems course. So, removed the course Microprocessor and Microcontroller. Included Sensors and Control Systems.
14.	Dr.E.S.Gopi, Ph.D., insisted to remove Bio-sensors and Instrumentation course. Instead he suggested to include MEMS & Nanoelectronics	Removed Bio-sensors and Instrumentation course. MEMS & Nanoelectronics course is included.
15.	Dr. M. Sabarimalai Manikandan Ph.D., suggested to remove the course RFID and include the topics of RFID and sensors in Internet of Things Course. Instead, basics of Wireless Technologies course may be included with various wireless technologies used for Sensor Technologies.	The course RFID is removed and included the topics of RFID and sensors in Internet of Things Course. Wireless Technologies Course is included.

16.	Dr. M. Sabarimalai Manikandan Ph.D., suggested to rename the course Communication Protocol and Network Security for IoT as Device and Data Security	Renamed the course Communication Protocol and Network Security for IoT as Device and Data Security
17.	Dr. M. Sabarimalai Manikandan Ph.D., suggested to rename the course Basic Electronics and its Applications as Analog Devices and Circuits.	The course Basic Electronics and its Applications is renamed as Analog Devices and Circuits.
18.	Dr.E.S.Gopi, Ph.D., and Dr. M. Sabarimalai Manikandan Ph.D., verified the syllabus of Machine Learning and Embedded Systems and insisted that machine learning and Embedded systems are two different courses and it is a dumped syllabus. Focus only on Machine Learning and the course name may be changed as Introduction to Machine Learning.	Machine Learning and Embedded Systems course is changed as Introduction to Machine Learning
19.	Dr. M. Sabarimalai Manikandan Ph.D., suggested to rename the course Electronic Product Design using PCB as Electronic System Design	The course Electronic Product Design using PCB is renamed as Electronic System Design
20.	Dr.E.S.Gopi, Ph.D., insisted the following regarding NPTEL • In R2020, Online course is a core course. If NPTEL is the online course, then in the transcript it may be printed as NPTEL course or the NPTEL course name (Which is chosen by the student). • If a student fails in NPTEL, it should not be considered as arrear if he compensates with subjects handled by the department. • Mentor role is very important in NPTEL course.	Dr.E.S.Gopi, Ph.D., was discussed in Academic Council meeting. It is decided that the NPTEL course name will be printed on the manuscript. If a student could not pass until the seventh semester, he has to write the theory course in VIII semester. The name of the theory course will be mentioned in the transcript.

BoS members approved the action taken in 6th BoS Meeting Minutes

007.03.00 : Discussion and approval of

007.03.01 : Proposed Curriculum and Syllabi for VII and VIII Semester

VII Semester

Name of the Course	Suggestions from BoS members
Universal Human Values and Ethics	Approved the course and syllabus
Statistical Theory of Communication	Approved the course and syllabus

VIII Semester

Name of the Course	Suggestions from BoS members
Project Work	Approved the course

007.03.02 : List of Open Elective 1,2,3 & 4 courses offered

Name of the Course	Offered to	Suggestions from BoS members
Fundamentals of Electronic Devices and Circuits	CSE, IT, ADS, EEE, Mechanical, Civil, Mechatronics and Bio-Technology	1. Dr.M.Sabarimalai Manikandan Ph.D., suggested that instead of wave shaping circuits, include linear Integrated circuits using op-amp with the topics of Integrator, Differentiator, differential amplifier and Instrumentation amplifier. 2. Also he insisted to frame the new course as combine as follows. Unit I with Unit III contains special diodes. Add Basics of Digital Electronics as Unit V can be included with the topics of combinational and sequential circuits. For the digital electronics unit the text book "Digital Fundamentals" authored by, Thomas L. Floyd may be included.
Telecommunication Network Management	CSE, IT, ADS, EEE, Mechanical, Civil, Mechatronics and Bio-Technology	1. Dr.M.Sabarimalai Manikandan Ph.D., suggested that Telecommunication Network Management course may be replaced with "Sensors and Wireless Technologies" course because Telecommunication Network Management course is the outdated one. 2. They also insisted to frame the new course as, Unit I & Unit II can be framed with Sensors topics, Unit III - Basic Modulation scheme, Unit IV-Wireless Radios and standards including the topics of Wifi, Bluetooth, Zigbee, LoRa, RFID, LTE, Wimax,5G and Unit V with Wireless Network Topologies - Ring, Star, Mesh, Bus and ISO model.

VLSI Design	CSE, IT, ADS, EEE, Mechanical, Civil, Mechatronics and Bio-Technology	1. Dr.M.Sabarimalai Manikandan Ph.D., and Dr.E.S.Gopi, Ph.D., suggested that VLSI Design course is tough for other department students. So, they insisted to change the course as MEMS & VLSI. 2. They also insisted to frame the new course as follows. Digital Logic as Unit I covered with topics of Basic logic families. CMOS VLSI as Unit II, Unit III and Unit IV may be covered with MEMS concepts. Verilog programming as Unit V with programming of Analog & Digital Design. More weightage may be given for programming.
Industrial IoT and Industry 4.0	CSE, IT, ADS, EEE, Mechanical, Civil, Mechatronics and Bio-Technology	Dr.M.Sabarimalai Manikandan Ph.D., suggested to change the Industrial IoT and Industry 4.0 course title into Industry 4.0. Unit I title is changed as Introduction to Industry 4.0. Unit II may be based on IoT Components. Unit III Security Systems is about autonomous vehicles. Unit IV may be Data Analytics and Imaging Systems.
Medical Electronics	CSE, IT, ADS, EEE, Mechanical, Civil, Mechatronics and Bio-Technology	Dr.M.Sabarimalai Manikandan Ph.D., insisted to combine Unit I and Unit II. He also insisted that in Unit II, include topics under Medical Imaging Modalities such as X-ray, CT Scan, PET, Magnetic Resonance Imaging Systems, Ultrasonic Imaging Systems. Rangaraj M Rangayyan, 'Biomedical Signal Analysis-a case-study approach' may be included as one of the reference books

- Dr. E. S. Gopi, Ph.D., insisted that for all the open elective courses must be self-explanatory.
- Dr. E. S. Gopi, Ph.D., and Dr. M. Sabarimalai Manikandan Ph.D., insisted to add Introduction to Signal Processing as one of the open elective courses.

007.03.03 : List of courses for PhD candidates

Name of the Course	Suggestions from BoS members
Advanced Design of Experiments	Approved the course and syllabus
Big Data	Approved the course and syllabus
Deep Learning	Approved the course and syllabus
Machine Learning	Approved the course and syllabus
Internet of Things	Approved the course and syllabus

- Dr. E. S. Gopi, Ph.D., and Dr. M. Sabarimalai Manikandan Ph.D., suggested to include Linear Algebra, Probability and Statistics, Numerical Methods and Computing and more courses for PhD course works

007.03.04 : Human Values and Ethics Courses

Name of the Course	Suggestions from BoS members
Universal Human Values and Ethics	Approved the course and syllabus

007.04.00 : ITEMS FOR RATIFICATION

007.04.01 : Changes or Corrections in the existing Curriculum of R2020 and R2021

Existing	Corrections required and specify the reasons
Mini Project, R2021	To move from VII semester to VI semester because it will be helpful for students placement in VII semester.
Statistical Theory of Communication, R2021	To move from VII semester to VI semester
EC2352/Microprocessor and Embedded Systems, R2021	To move from VI semester to VII semester
EC2353/Microprocessor and Embedded Systems laboratory, R2021	To move from VI semester to VII semester

007.04.02 : NPTEL Examination results (students performance) and action taken for the students who did not receive the certificates

- Students have to complete two 3 credits NPTEL courses mandatorily for R2020 curriculum.
- In IV ECE (2021-2024 Batch) under R2020, total number of students in the class is 61. In that, 3 students have cleared 3 courses, 48 students have completed 2 courses, 6 students have completed 1 course and 4 students didn't complete any of the NPTEL courses.

NPTEL Online Exam (January to April 2022)

Sl.No	Course Id	Course Title	Offered Institute	No. of Students Registered	No. of Students attended	No. of Students passed	No. of Students failed	Pass %
1	noc22-ee45	Digital System Design	IIT Ropar	61	61	24	37	39.34

NPTEL Online Exam (July to October 2022)

Sl.No	Course Id	Course Title	Offered Institute	No. of Students Registered	No. of Students attended	No. of Students passed	No. of Students failed	Pass %
1	noc22-hs76	Soft Skills	IIT, Roorkee	58	58	48	10	82.75
2	noc22-cs96	Introduction to Internet of Things	IIT, Kharagpur	10	10	10	--	100

NPTEL Online Exam (January to April 2023)

Sl.No	Course Id	Course Title	Offered Institute	No. of Students Registered	No. of Students attended	No. of Students passed	No. of Students failed	Pass %
1	noc23-mg33	Principles of Management	IIT, Roorkee	23	23	9	14	39.1
2	noc22-cs96	Introduction to Internet of Things	IIT, Kharagpur	25	25	20	5	80

Action Plan

- 6 students (1 course completed) + 4 (No Courses Completed) who failed in the registered subjects have to compensate with the subjects Softskills / IoT for this semester in NPTEL.
- Mentors are asked to monitor the assignment submissions of students.

007.04.03 : Curriculum feedback and action taken if any

- Collected the curriculum feedback from the students and action plan is being carried out.
- Dr. E. S. Gopi, Ph.D., insisted not to collect curriculum feedback from students, instead other stake holders feedback must be collected.

007.04.04 : Value Added Courses offered – ratification

The following are the value added courses conducted for the III year students in the academic year 2023-2024.

S. No.	Course Name	Resource Person	Participants	Date
1.	Value Added Course on Deep Learning	Mr.R.Ramachandran, Pantech eLearning Pvt Ltd.,	III ECE – 20 students	31st July 2023 to 05th August 2023
2.	Value Added Course on IoT Application Design using Raspberry Pi and Python	Mr.R.Jegadeswaran, Enthu Technology Solutions India Pvt Ltd.	III ECE – 20 students	31st July 2023 to 05th August 2023
3.	Value Added Course on The Internet of Things using LoRaWAN Technology	Dr. Subramaniam Enthu Technology Solutions India Pvt Ltd.	III ECE – 20 students	31st July 2023 to 05th August 2023

BoS members approved the Value added courses conducted.

007.05.00: Information about the (Points Discussed in the following)

Item No.	Description	Suggestions / Comments from the BoS Members
007.05.01	Number of students doing Honours/ Honours with Specialization Minors and its respective courses	The HOD Presented the number of students doing Honours/ Honours with specialization/ Minors and its respective courses …. 1. Honors with Specialization degree-Semiconductor Chip Design and Testing-10 2. Honors with Specialization degree-Sensor Technologies and IoT-2 3. Honors degree – 9 4. Minor degree- Computing Technology-13
007.05.02	Student Internship Completion details	The HOD shared the statistical data of the student internship/ Inplant training details for R2020 & R2021 - All the 61 students of IV ECE (R2020) have completed. - All the 60 Students of III ECE (R2021) have completed.
007.05.03	Pass Percentage of students	The HOD Presented the Pass percentage yearwise and course wise for the academic year 2022-2023 (Even). II Year- Pass percentage -76.67% III Year- Pass percentage – 88.53% IV Year- Pass percentage – 100%

007.05.04	Value Added Courses offered/ Planned for the academic year : 2023 – 2024	The HOD Presented the Value added course planned for II year students for the academic year 2023-2024 1. Integrated Full stack web development with IoT Networks 2. IoT Applications using Node MCU and Raspberry Pi 3. Machine Learning using Python
007.05.05	NBA eSAR / status /compliance preparation and its information	The HOD happily shared the NBA eSAR / Status On 09.04.2023 – NBA Compliance audit was held. Received NBA reaccreditation extended for three years (July 2023- July 2026)
007.05.06	Department achievements between 6th and 7th BoS	HoD happily shared the department, student and faculty achievements with the BoS members.

007.06.00 : Any other Item

- Next BoS Meeting is tentatively scheduled on March 2024.

007.07.00 : Vote of Thanks

- The meeting ended with the Vote of Thanks by Dr.S.Nisha Rani, Assistant Professor, Department of Electronics and Communication Engineering, Kamaraj College of Engineering and Technology, Virudhunagar.

6/10/2023

BoS Coordinator

Dr.S.Nisha Rani, AP/ECE

6/10/2023

BoS Chairman

Dr.R.Suresh Babu

HoD / ECE

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COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Three Member Committee Meeting Minutes

Date of the Meeting: 8/02/2024 **Time:** 4:15p.m

Venue: Department Library

Agenda: Conduct of Value Added Course for II ECE students.

Member 1 - Head of the Department - Dr.R.SureshBabu

Member 2 – Course Incharges - Dr.N.M.Mary Sindhuja & Mrs.P.Muthumari

Member 3 – Class Chairperson -Dr.T.Prathiba

In the 3 Member Committee meeting the following points were discussed.

1. Discussed about the syllabus given by Pantech e learning.
2. The three-member committee decided that the Value added course on **" EMBEDDED IOT WITH NODE MCU AND RASPBERRY PICO"** can be given during the 2023 – 2024 Even semester for 2022 – 2026 Batch students.
3. Decided to conduct the Value-Added Course from 12.02.2024 to 17.02.2024.
4. Decided to conduct Mini Project contest after the completion of the course as the Internal Assessment tool.
5. Discussed about the venue of Value-added program can be in VLSI Lab (ECE LAB IV).

T. Prathiba
Chairperson
/ECE

P. Muthumari
Course In charges

R.J 22/4/24
HoD

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VALUE ADDED COURSE ON "EMBEDDED IOT WITH NODE MCU AND RASPBERRY PICO" REPORT

Course Date: 12/2/2024 to 17/2/2024 **Class:** II ECE

Venue: VLSI Lab

The value added program organized by Department of Electronics and Communication Engineering started on 12/2/2024 Monday morning at 9 AM with the warm welcome by Dr.N.M.Mary Sindhuja Associate Professor /ECE. The Inagural Address was given by Dr.R.Suresh Babu, HoD/ECE & Dean Academic Courses and shared the importance of value added courses. Mr.Ramachandran from Pantech Solutions acted as the resource person. The 32 II ECE students attended the value added course.

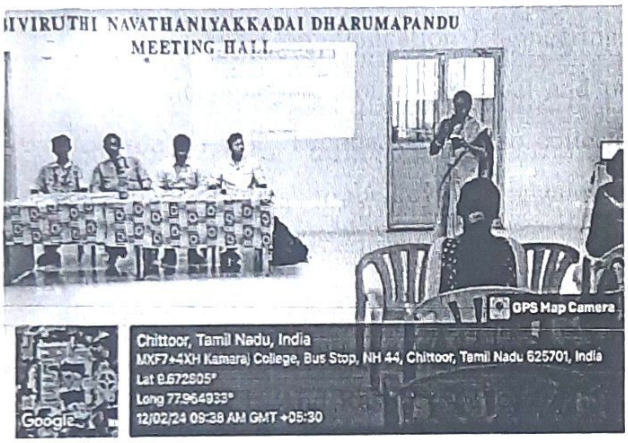
The Day1 schedule started at 10:00a.m on 12/2/2023. The session details for all the six days are given as below:

Date	Session	Topic Covered
12/2/2024	Forenoon	Introduction to Embedded Systems and the Overview of Applications
	Afternoon	Interface with Sound / DHT11 / IR Sensor
13/2/2024	Forenoon	Overview of Raspberry Pico Architecture and Setup
	Afternoon	Interface with Ultrasonic / LDR Sensor
14/2/2024	Forenoon	Overview of Node MCU and Configuration Interface with Gas /Water Level Sensor
	Afternoon	Raspberry Pico Configuration, GPIO Interaction
15/2/2024	Forenoon	Interface with PIR / / Soil Moisture Sensor
	Afternoon	Introduction to Communication Protocols: MQTT , Interface with DC motor
16/2/2024	Forenoon	Interface LED, Buzzer with Raspberry Pico Overview of Smoke Sensor
	Afternoon	Interface with I2C LCD Interface with Accelerometer
17/2/2024	Forenoon	Overview of servo motor Interface with Servo Motor
	Afternoon	HANDS and TRANING Connect Microcontroller with Wi-Fi ,Creation of ThingSpeak Account , Blynk IOT ,MQTT

The program spanned six days and catered to 32 students from the second year of Electronics and Communication Engineering. A total of 45 hours were dedicated to the course, encompassing both theoretical and practical sessions, as well as assessments and hands-on training. Feedback was also collected to ensure the effectiveness of the training. This course delves into the key highlights of the course, including the structured curriculum, hands-on projects, expert lectures, assessment criteria, participant feedback, and the future prospects it opens up for aspiring programmers.

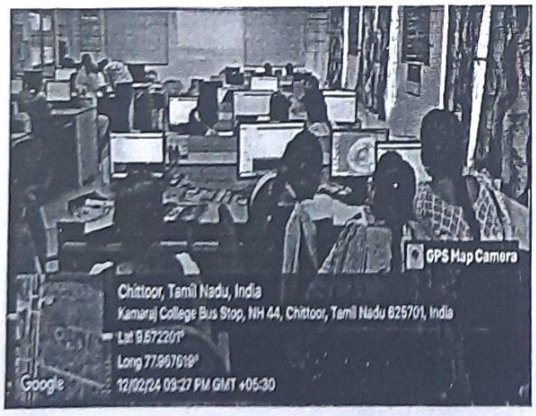
Overall, the course aimed to enhance the participants' proficiency in Embedded IoT With Node MCU And Raspberry Pico , equipping them with valuable skills and knowledge in the field.

Geo Tagged Photos

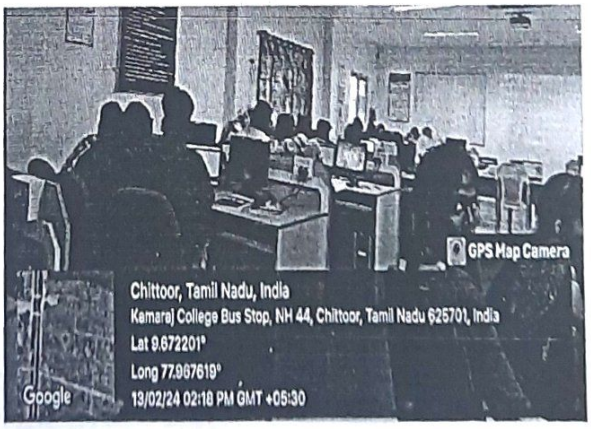


Welcome Address by Dr.N.M.Mary Sindhuja ASP/ECE

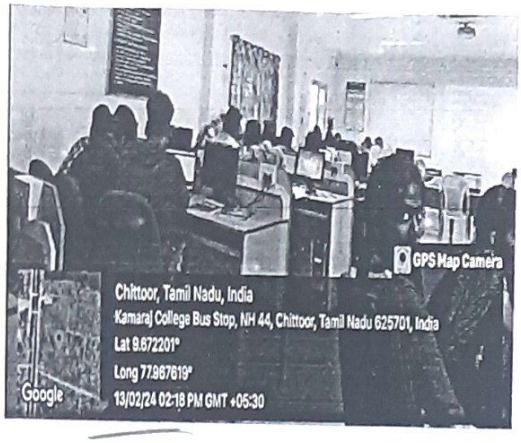
Inaugural Address by Dr.R.Suresh Babu HoD of ECE & Dean Academics



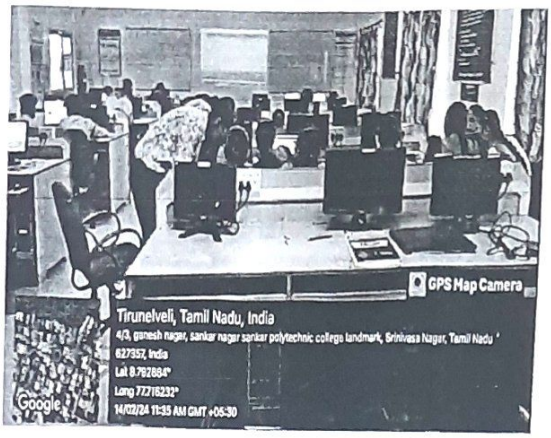
Students Attending the Course-Day 1



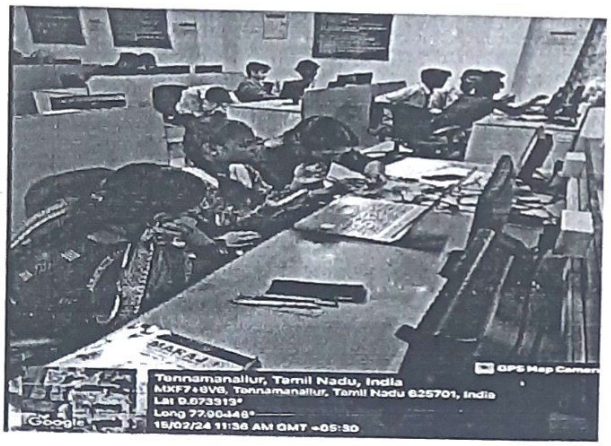
Students Attending the Course-Day 2



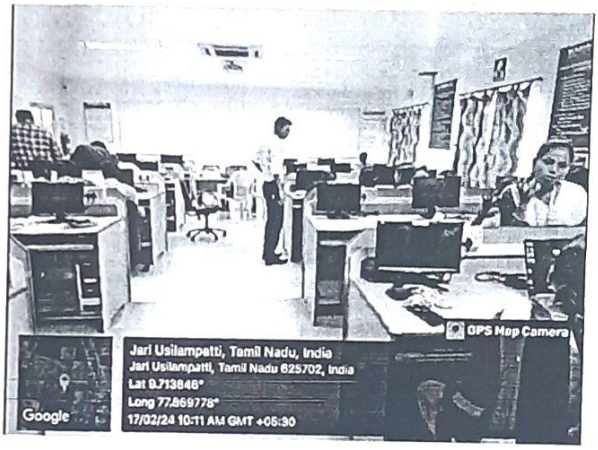
Students Attending the Course-Day 3



Students Attending the Course-Day 4



Students Attending the Course-Day 5



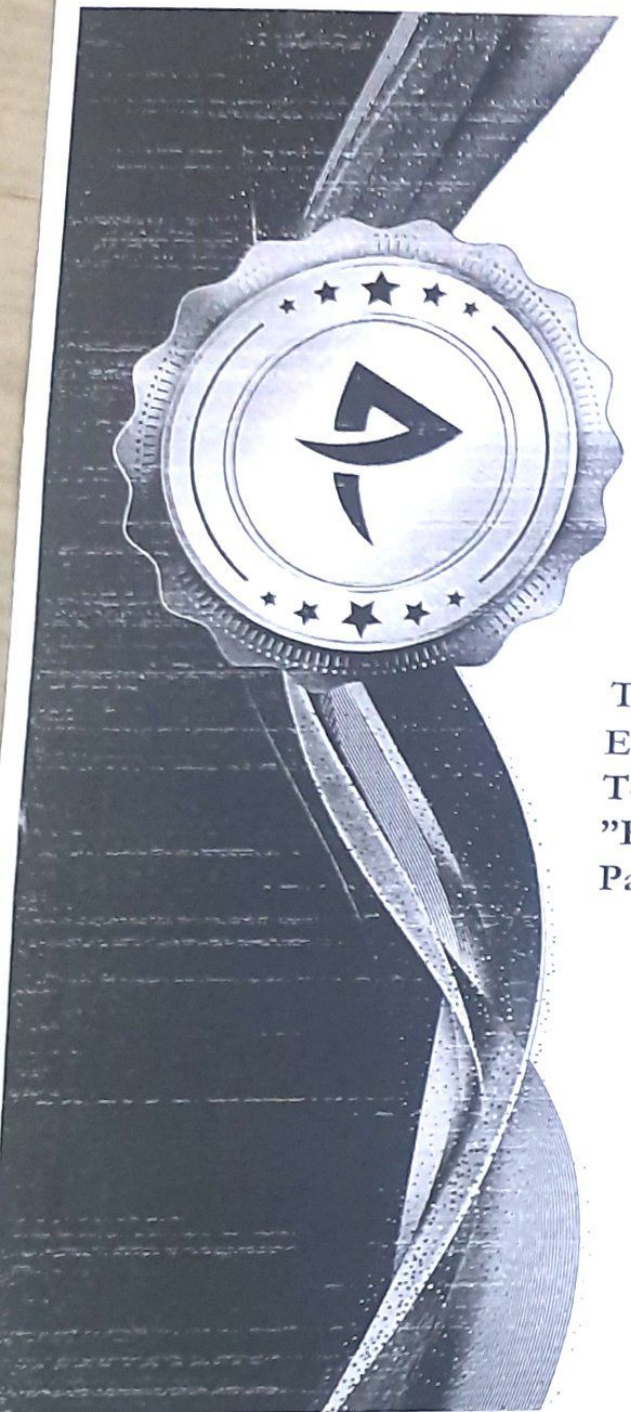
Students Attending the Course-Day 6

20/3/2024 P. Neji 20/3

Course In charges

20/3/24

HoD /ECE



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Exam Score : 55 /100

Mr. N. Srinivasan
Director
Pantech e-learning

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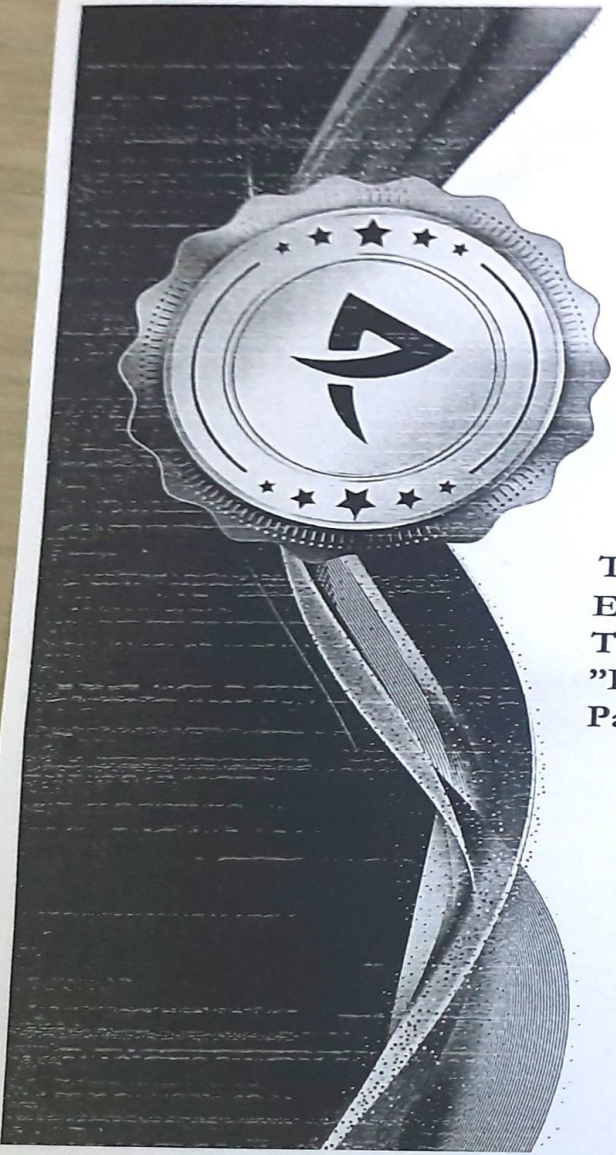
Exam Score : 59 /100

Mr. N. Srinivasan
Director
Pantech e-learning



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Exam Score : 72 /100

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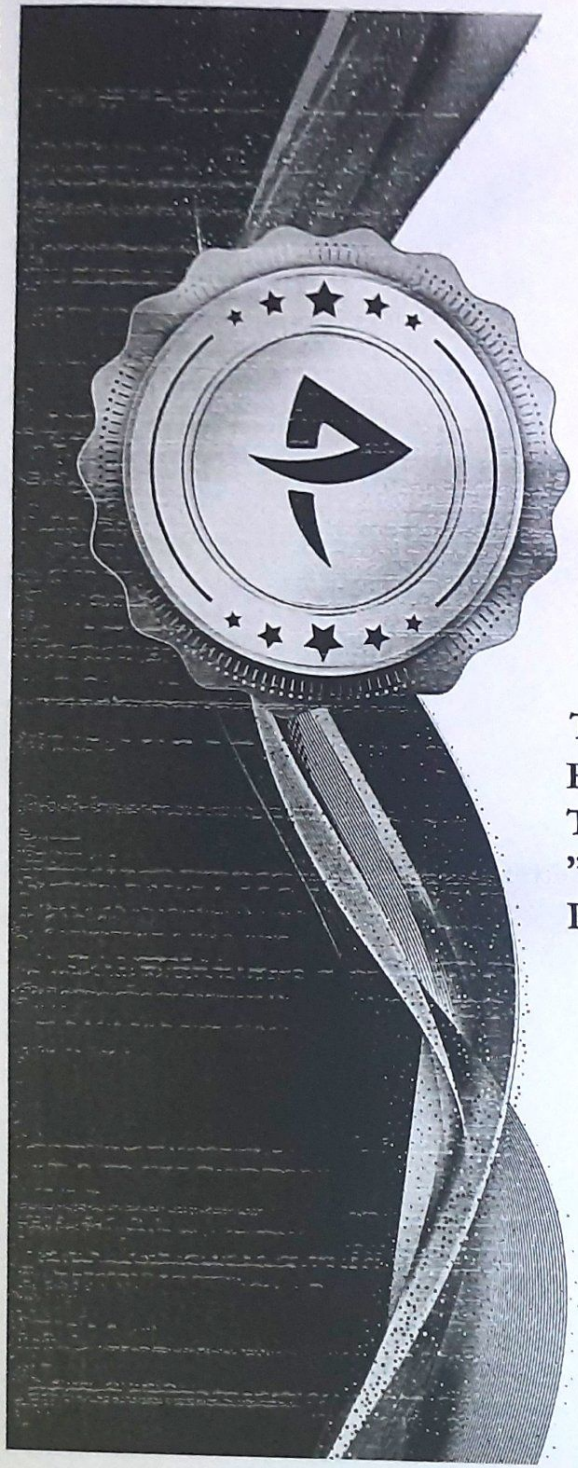
Director
Pantech e-learning



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Exam Score : 74 /100

Mr. N. Srinivasan
Director
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Exam Score : 64 /100

Mr. N. Srinivasan
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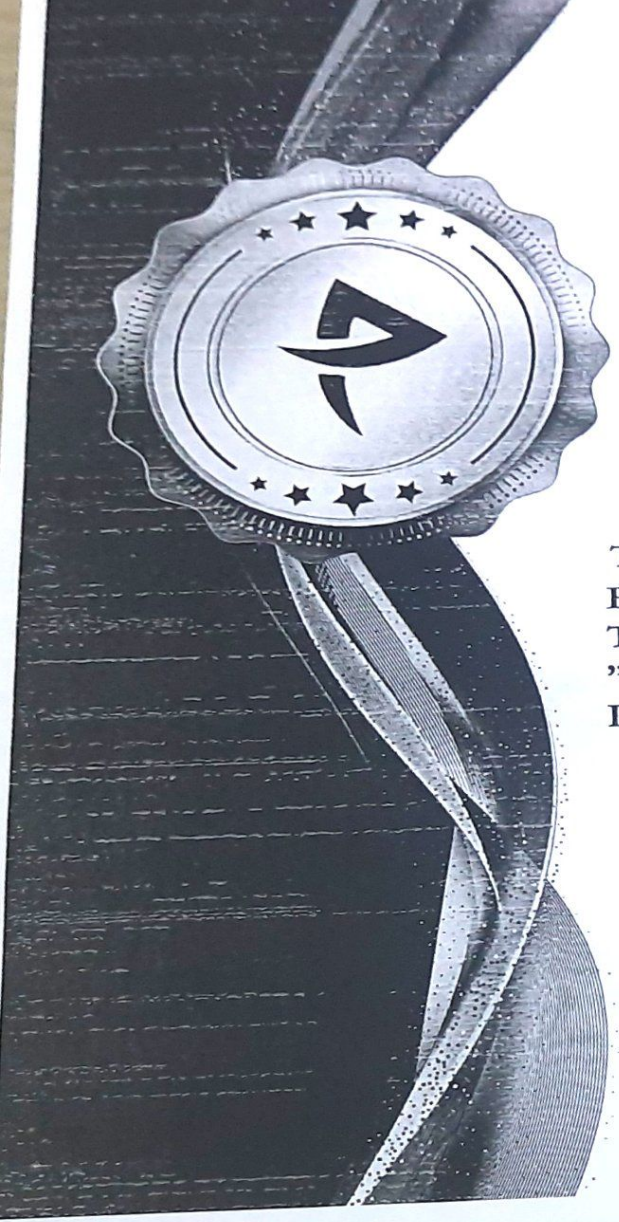

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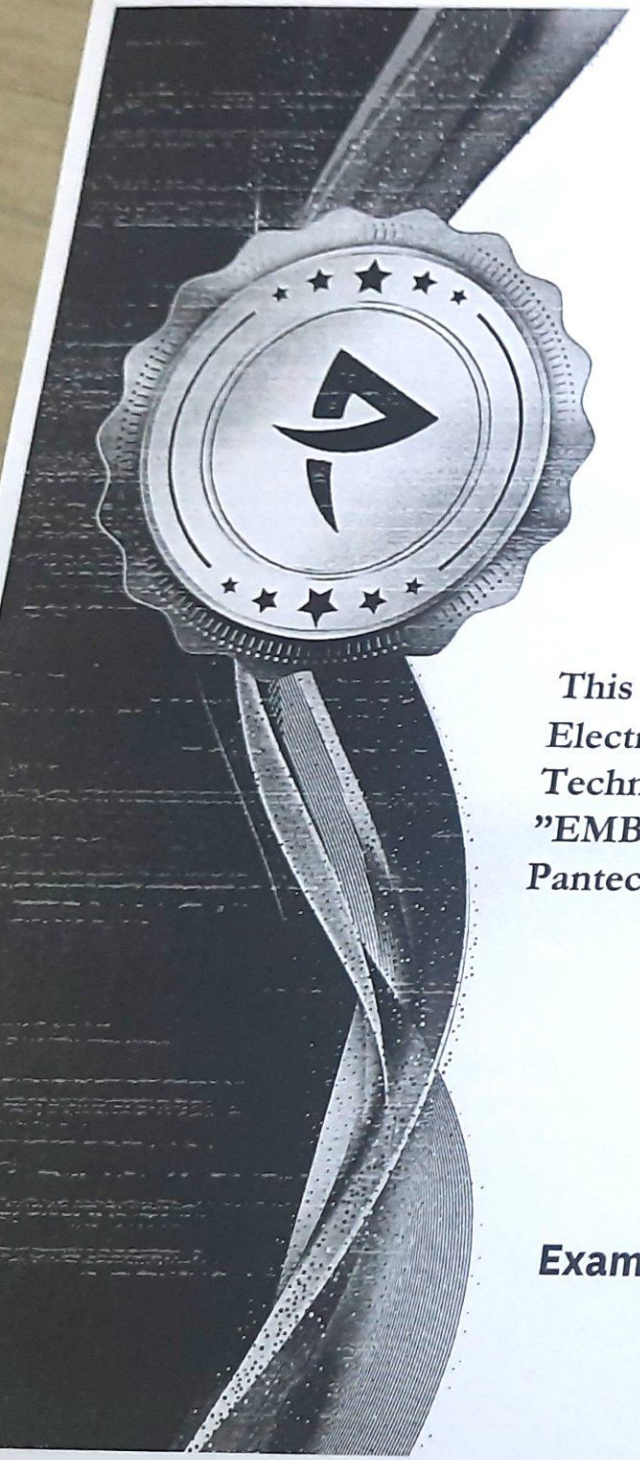

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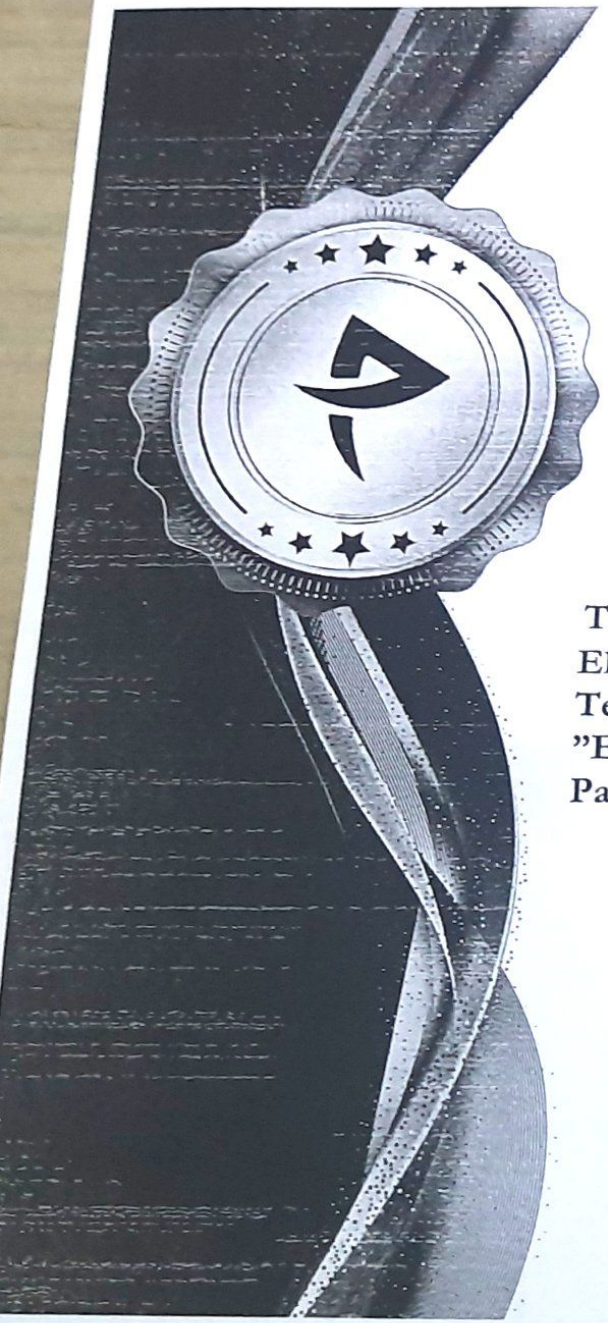
Exam Score : 69 /100

Mr. N. Srinivasan
Director
Pantech e-learning



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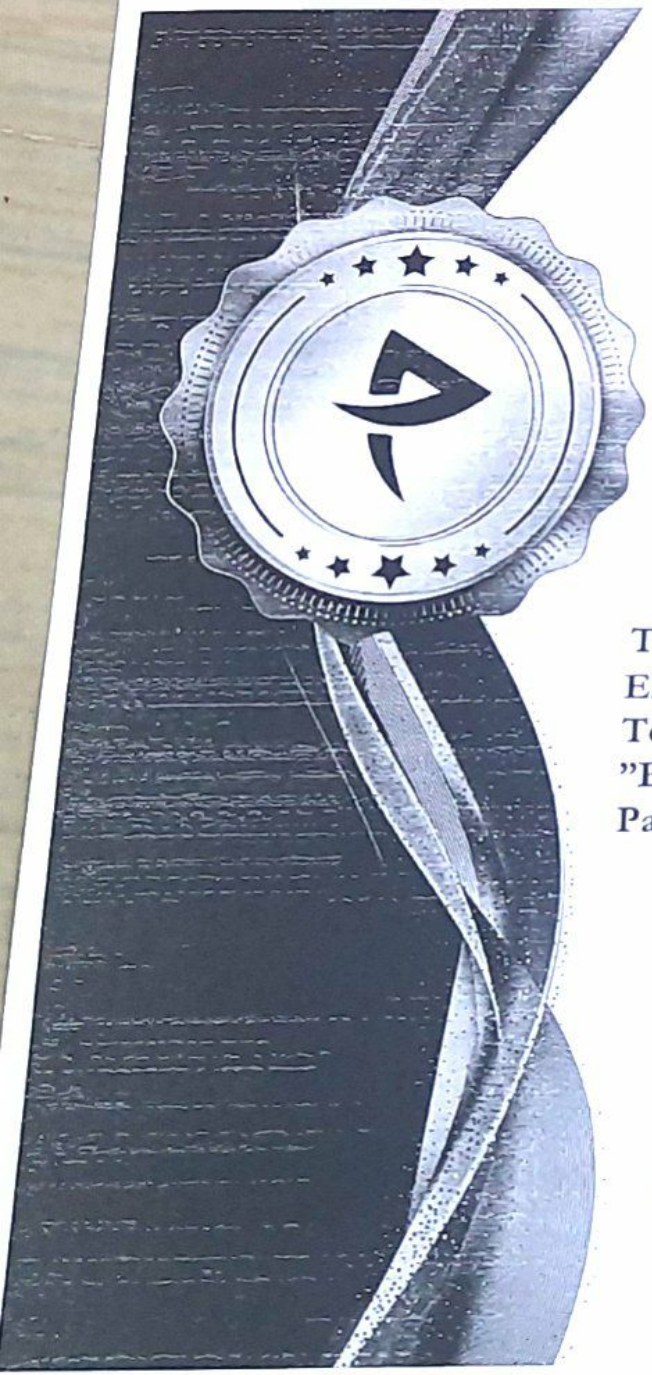
Pantech e-learning



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Exam Score : 71/100

Mr. N. Srinivasan
Director
Pantech e-learning

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This is to certify that Mr / ~~Ms.~~ PRADEEP KUMAR.S
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Exam Score : 61 /100

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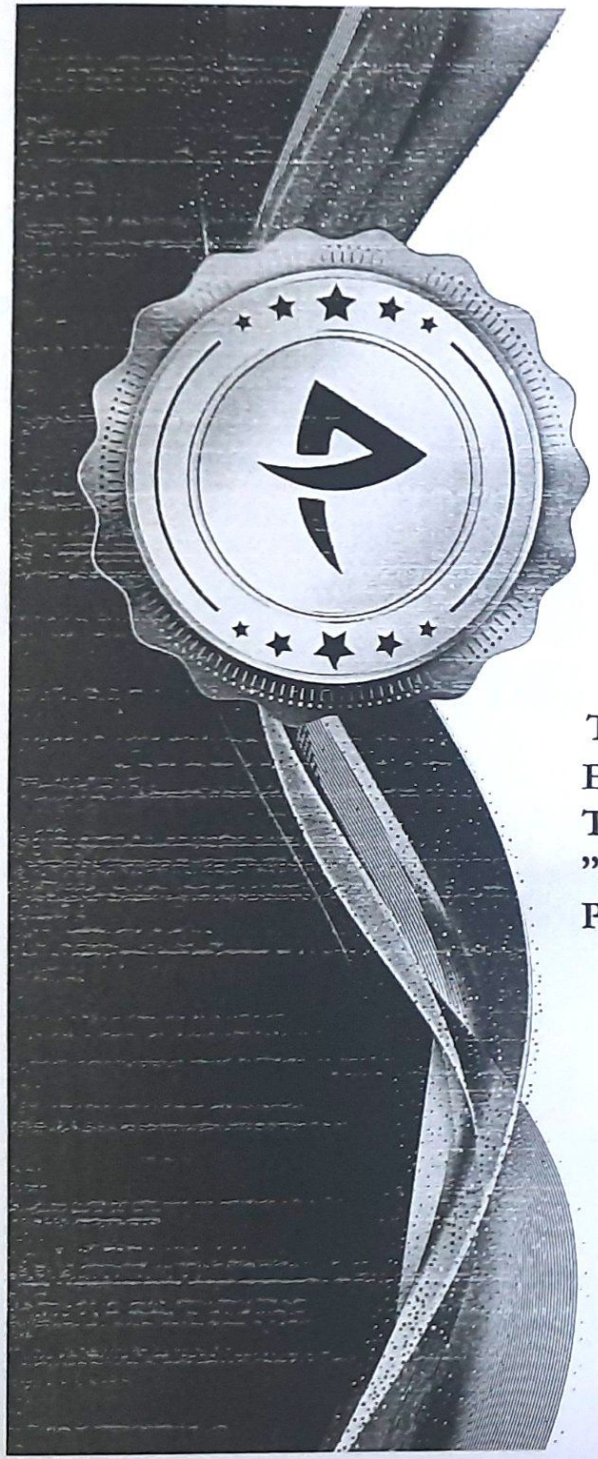
Mr. N. Srinivasan
Director
Pantech e-learning



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Mr. N. Srinivasan
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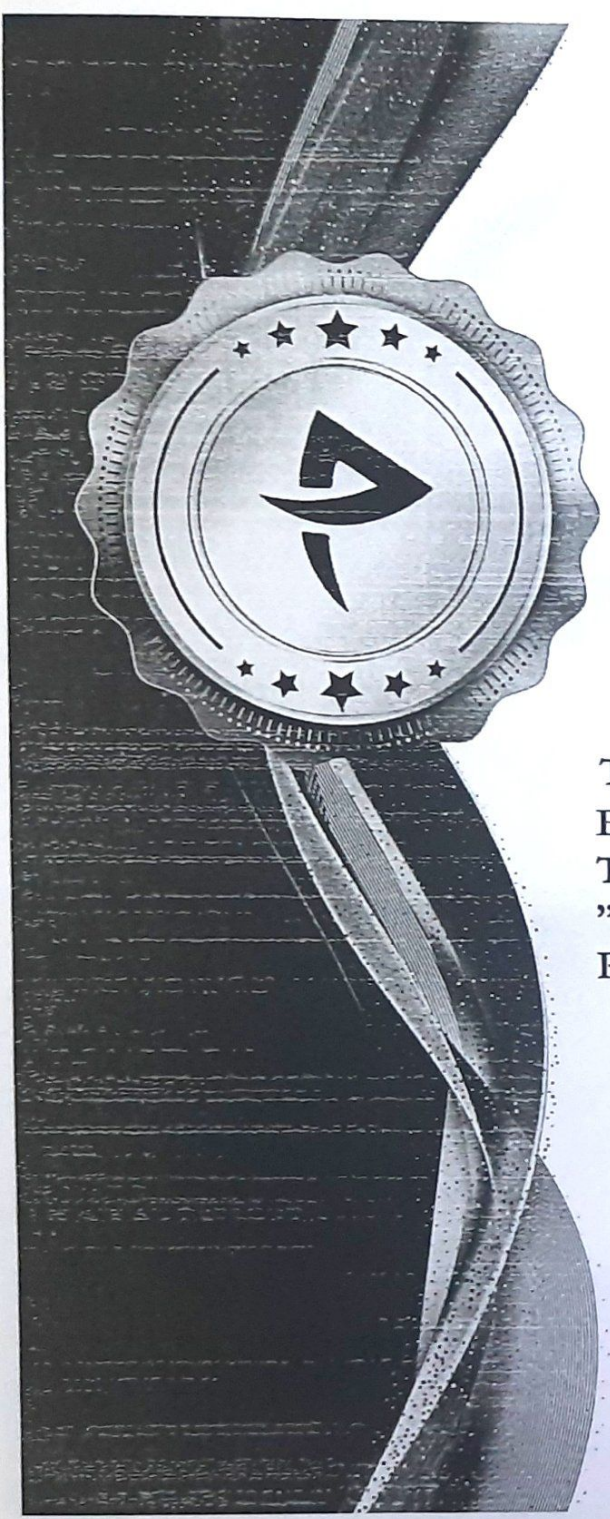

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Mr. N. Srinivasan
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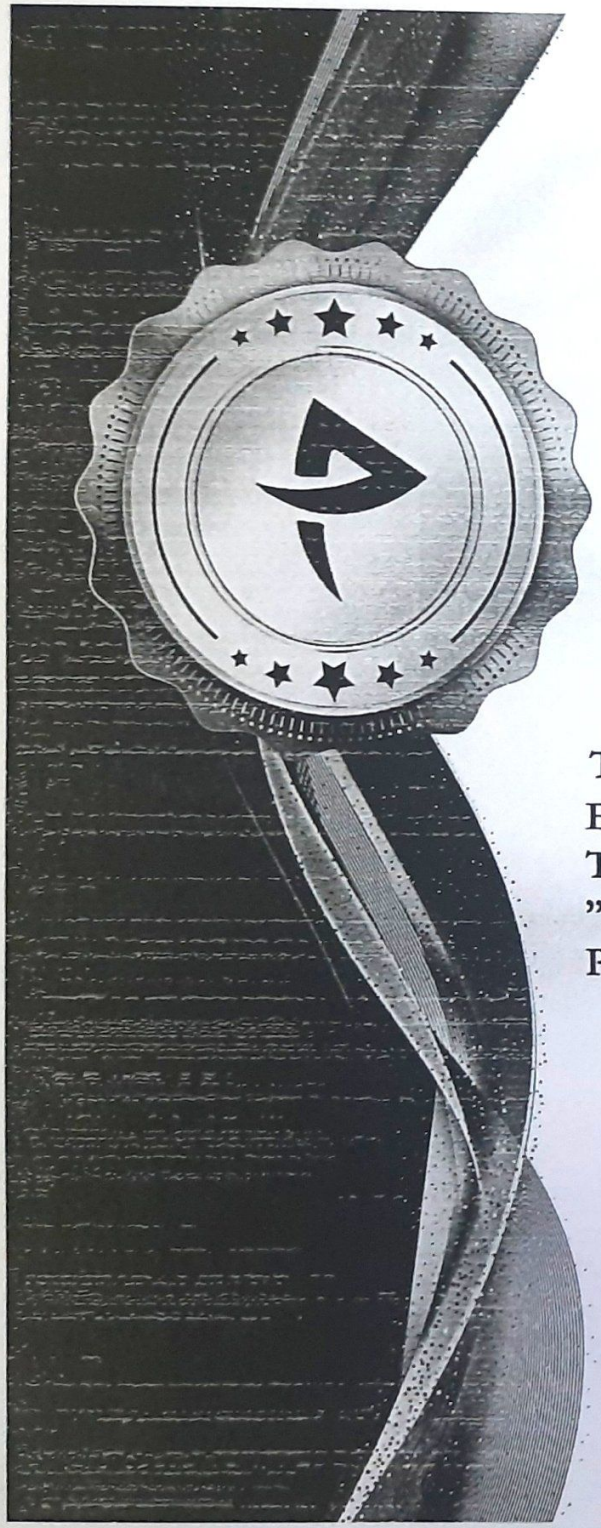
Director
Pantech e-learning



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Exam Score : 55/100

Mr. N. Srinivasan
Director
Pantech e-learning

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This is to certify that Mr / ~~Ms.~~ DHARUN VAISHNAV. S
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Exam Score : 57/100

Mr. N. Srinivasan
Director
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Exam Score : 66/100

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Director
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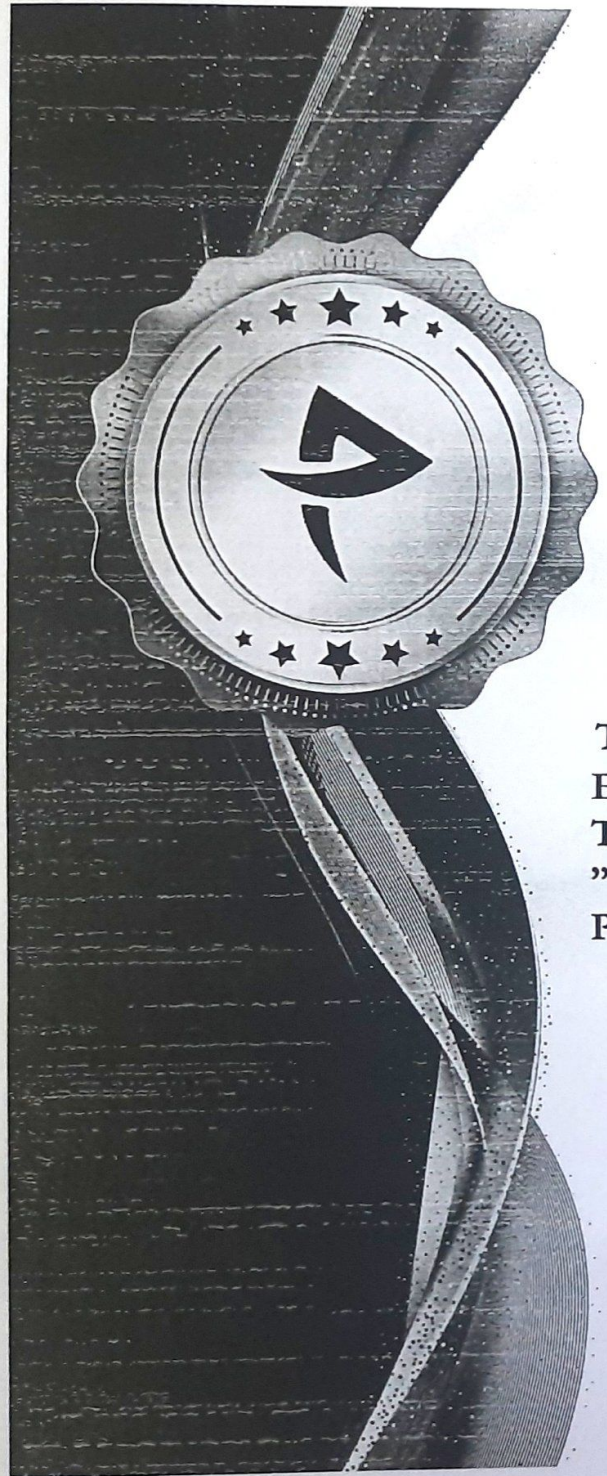

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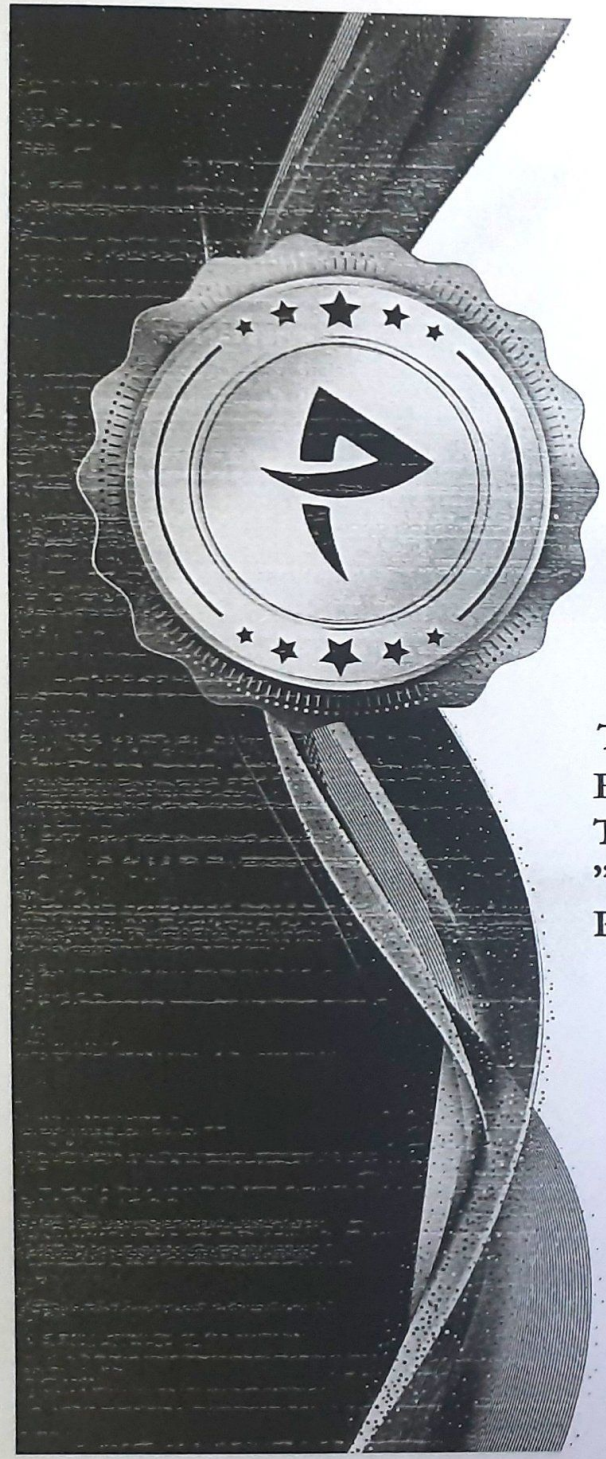
Mr. N. Srinivasan
Director
Pantech e-learning



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Exam Score : 69/100

Mr. N. Srinivasan
Director
Pantech e-learning

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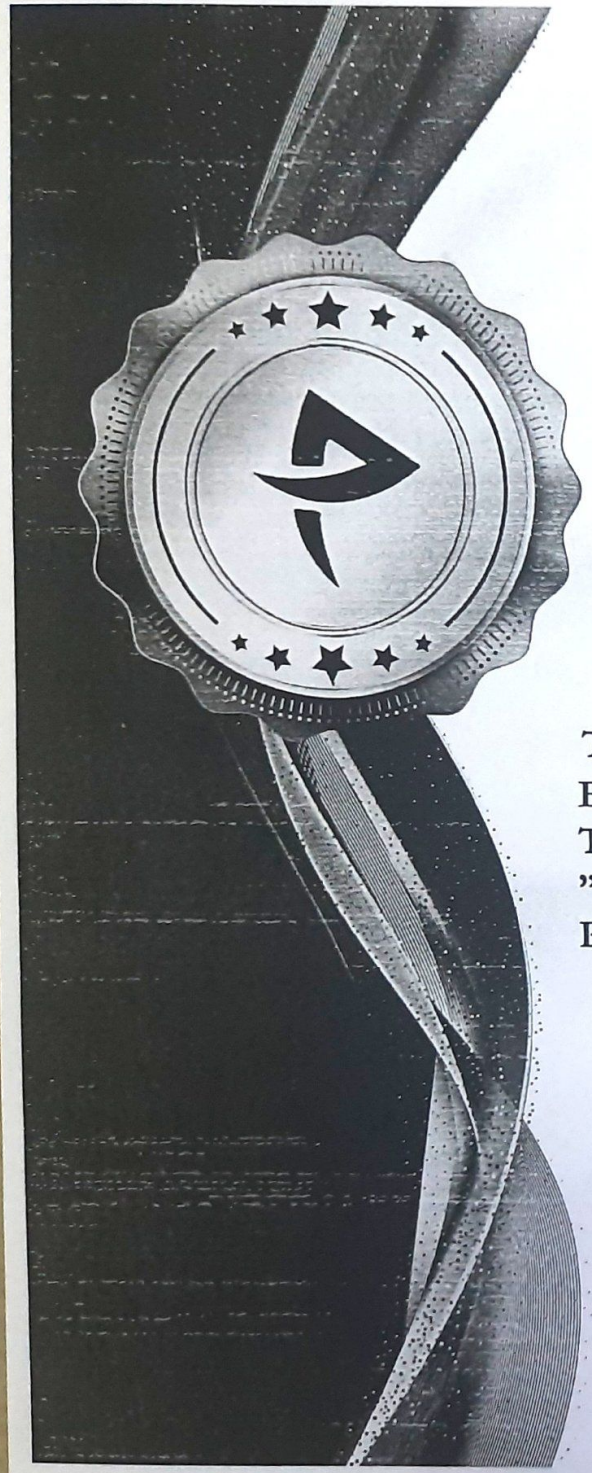
Pantech e-learning



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Exam Score : 78/100

Mr. N. Srinivasan
Director
Pantech e-learning

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Director
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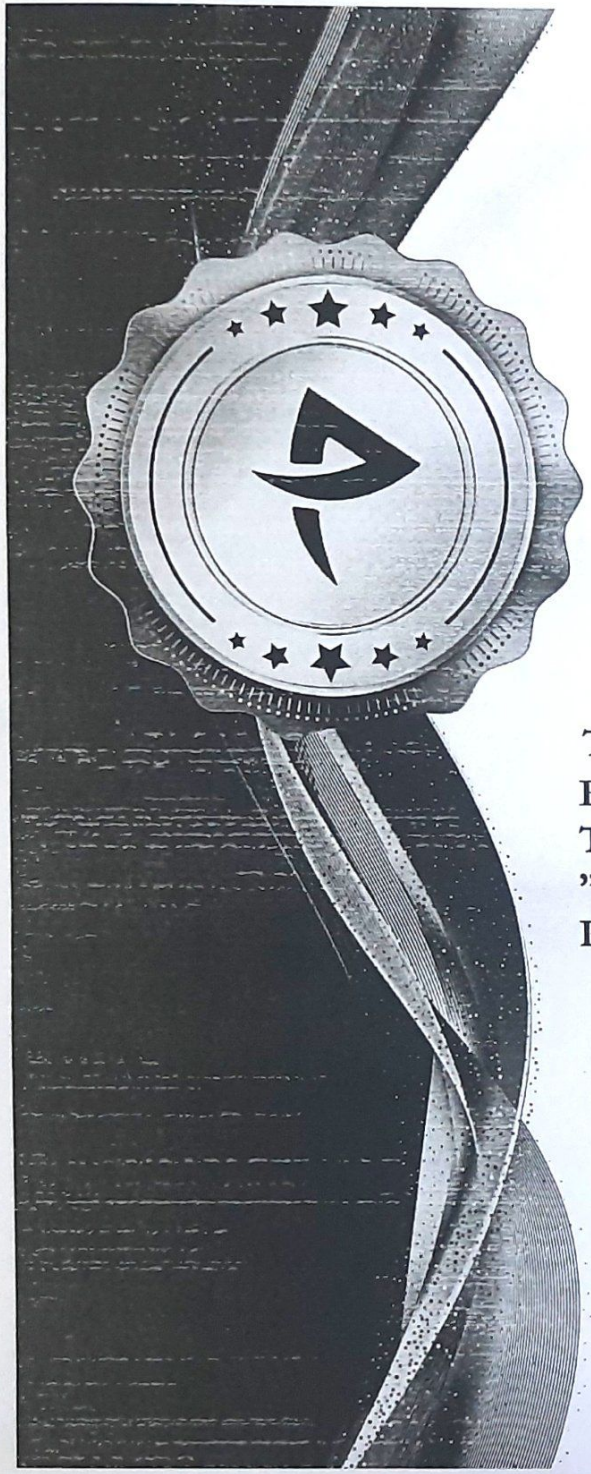

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Electronics And Communication Department of Kamaraj College of Engineering and Technology, Virudhunagar has successfully completed 5 days VAC courses on "EMBEDDED IOT WITH NODE MCU AND RASPBERRY PICO" organised by Pantech e-learning,Chennai from 12-02-2024 to 17-02-2024.

Exam Score : 73/100

Mr. N. Srinivasan
Director
Pantech e-learning

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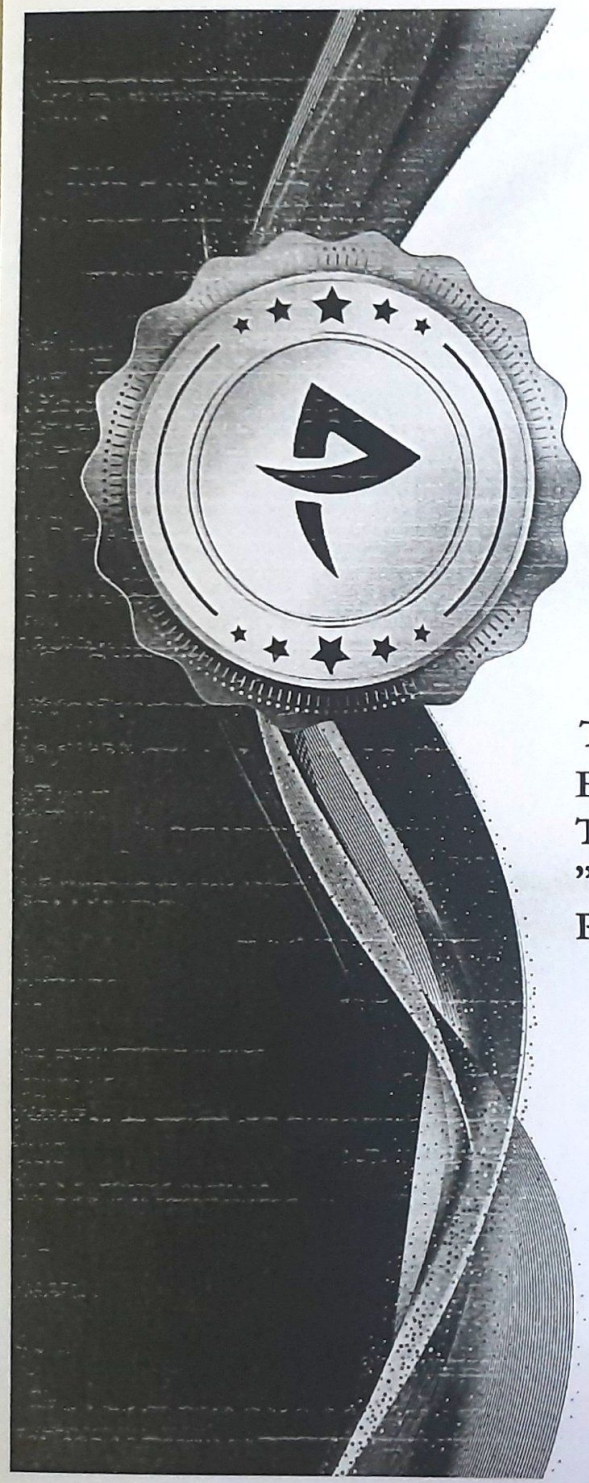
Exam Score : 63/100

Mr. N. Srinivasan
Director
Pantech e-learning



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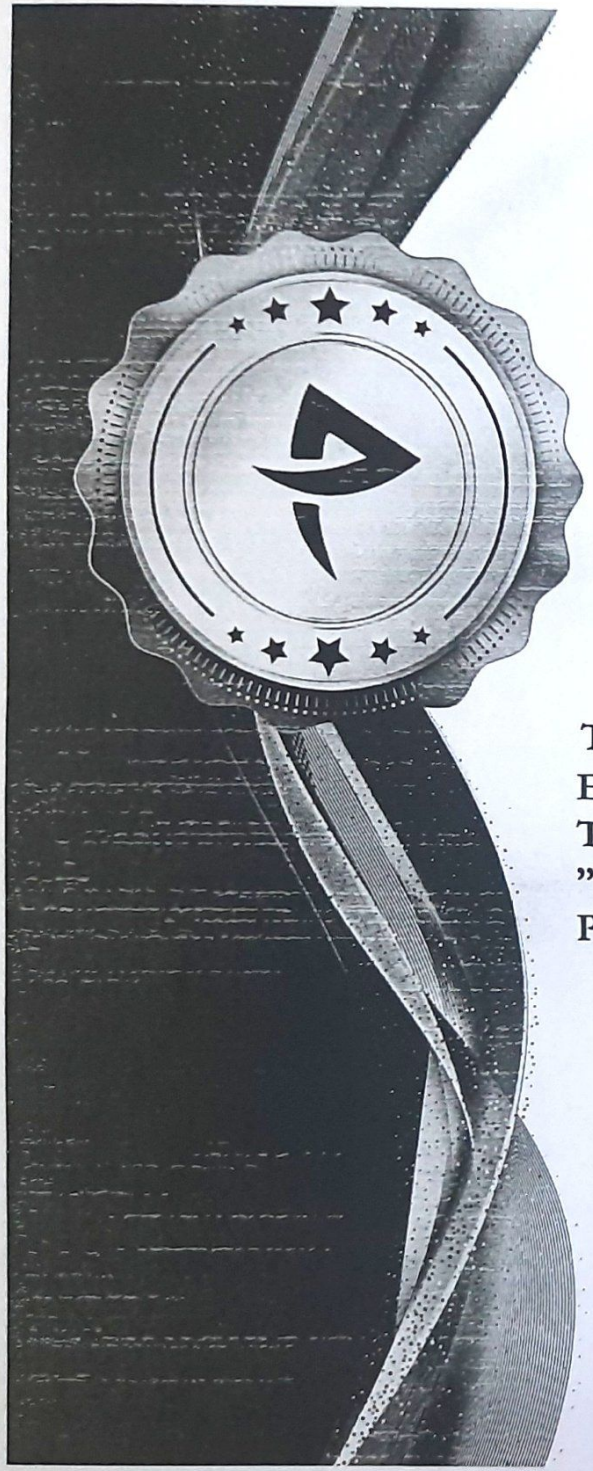
Exam Score : 64 /100

Mr. N. Srinivasan
Director
Pantech e-learning



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Exam Score : 72/100

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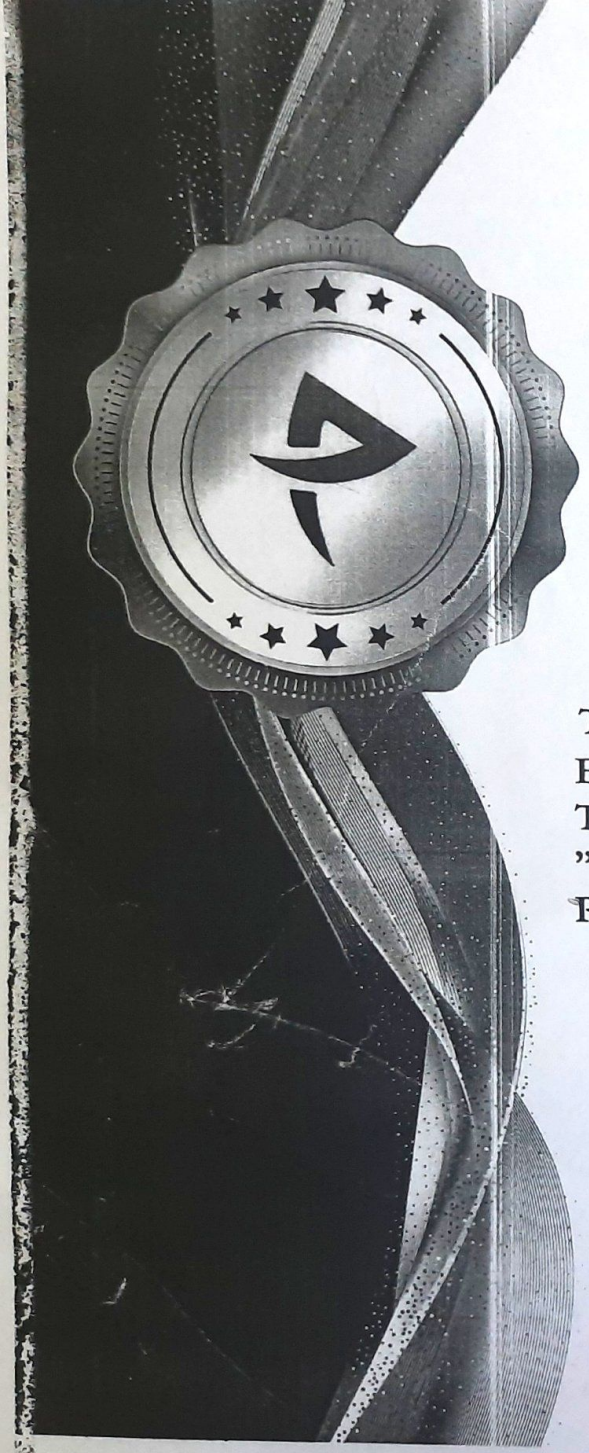

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Exam Score : 68/100

Mr. N. Srinivasan
Director
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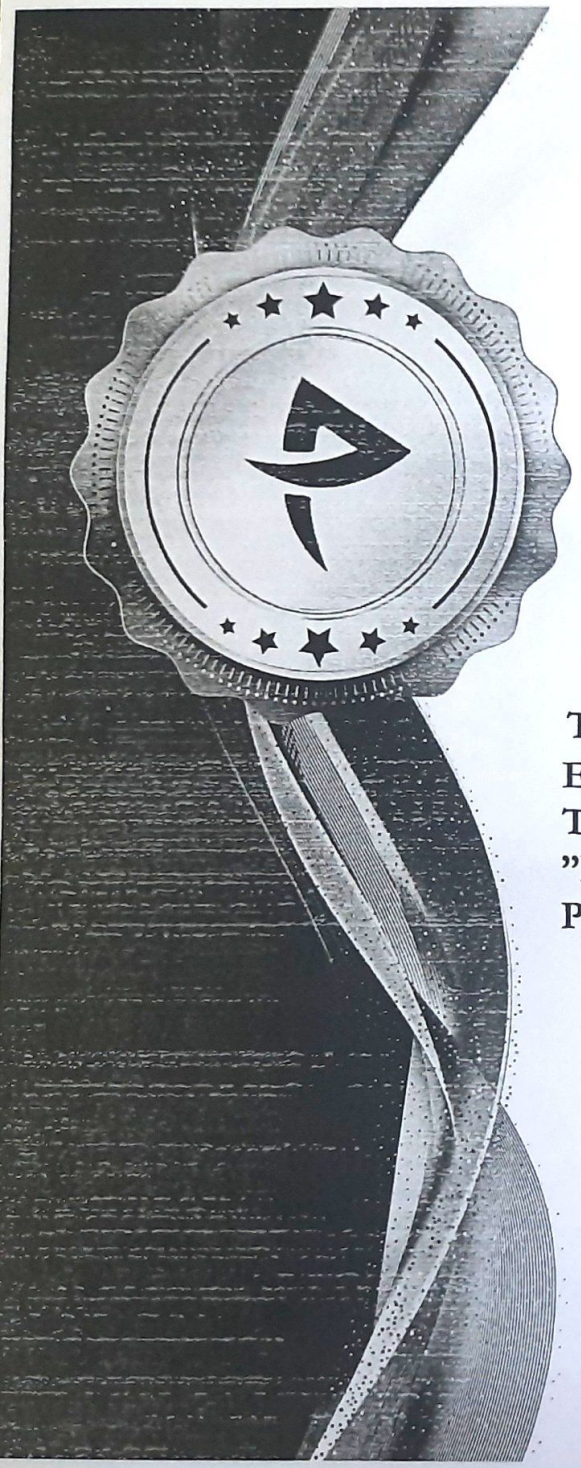

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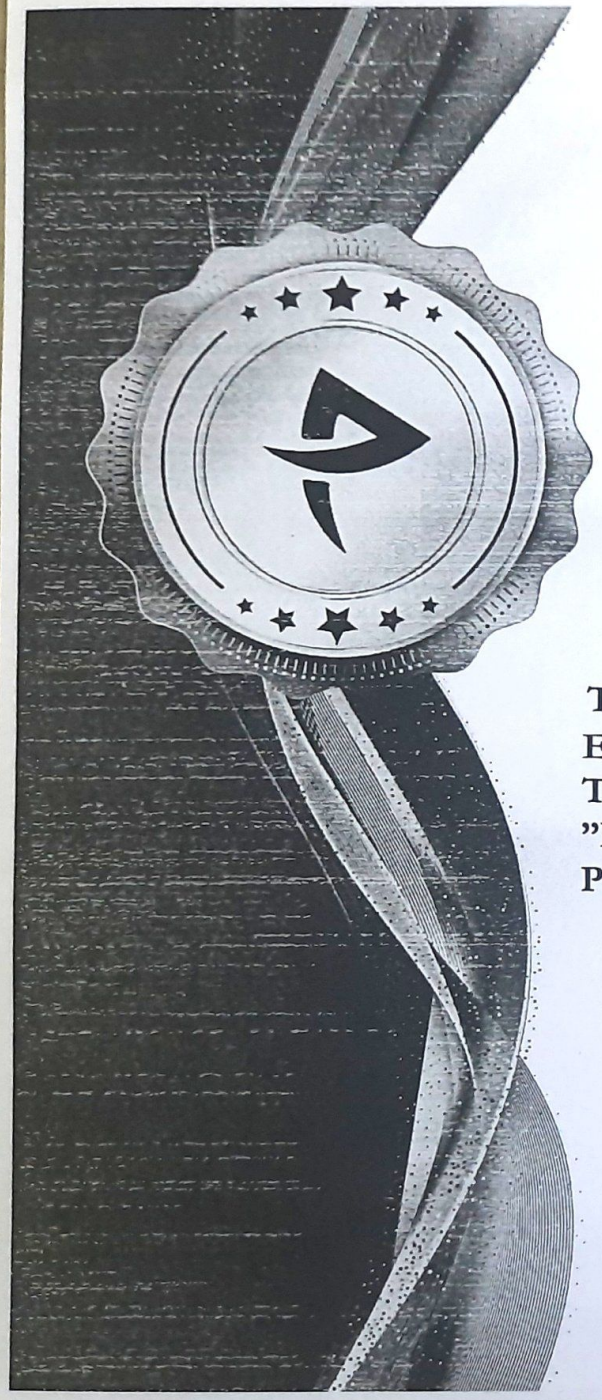
Exam Score : 77/100

Mr. N. Srinivasan
Director
Pantech e-learning



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This is to certify that Mr / ~~Ms~~. AMEER AJMAL.M.B
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Exam Score : 57/100

Mr. N. Srinivasan
Director
Pantech e-learning

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This is to certify that Mr / ~~Ms.~~ SANKAR. M.
Electronics And Communication Department of Kamaraj College of Engineering and Technology, Virudhunagar has successfully completed 5 days VAC courses on "EMBEDDED IOT WITH NODE MCU AND RASPBERRY PICO" organised by Pantech e-learning,Chennai from 12-02-2024 to 17-02-2024.

Exam Score : 56/100

Mr. N. Srinivasan
Director
Pantech e-learning

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This is to certify that Mr / ~~Ms.~~ DHANUSH. G
Electronics And Communication Department of Kamaraj College of Engineering and Technology, Virudhunagar has successfully completed 5 days VAC courses on "EMBEDDED IOT WITH NODE MCU AND RASPBERRY PICO" organised by Pantech e-learning,Chennai from 12-02-2024 to 17-02-2024.

Exam Score : 64 /100

Mr. N. Srinivasan
Director
Pantech e-learning

KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambaram Nadar - G.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR)

Department of Electronics and Communication Engineering

Value Added Course on "Embedded IoT with Node MCU and Raspberry PICO"

Duration: 12th to 17th February 2024

Venue: ECE Lab IV (VLSI Lab)

Attendance Sheet

S. No	Roll No	REGISTER NO	STUDENT NAME	12.02.2024		13.02.2024		14.02.2024		15.02.2024		16.02.2024		17.02.2024	
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN	FN	AN
1	22UEC004	920422106025	JERLACE SELIN E												
2	22UEC006	920422106020	HEMASRI S												
3	22UEC007	920422106055	VARSHA DEVI P												
4	22UEC011	920422106056	VENKATA HARISH S C												
5	22UEC012	920422106018	GANESAN B												
6	22UEC013	920422106031	MOHAMED IMRAN FARITH S												
7	22UEC014	920422106046	SANTHOSH KUMAR S												
8	22UEC015	920422106032	NAVEEN PRASATH S												
9	22UEC018	920422106051	SURYA B	ABSENT											
10	22UEC021	920422106006	ATCHAYA KARTHIKA S												
11	22UEC022	920422106030	MARIESWARI M												
12	22UEC023	920422106012	DHANUSHDEVA C												
13	22UEC024	920422106013	DHARSHINI V												
14	22UEC026	920422106043	RITHIKA J												
15	22UEC027	920422106028	KISHORKUMAR R												
16	22UEC028	920422106042	RESHMA R												
17	22UEC029	920422106002	ARCHANA P												

S. No	Roll No	REGISTER NO	STUDENT NAME	12.02.2024		13.02.2024		14.02.2024		15.02.2024		16.02.2024		17.02.2024	
				FN	AN	FN	AN	FN	AN	FN	AN	FN	AN	FN	AN
18	22UEC031	920422106045	SANKAR M												
19	22UEC034	920422106011	DHANUSH G	G.D	G.D	G.D	G.D	G.D	G.D	G.D	G.D	G.D	G.D	G.D	G.D
20	22UEC035	920422106014	DHARUN VAISHNAV S												
21	22UEC039	920422106015	DHESIKA K M S												
22	22UEC040	920422106022	IMMANUVEL L												
23	22UEC041	920422106058	VIVEKA S												
24	22UEC045	920422106053	TEJASWI R												
25	22UEC047	920422106001	AMEER AJMAL M B												
26	22UEC049	920422106057	VIMALRAJ S												
27	22UEC051	920422106034	PRADEEPKUMAR S												
28	22UEC052	920422106024	JENISHA S												
29	22UEC053	920422106005	ASHIF AHAMED J												
30	22UEC054	920422106047	SHRUTHIKA V												
31	22UEC055	920422106004	ARUN KUMAR M												
32	22UEC057	920422106017	EBBY ALLAN RAJ A												
33	22UEC033	920422106304	MEYYALAGAN M												

P. Nei

VAC Coordinators

20/2/24

Head of the Department

KAMARAJ COLLEGE OF ENGINEERING & TECHNOLOGY

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Department of Electronics and Communication Engineering

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15	22UEC028	920422106042	RESHMA R
16	22UEC029	920422106002	ARCHANA P
17	22UEC031	920422106045	SANKAR M
18	22UEC034	920422106011	DHANUSH G

S. No	Roll No	REGISTER NO	STUDENT NAME
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31	22UEC057	920422106017	EBBY ALLAN RAJ A
32	22UEC063	920422106304	MEYYALAGAN M

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HoD/ECE

MCQ-Assessment-Value Added Course on "Embedded IoT with Node MCU and Raspberry PICO"

* Required

* This form will record your name, please fill your name.

1. Which of the following is NOT a typical component of an IoT system? * (1 Point)

- ◯ Sensor
- ◯ Actuator
- ◯ Web browser
- ◯ Microcontroller

2. Which of the following types of water sensors is commonly used to prevent water damage in homes? * (1 Point)

- ◯ Capacitive water sensor
- ◯ Conductive water sensor
- ◯ Optical water sensor
- ◯ Ultrasonic water sensor

3. Which of the following devices is NOT commonly found in an I2C network? * (1 Point)

- ◯ Master
- ◯ Slave
- ◯ Peripheral
- ◯ Controller

4. What is an embedded system? * (1 Point)

- ◯ A system that relies solely on cloud computing
- ◯ A system designed to perform specific tasks within a larger system
- ◯ A system with no microcontroller or microprocessor
- ◯ A computer system with a large memory capacity

5. Which IoT application area focuses on optimizing energy usage in buildings? * (1 Point)

- ◯ Smart agriculture
- ◯ Industrial automation
- ◯ Smart cities
- ◯ Smart grid

6. What is the maximum data rate supported by standard I2C communication? * (1 Point)

- ◯ 100 kbps
- ◯ 400 kbps
- ◯ 1 Mbps
- ◯ 10 Mbps

7. What was the original purpose behind the development of the I2C protocol? * (1 Point)

- ◯ Interfacing microcontrollers with displays
- ◯ Communication between chips on a TV set
- ◯ Linking computers with peripherals
- ◯ Networking home appliances

8. In SPI communication, what is the role of the Chip Select (CS) signal? * (1 Point)

- ◯ It generates the clock signal for synchronization
- ◯ It indicates the start and end of data transmission
- ◯ It selects the specific slave device with which the master wants to communicate
- ◯ It controls the direction of data flow on the bus

9. What type of network topology is commonly used in IoT deployments with a centralized hub connecting multiple devices? * (1 Point)

- ◯ Star
- ◯ Mesh
- ◯ Bus
- ◯ Ring

10. What is the typical operating frequency range of LoRa devices in the India? * (1 Point)

- ◯ 433 MHz
- ◯ 868 MHz
- ◯ 915 MHz
- ◯ 2.4 GHz

11. What does I2C stand for? * (1 Point)

- ◯ Inter-Integrated Circuit
- ◯ Integrated 2 Circuits
- ◯ Interface-to-Computer
- ◯ Input/Output to Chip

12. What is the purpose of the "stop" condition in I2C communication? * (1 Point)

- ◯ Indicates the end of data transfer
- ◯ Resets the communication bus
- ◯ Forces a restart of the communication
- ◯ Marks an error condition on the bus

13. What is the purpose of MQTT (Message Queuing Telemetry Transport) in IoT? * (1 Point)

- ◯ Secure device authentication
- ◯ Real-time data streaming
- ◯ Device discovery
- ◯ Efficient message communication

14. Which wire in SPI is responsible for transmitting data from the master to the slave? * (1 Point)

- ◯ MOSI
- ◯ MISO
- ◯ SCK
- ◯ SS

15. Which of the following components is typically NOT integrated into a microprocessor chip? * (1 Point)

- ◯ Arithmetic logic unit (ALU)
- ◯ Control unit (CU)
- ◯ Random access memory (RAM)
- ◯ Input/output interfaces

16. Which memory type is non-volatile and commonly used for storing configuration data in embedded systems? * (1 Point)

- ○ SRAM
- ○ DRAM
- ○ Flash memory
- ○ EEPROM

17. Which device initiates the data transfer in SPI communication? * (1 Point)

- ○ Master
- ○ Slave
- ○ Peripheral
- ○ Controller

18. Which wireless communication protocol is commonly used for short-range IoT device communication? * (1 Point)

- ○ Zigbee
- ○ LTE
- ○ LoRa
- ○ WiMAX

19. Who developed the CAN protocol? * (1 Point)

- ○ Bosch
- ○ Intel Corporation
- ○ IBM
- ○ Motorola

20. In I2C communication, which device generates the clock signal? * (1 Point)

- ○ Master
- ○ Slave
- ○ Both master and slave
- ○ Peripheral

21. What is LiFi technology primarily used for? * (1 Point)

- ○ Wireless charging
- ○ High-speed data communication
- ○ Satellite communication
- ○ GPS tracking

22. In I2C communication, what is the role of the SDA (Serial Data) line? * (1 Point)

- ○ It carries the clock signal.
- ○ It carries the data signal.
- ○ It selects the slave device.
- ○ It synchronizes the clocks between master and slave.

23. Which of the following is NOT a type of sensor? * (1 Point)

- ○ Temperature sensor
- ○ Pressure sensor
- ○ Actuator sensor
- ○ Light sensor

24. What does IoT stand for? * (1 Point)

- ○ Internet of Transactions
- ○ Internet of Things
- ○ Internet of Technology
- ○ Intranet of Things

25. What is the primary application area of the CAN protocol? * (1 Point)

- ○ Home automation
- ○ Industrial automation and automotive systems
- ○ Wireless communication
- ○ Satellite communication

26. Who developed the I2C protocol? * (1 Point)

- ○ Robert Bosch GmbH
- ○ Philips Semiconductors (now NXP Semiconductors)
- ○ Intel Corporation
- ○ Texas Instruments

27. What is the main purpose of a water sensor? * (1 Point)

- ○ To measure water temperature
- ○ To detect the presence of water or moisture
- ○ To monitor water pressure
- ○ To analyze water quality

28. Which of the following is NOT a common IoT sensor type? * (1 Point)

- ◯ Temperature sensor
- ◯ Accelerometer
- ◯ Barcode scanner
- ◯ Light sensor

29. Which of the following is true about the "acknowledge" signal in I2C communication? * (1 Point)

- ◯ It indicates that the data was received successfully by the receiver.
- ◯ It indicates that the data was corrupted during transmission.
- ◯ It is sent by the master after receiving data from the slave.
- ◯ It is sent by the slave after receiving data from the master.

30. What is the typical operating voltage range for embedded systems? * (1 Point)

- ◯ 1.8V - 3.3V
- ◯ 3.3V - 5V
- ◯ 5V - 12V
- ◯ 12V - 24V

31. What is the typical data frame size in I2C communication? * (1 Point)

- ◯ 8 bits
- ◯ 16 bits
- ◯ 32 bits
- ◯ 64 bits

32. How many wires are used in SPI communication? * (1 Point)

- ○ 1
- ○ 2
- ○ 3
- ○ 4

33. What does "CAN" stand for? * (1 Point)

- ○ Central Area Network
- ○ Controller Area Network
- ○ Computer Area Network
- ○ Connection Area Network

34. What does SPI stand for? * (1 Point)

- ○ Serial Peripheral Interface
- ○ Simple Peripheral Interface
- ○ Serial Protocol Interface
- ○ Single Pin Interface

35. Who is often credited with coining the term "Internet of Things" (IoT)? * (1 Point)

- ○ Tim Berners-Lee
- ○ Bill Gates
- ○ Kevin Ashton
- ○ Mark Zuckerberg

36. What is the primary function of a microprocessor? * (1 Point)

- ◯ Execution of specific tasks or programs
- ◯ Control of external devices
- ◯ Real-time data processing
- ◯ Power management

37. What is the primary advantage of LoRa (Long Range) technology in wireless communication? * (1 Point)

- ◯ High data rate
- ◯ Low power consumption
- ◯ Short range communication
- ◯ High-frequency bands usage

38. How does LiFi transmit data? * (1 Point)

- ◯ Through radio waves
- ◯ Through infrared signals
- ◯ Through visible light
- ◯ Through microwaves

39. What are the two primary signals used in I2C communication? * (1 Point)

- ◯ SDA and SCL
- ◯ MOSI and MISO
- ◯ TXD and RXD
- ◯ CLK and DATA

40. Which feature distinguishes a microcontroller from a microprocessor? * (1 Point)

- ◯ Clock speed
- ◯ Instruction set architecture
- ◯ On-chip memory and peripherals
- ◯ Compatibility with external devices

41. What is the maximum number of slave devices that can be connected to a single SPI bus? * (1 Point)

- ◯ 4
- ◯ 8
- ◯ 16
- ◯ It depends on the master device

42. How does LoRa technology achieve long-range communication while conserving power? * (1 Point)

- ◯ By using high transmit power
- ◯ By using short-range antennas
- ◯ By using low data rates and spread spectrum modulation
- ◯ By using high-frequency bands for transmission

43. Which SPI mode allows data to be sampled on the leading edge of the clock and changed on the trailing edge? * (1 Point)

- ◯ Mode 0
- ◯ Mode 1
- ◯ Mode 2
- ◯ Mode 3

44. What is the primary function of an actuator? * (1 Point)

- ◯ To sense changes in the environment
- ◯ To process data
- ◯ To convert electrical signals into physical action
- ◯ To transmit data

45. What is the typical range of LoRa communication in urban environments? * (1 Point)

- ◯ Up to 100 meters
- ◯ Up to 1 kilometer
- ◯ Up to 10 kilometers
- ◯ Up to 100 kilometers

46. What does LoRa stand for? * (1 Point)

- ◯ Low Radio
- ◯ Long Range
- ◯ Low Resolution
- ◯ Low Response

47. What is the function of the SS (Slave Select) line in SPI? * (1 Point)

- ◯ Initiates data transfer
- ◯ Indicates the start of a new frame
- ◯ Selects which slave device to communicate with
- ◯ Synchronizes the clocks between master and slave

48. How does a soil moisture sensor typically measure moisture levels in soil? * (1 Point)

- By analyzing electrical conductivity
- By emitting ultrasonic waves
- By detecting changes in pressure
- By measuring light absorption

49. What is the primary application of a soil moisture sensor? * (1 Point)

- Monitoring air quality
- Detecting water leaks
- Measuring the moisture content in soil
- Sensing temperature variations

50. What is the maximum number of devices that can be connected on an I2C bus? * (1 Point)

- 64
- 128
- 256
- Unlimited

51. What is the key advantage of LiFi over traditional WiFi technology? * (1 Point)

- Higher data transfer rates
- Longer range
- Lower cost
- Greater compatibility

52. In I2C communication, which wires are used for data transfer? * (1 Point)

- ◯ SDA (Serial Data) and SCL (Serial Clock)
- ◯ VCC and GND
- ◯ MOSI and MISO
- ◯ TXD and RXD

53. What is the primary function of a sensor? * (1 Point)

- ◯ To process data
- ◯ To transmit data
- ◯ To receive data
- ◯ To detect changes in its environment

54. In SPI communication, which device initiates the data transfer? * (1 Point)

- ◯ Slave
- ◯ Master
- ◯ Both simultaneously
- ◯ None, it's automatic

55. In SPI communication, what is the term for the group of bits transmitted as a single unit? * (1 Point)

- ◯ Byte
- ◯ Frame
- ◯ Packet
- ◯ Block

56. Which programming language is commonly used for embedded systems development? * (1 Point)

- ◯ Ruby
- ◯ Java
- ◯ Python
- ◯ C/C++

57. Which frequency bands are commonly used for LoRa communication? * (1 Point)

- ◯ 2.4 GHz
- ◯ 5 GHz
- ◯ Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz)
- ◯ 3Ghz

58. How many wires are used in I2C communication? * (1 Point)

- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4

59. Which of the following is a disadvantage of I2C communication? * (1 Point)

- ◯ Limited distance between devices
- ◯ High power consumption
- ◯ Complexity in implementation
- ◯ Incompatibility with different devices

60. How does an ultrasonic sensor measure distance? * (1 Point)

- ◯ By emitting and receiving sound waves
- ◯ By emitting and receiving radio waves
- ◯ By emitting and receiving light waves
- ◯ By emitting and receiving magnetic fields

Course Incharges

HOD/ECE

27/4/24

ID	Start time	Completion time	Email	Name	Total points	What is an embedded system?	Points - What is an embedd
1	2-17-24 11:23:58	2-17-24 11:45:20	22uec040@kamarajengg.edu.in	IMMANUVEL.L	38	A system designed to perform specific tasks within a larger system	1
2	2-17-24 11:20:34	2-17-24 11:48:22	22uec057@kamarajengg.edu.in	EBBY ALLANRAJ.A	41	A system designed to perform specific tasks within a larger system	1
3	2-17-24 11:35:00	2-17-24 11:48:48	22uec031@kamarajengg.edu.in	SANKAR.M	31	A system designed to perform specific tasks within a larger system	1
4	2-17-24 11:32:57	2-17-24 11:48:49	22uec047@kamarajengg.edu.in	AMEER AJMAL.M.B	30	A system designed to perform specific tasks within a larger system	1
5	2-17-24 11:22:28	2-17-24 11:50:05	22uec034@kamarajengg.edu.in	DHANUSH.G	34	A system with no microcontroller or microprocessor	0
6	2-17-24 11:24:31	2-17-24 11:51:06	22uec023@kamarajengg.edu.in	DHANUSHDEVA.C	33	A system designed to perform specific tasks within a larger system	1
7	2-17-24 11:20:25	2-17-24 11:51:15	22uec055@kamarajengg.edu.in	ARUN KUMAR.M	35	A system designed to perform specific tasks within a larger system	1
8	2-17-24 11:23:54	2-17-24 11:53:01	22uec049@kamarajengg.edu.in	VIMALRAJ.S	36	A system designed to perform specific tasks within a larger system	1
9	2-17-24 11:23:58	2-17-24 11:55:52	22uec035@kamarajengg.edu.in	DHARUN VAISHNAV.S	30	A system designed to perform specific tasks within a larger system	1
10	2-17-24 11:23:03	2-17-24 11:58:49	22uec013@kamarajengg.edu.in	MOHAMED IMRAN FARITH.S	30	A system designed to perform specific tasks within a larger system	1
11	2-17-24 11:23:35	2-17-24 11:59:21	22uec028@kamarajengg.edu.in	RESHMA.R	31	A system designed to perform specific tasks within a larger system	1
12	2-17-24 11:24:34	2-17-24 12:00:37	22uec029@kamarajengg.edu.in	ARCHANA.P	31	A system designed to perform specific tasks within a larger system	1
13	2-17-24 11:23:28	2-17-24 12:07:46	22uec026@kamarajengg.edu.in	RITHIKA.J	35	A system designed to perform specific tasks within a larger system	1
14	2-17-24 11:19:52	2-17-24 12:09:30	22uec053@kamarajengg.edu.in	ASHIF AHAMED.J	32	A system designed to perform specific tasks within a larger system	1
15	2-17-24 11:20:09	2-17-24 12:09:32	22uec051@kamarajengg.edu.in	PRADEEPKUMAR.S	36	A system designed to perform specific tasks within a larger system	1
16	2-17-24 11:24:19	2-17-24 12:09:44	22uec024@kamarajengg.edu.in	DHARSHINI.V	34	A system designed to perform specific tasks within a larger system	1
17	2-17-24 11:21:25	2-17-24 12:10:10	22uec011@kamarajengg.edu.in	VENKATAHARISH S.C	32	A system designed to perform specific tasks within a larger system	1
18	2-17-24 11:20:32	2-17-24 12:12:29	22uec015@kamarajengg.edu.in	NAVEEN PRASATH.S	43	A system designed to perform specific tasks within a larger system	1

19	2-17-24 11:22:59	2-17-24 12:22:32	22uec052@kamarajengg.edu.in	JENISHA.S	38	A system designed to perform specific tasks within a larger system	1
20	2-17-24 11:25:39	2-17-24 12:23:11	22uec007@kamarajengg.edu.in	VARSHA DEVI.P	35	A computer system with a large memory capacity	0
21	2-17-24 11:24:54	2-17-24 12:23:13	22uec054@kamarajengg.edu.in	SHRUTHIKA.V	38	A system designed to perform specific tasks within a larger system	1
22	2-17-24 11:24:55	2-17-24 12:23:25	22uec045@kamarajengg.edu.in	TEJASWI.R	42	A system designed to perform specific tasks within a larger system	1
23	2-17-24 11:24:46	2-17-24 12:23:26	22uec014@kamarajengg.edu.in	SANTHOSH KUMAR.S	36	A computer system with a large memory capacity	0
24	2-17-24 12:01:18	2-17-24 12:26:11	22uec021@kamarajengg.edu.in	ATCHAYA KARTHIKA.S	38	A system designed to perform specific tasks within a larger system	1
25	2-17-24 11:21:32	2-17-24 12:26:12	22uec063@kamarajengg.edu.in	MEYYALAGAN.M	32	A system designed to perform specific tasks within a larger system	1
26	2-12-24 16:10:31	2-17-24 12:26:13	22uec012@kamarajengg.edu.in	GANESAN.B	30	A system that relies solely on cloud computing	1
27	2-17-24 11:25:29	2-17-24 12:26:21	22uec006@kamarajengg.edu.in	HEMASRI.S	38	A computer system with a large memory capacity	0
28	2-17-24 11:34:18	2-17-24 12:26:44	22uec004@kamarajengg.edu.in	JERLACE SELIN E	39	A system designed to perform specific tasks within a larger system	1
29	2-17-24 12:22:22	2-17-24 12:28:30	22uec022@kamarajengg.edu.in	MARIESWARI.M	31	A system designed to perform specific tasks within a larger system	1
30	2-17-24 11:26:33	2-17-24 12:31:08	22uec039@kamarajengg.edu.in	DHESIKA.K.M.S	39	A system that relies solely on cloud computing	0
31	2-17-24 11:27:31	2-17-24 12:32:31	22uec041@kamarajengg.edu.in	VIVEKA.S	40	A system designed to perform specific tasks within a larger system	1
32	2-17-24 12:24:48	2-17-24 12:33:21	22uec027@kamarajengg.edu.in	KISHORKUMAR.R	51	A system designed to perform specific tasks within a larger system	1

Which programming language is	Points- Which program	What does I2C stand for?	Points - What does I2C	How many wires are	Points - How many	Which of the following devices is NOT	Points - Which of the	What is the maximum number of	Points - What is the	In I2C communication, which	Points - In I2C communication, which
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Both master and slave	0
C/C++	1	Inter-Integrated Circuit	1	4	0	Controller	1	128	1	Both master and slave	0
C/C++	1	Integrated 2 Circuits	1	2	0	Controller	1	128	1	Both master and slave	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Slave	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	2	1	Controller	1	64	0	Both master and slave	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Both master and slave	0
C/C++	1	Integrated 2 Circuits	0	4	0	Controller	1	128	1	Slave	0
C/C++	1	Integrated 2 Circuits	0	4	0	Controller	1	64	0	Master	1
C/C++	1	Inter-Integrated Circuit	1	2	1	Controller	1	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Slave	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Master	0	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	3	0	Peripheral	0	128	1	Slave	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Controller	1	128	1	Both master and slave	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Slave	0	Unlimited	0	Master	1
Ruby	0	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Peripheral	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Controller	1	128	1	Master	1

C/C++	1	Inter-Integrated Circuit	1	4	0	Peripheral	0	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	4	0	Peripheral	0	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Both master and slave	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Both master and slave	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Controller	1	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	2	1	Master	0	128	1	Peripheral	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Slave	0	128	1	Peripheral	0
C/C++	1	Inter-Integrated Circuit	1	4	0	Master	0	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	2	1	Slave	0	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	4	0	Peripheral	0	128	1	Both master and slave	0
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Master	1
C/C++	1	Inter-Integrated Circuit	1	2	1	Peripheral	0	128	1	Master	1
Ruby	0	Inter-Integrated Circuit	1	2	1	Controller	1	128	1	Peripheral	0

Which of the following is a disadvantage of I2C	Points - Which of the	What is the maximum data rate	Points - What is the	What does SPI stand for?	Points - What does SPI stand	What is the primary advantage of	Points - What is the primary	In SPI communication, what is the role of the Chip Select (CS) signal?	Points - In SPI communic
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	Low power consumption	1	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	High-frequency bands usage	0	It selects the specific slave device with which the master wants to	1
Complexity in implementation	0	1 Mbps	0	Serial Protocol Interface	0	Short range communication	0	It indicates the start and end of data transmission	0
Incompatibility with different devices	1	100 kbps	0	Serial Peripheral Interface	1	High-frequency bands usage	0	It selects the specific slave device with which the master wants to	1
Limited distance between devices	0	100 kbps	0	Serial Peripheral Interface	1	Low power consumption	1	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	100 kbps	0	Serial Peripheral Interface	1	High-frequency bands usage	0	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	Low power consumption	1	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	Low power consumption	1	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	Low power consumption	1	It selects the specific slave device with which the master wants to	1
High power consumption	0	400 kbps	1	Serial Peripheral Interface	1	Low power consumption	1	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	1 Mbps	0	Serial Peripheral Interface	1	Low power consumption	1	It indicates the start and end of data transmission	0
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	Short range communication	0	It generates the clock signal for synchronization	0
Limited distance between devices	1	1 Mbps	0	Serial Peripheral Interface	1	Low power consumption	1	It indicates the start and end of data transmission	0
Incompatibility with different devices	0	400 kbps	1	Serial Peripheral Interface	1	High data rate	0	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	Low power consumption	1	It controls the direction of data flow on the bus	0
Incompatibility with different devices	0	1 Mbps	0	Serial Peripheral Interface	1	Low power consumption	1	It generates the clock signal for synchronization	0
Incompatibility with different devices	0	100 kbps	0	Serial Peripheral Interface	1	Low power consumption	1	It selects the specific slave device with which the master wants to	1
Incompatibility with different devices	0	1 Mbps	0	Serial Peripheral Interface	1	High-frequency bands usage	0	It indicates the start and end of data transmission	0

Limited distance between devices	1	100 kbps	0	Serial Peripheral Interface	1	High-frequency bands usage	0	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	High data rate	0	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	High data rate	0	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	High-frequency bands usage	0	It selects the specific slave device with which the master wants to	1
Complexity in implementation	0	400 kbps	1	Serial Peripheral Interface	1	Low power consumption	1	It indicates the start and end of data transmission	0
Limited distance between devices	1	100 kbps	0	Serial Peripheral Interface	1	High-frequency bands usage	0	It selects the specific slave device with which the master wants to	1
High power consumption	0	100 kbps	0	Serial Peripheral Interface	1	Short range communication	0	It indicates the start and end of data transmission	0
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	High data rate	0	It indicates the start and end of data transmission	0
Incompatibility with different devices	0	100 kbps	0	Serial Peripheral Interface	1	Low power consumption	1	It indicates the start and end of data transmission	0
Limited distance between devices	1	100 kbps	0	Serial Peripheral Interface	1	High data rate	0	It selects the specific slave device with which the master wants to	1
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	Low power consumption	1	It generates the clock signal for synchronization	0
Limited distance between devices	1	100 kbps	0	Serial Peripheral Interface	1	High data rate	0	It generates the clock signal for synchronization	0
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	High data rate	0	It indicates the start and end of data transmission	0
Limited distance between devices	1	400 kbps	1	Serial Peripheral Interface	1	Low power consumption	1	It selects the specific slave device with which the master wants to	1

What does LoRa stand for?	Points - What does LoRa stand for?	How many wires are used in SPI communication	Points - How many wires are	Which device initiates the data transfer	Points - Which device initiates	Which frequency bands are commonly used for LoRa communication?	Points - Which frequency bands are	What is the typical range of LoRa communicatio	Points - What is the typical range of
Long Range	1	4	0	Master	1	Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz)	1	Up to 100 kilometers	0
Long Range	1	4	0	Master	1	2.4 GHz	0	Up to 1 kilometer	0
Long Range	1	4	0	Controller	0	5 GHz	0	Up to 100 meters	0
Long Range	1	2	1	Master	1	5 GHz	0	Up to 100 kilometers	0
Long Range	1	3	0	Master	1	2.4 GHz	0	Up to 1 kilometer	0
Long Range	1	3	0	Master	1	Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz)	1	Up to 10 kilometers	1
Long Range	1	4	0	Master	1	Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz)	1	Up to 100 meters	0
Long Range	1	4	0	Master	1	2.4 GHz	0	Up to 10 kilometers	1
Long Range	1	1	0	Slave	0	3Ghz	0	Up to 10 kilometers	1
Long Range	1	2	1	Slave	0	5 GHz	0	Up to 10 kilometers	1
Long Range	1	4	0	Slave	0	Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz)	1	Up to 100 kilometers	0
Long Range	1	4	0	Controller	0	Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz)	1	Up to 1 kilometer	0
Long Range	1	2	1	Master	1	Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz)	1	Up to 10 kilometers	1
Long Range	1	2	1	Master	1	2.4 GHz	0	Up to 10 kilometers	1
Long Range	1	4	0	Master	1	5 GHz	0	Up to 1 kilometer	0
Long Range	1	2	1	Master	1	Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz)	1	Up to 10 kilometers	1
Long Range	1	2	1	Controller	0	Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz)	1	Up to 10 kilometers	1
Long Range	1	4	0	Master	1	Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz)	1	Up to 10 kilometers	1

How does LoRa technology achieve long-range communication while	Points - How does LoRa	What is the typical operating	Points - What is the typical	Which memory type is non-volatile and	Points - Which memory	In I2C communication, which wires are used for data transfer?	Points - In I2C communicati
By using low data rates and spread spectrum modulation	1	5V - 12V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using short-range antennas	0	3.3V - 5V	0	SRAM	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using high-frequency bands for transmission	0	5V - 12V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using high-frequency bands for transmission	0	5V - 12V	0	Flash memory	0	VCC and GND	0
By using low data rates and spread spectrum modulation	1	3.3V - 5V	0	SRAM	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using high-frequency bands for transmission	0	3.3V - 5V	0	SRAM	0	TXD and RXD	0
By using short-range antennas	0	3.3V - 5V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using low data rates and spread spectrum modulation	1	3.3V - 5V	0	SRAM	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using short-range antennas	0	3.3V - 5V	0	EEPROM	1	SDA (Serial Data) and SCL (Serial Clock)	1
By using high-frequency bands for transmission	0	3.3V - 5V	0	EEPROM	1	TXD and RXD	0
By using short-range antennas	0	5V - 12V	0	EEPROM	1	SDA (Serial Data) and SCL (Serial Clock)	1
By using low data rates and spread spectrum modulation	1	5V - 12V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using short-range antennas	0	5V - 12V	0	EEPROM	1	SDA (Serial Data) and SCL (Serial Clock)	1
By using high transmit power	0	3.3V - 5V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using high transmit power	0	3.3V - 5V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using high transmit power	0	3.3V - 5V	0	SRAM	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using low data rates and spread spectrum modulation	1	3.3V - 5V	0	Flash memory	0	VCC and GND	0
By using low data rates and spread spectrum modulation	1	3.3V - 5V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1

By using high transmit power	0	3.3V - 5V	0	EEPROM	1	SDA (Serial Data) and SCL (Serial Clock)	1
By using high-frequency bands for transmission	0	3.3V - 5V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using high-frequency bands for transmission	0	3.3V - 5V	0	EEPROM	1	SDA (Serial Data) and SCL (Serial Clock)	1
By using high-frequency bands for transmission	0	3.3V - 5V	0	EEPROM	1	SDA (Serial Data) and SCL (Serial Clock)	1
By using high-frequency bands for transmission	0	3.3V - 5V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using low data rates and spread spectrum modulation	1	3.3V - 5V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using high transmit power	0	3.3V - 5V	0	EEPROM	1	VCC and GND	0
By using short-range antennas	0	3.3V - 5V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using high transmit power	0	3.3V - 5V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using low data rates and spread spectrum modulation	1	5V - 12V	0	DRAM	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using low data rates and spread spectrum modulation	1	3.3V - 5V	0	Flash memory	0	TXD and RXD	0
By using low data rates and spread spectrum modulation	1	5V - 12V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using high transmit power	0	5V - 12V	0	Flash memory	0	SDA (Serial Data) and SCL (Serial Clock)	1
By using low data rates and spread spectrum modulation	1	1.8V - 3.3V	1	EEPROM	1	SDA (Serial Data) and SCL (Serial Clock)	1

Which of the following is true about the "acknowledge" signal in I2C communication?	Points - Which of the following is	What is the typical data frame size in	Points - What is the typical	What is the purpose of the "stop" condition in I2C communication?	Points - What is the purpose of	Which wire in SPI is responsible	Points - Which wire in	In SPI communication, which device initiates the data transfer?
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MOSI	1	Both simultaneously
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MOSI	1	Both simultaneously
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	SS	0	Master
It indicates that the data was received successfully by the receiver.	0	64 bits	0	Indicates the end of data transfer	1	MISO	0	Both simultaneously
It is sent by the slave after receiving data from the master.	1	8 bits	1	Resets the communication bus	0	MISO	0	Master
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MISO	0	Slave
It is sent by the master after receiving data from the slave.	0	32 bits	0	Resets the communication bus	0	MISO	0	Both simultaneously
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MOSI	1	Both simultaneously
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	SCK	0	Both simultaneously
It indicates that the data was corrupted during transmission.	0	32 bits	0	Indicates the end of data transfer	1	SS	0	Both simultaneously
It is sent by the master after receiving data from the slave.	0	16 bits	0	Indicates the end of data transfer	1	MOSI	1	Both simultaneously
It indicates that the data was corrupted during transmission.	0	8 bits	1	Indicates the end of data transfer	1	SCK	0	Master
It is sent by the master after receiving data from the slave.	0	16 bits	0	Indicates the end of data transfer	1	SS	0	Both simultaneously
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MOSI	1	Slave
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MOSI	1	Both simultaneously
It indicates that the data was received successfully by the receiver.	0	16 bits	0	Indicates the end of data transfer	1	MOSI	1	Master
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MISO	0	Master
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	SCK	0	Master

It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MOSI	1	Both simultaneously
It is sent by the master after receiving data from the slave.	0	8 bits	1	Forces a restart of the communication	0	MISO	0	Master
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MOSI	1	Both simultaneously
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MOSI	1	Master
It indicates that the data was received successfully by the receiver.	0	16 bits	0	Marks an error condition on the bus	0	MISO	0	Master
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Resets the communication bus	0	MOSI	1	Master
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	MOSI	1	None, it's automatic
It indicates that the data was corrupted during transmission.	0	16 bits	0	Indicates the end of data transfer	1	MISO	0	Master
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Resets the communication bus	0	MISO	0	Master
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Indicates the end of data transfer	1	SCK	0	Master
It is sent by the master after receiving data from the slave.	0	8 bits	1	Forces a restart of the communication	0	MISO	0	Master
It indicates that the data was received successfully by the receiver.	0	8 bits	1	Marks an error condition on the bus	0	SS	0	Master
It indicates that the data was corrupted during transmission.	0	8 bits	1	Marks an error condition on the bus	0	MOSI	1	Master
It is sent by the master after receiving data from the slave.	0	8 bits	1	Indicates the end of data transfer	1	MOSI	1	Master

Points - In SPI communicat	What is the function of the SS (Slave Select) line in SPI?	Points - What is the function of	Which SPI mode allows data to be	Points - Which SPI mode	In SPI communi cation,	Points - In SPI communic	What is the maximum number of slave devices	Points - What is the maximum	What does IoT stand for?	Points - What does IoT
0	Selects which slave device to communicate with	1	Mode 1	0	Byte	0	It depends on the master device	1	Internet of Things	1
0	Selects which slave device to communicate with	1	Mode 3	1	Byte	0	It depends on the master device	1	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 1	0	Block	0	8	0	Internet of Things	1
0	Selects which slave device to communicate with	1	Mode 2	0	Byte	0	16	0	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 1	0	Byte	0	16	0	Internet of Things	1
0	Selects which slave device to communicate with	1	Mode 0	0	Byte	0	4	0	Intranet of Things	0
0	Synchronizes the clocks between master and slave	0	Mode 0	0	Frame	1	16	0	Internet of Things	1
0	Selects which slave device to communicate with	1	Mode 0	0	Frame	1	It depends on the master device	1	Internet of Things	1
0	Initiates data transfer	0	Mode 1	0	Byte	0	It depends on the master device	1	Internet of Things	1
0	Selects which slave device to communicate with	1	Mode 0	0	Byte	0	It depends on the master device	1	Internet of Things	1
0	Selects which slave device to communicate with	1	Mode 1	0	Packet	0	It depends on the master device	1	Internet of Things	1
1	Indicates the start of a new frame	0	Mode 1	0	Byte	0	It depends on the master device	1	Internet of Things	1
0	Selects which slave device to communicate with	1	Mode 1	0	Packet	0	It depends on the master device	1	Internet of Things	1
0	Selects which slave device to communicate with	1	Mode 0	0	Byte	0	4	0	Internet of Things	1
0	Selects which slave device to communicate with	1	Mode 1	0	Frame	1	It depends on the master device	1	Internet of Things	1
1	Synchronizes the clocks between master and slave	0	Mode 1	0	Packet	0	16	0	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 0	0	Byte	0	4	0	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 0	0	Byte	0	It depends on the master device	1	Internet of Things	1

0	Selects which slave device to communicate with	1	Mode 2	0	Packet	0	It depends on the master device	1	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 1	0	Byte	0	It depends on the master device	1	Internet of Things	1
0	Selects which slave device to communicate with	1	Mode 0	0	Packet	0	It depends on the master device	1	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 2	0	Packet	0	It depends on the master device	1	Internet of Things	1
1	Indicates the start of a new frame	0	Mode 0	0	Byte	0	4	0	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 0	0	Byte	0	It depends on the master device	1	Internet of Things	1
0	Initiates data transfer	0	Mode 0	0	Byte	0	4	0	Internet of Things	1
1	Indicates the start of a new frame	0	Mode 1	0	Frame	1	4	0	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 0	0	Byte	0	It depends on the master device	1	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 0	0	Byte	0	It depends on the master device	1	Internet of Things	1
1	Synchronizes the clocks between master and slave	0	Mode 0	0	Byte	0	8	0	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 3	1	Frame	1	It depends on the master device	1	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 0	0	Frame	1	It depends on the master device	1	Internet of Things	1
1	Selects which slave device to communicate with	1	Mode 3	1	Frame	1	4	0	Internet of Things	1

Which wireless communica	Points - Which wireless	What is the purpose of MQTT (Message Queuing	Points - What is the purpose of	Which of the following	Points - Which of the	Which of the following is NOT a	Points - Which of the following is	What type of network topology is	Points - What type of network	Which IoT application area focuses on	Points - Which IoT application
LoRa	0	Efficient message communication	1	Web browser	1	Accelerometer	0	Bus	0	Smart cities	0
LoRa	0	Real-time data streaming	0	Web browser	1	Accelerometer	0	Bus	0	Industrial automation	0
Zigbee	1	Secure device authentication	0	Actuator	0	Accelerometer	0	Bus	0	Smart cities	0
Zigbee	1	Efficient message communication	1	Actuator	0	Accelerometer	0	Bus	0	Smart grid	1
LoRa	0	Real-time data streaming	0	Microcontroller	0	Barcode scanner	1	Mesh	0	Smart cities	0
LoRa	0	Real-time data streaming	0	Web browser	1	Accelerometer	0	Bus	0	Industrial automation	0
Zigbee	1	Secure device authentication	0	Web browser	1	Accelerometer	0	Star	1	Smart cities	0
LoRa	0	Real-time data streaming	0	Actuator	0	Accelerometer	0	Bus	0	Smart cities	0
LoRa	0	Secure device authentication	0	Sensor	0	Barcode scanner	1	Bus	0	Smart cities	0
LTE	0	Efficient message communication	1	Web browser	1	Accelerometer	0	Bus	0	Smart cities	0
LoRa	0	Efficient message communication	1	Microcontroller	0	Accelerometer	0	Bus	0	Industrial automation	0
Zigbee	1	Real-time data streaming	0	Web browser	1	Accelerometer	0	Bus	0	Industrial automation	0
Zigbee	1	Efficient message communication	1	Microcontroller	0	Accelerometer	0	Bus	0	Industrial automation	0
LTE	0	Real-time data streaming	0	Actuator	0	Light sensor	0	Mesh	0	Smart cities	0
LTE	0	Real-time data streaming	0	Actuator	0	Accelerometer	0	Mesh	0	Smart cities	0
Zigbee	1	Efficient message communication	1	Web browser	1	Accelerometer	0	Bus	0	Smart cities	0
LTE	0	Real-time data streaming	0	Actuator	0	Barcode scanner	1	Bus	0	Smart cities	0
Zigbee	1	Efficient message communication	1	Web browser	1	Barcode scanner	1	Mesh	0	Smart cities	0

Zigbee	1	Real-time data streaming	0	Actuator	0	Barcode scanner	1	Bus	0	Smart cities	0
Zigbee	1	Efficient message communication	1	Web browser	1	Barcode scanner	1	Bus	0	Smart cities	0
Zigbee	1	Real-time data streaming	0	Actuator	0	Accelerometer	0	Bus	0	Smart cities	0
Zigbee	1	Real-time data streaming	0	Actuator	0	Barcode scanner	1	Bus	0	Smart cities	0
LTE	0	Efficient message communication	1	Web browser	1	Accelerometer	0	Mesh	0	Smart grid	1
Zigbee	1	Efficient message communication	1	Web browser	1	Barcode scanner	1	Bus	0	Smart cities	0
LTE	0	Real-time data streaming	0	Web browser	1	Accelerometer	0	Bus	0	Smart cities	0
LTE	0	Real-time data streaming	0	Web browser	1	Accelerometer	0	Bus	0	Smart grid	1
Zigbee	1	Efficient message communication	1	Web browser	1	Light sensor	0	Bus	0	Smart grid	1
Zigbee	1	Efficient message communication	1	Web browser	1	Temperature sensor	0	Bus	0	Smart grid	1
Zigbee	1	Efficient message communication	1	Web browser	1	Barcode scanner	1	Bus	0	Smart cities	0
Zigbee	1	Device discovery	0	Actuator	0	Barcode scanner	1	Mesh	0	Smart cities	0
Zigbee	1	Efficient message communication	1	Microcontroller	0	Accelerometer	0	Star	1	Smart cities	0
LTE	0	Efficient message communication	1	Actuator	0	Barcode scanner	1	Star	1	Smart grid	1

Who is often credited with coining the term "Internet of [illegible]"	Points - Who is often credited [illegible]	Who developed the I2C protocol?	Points - Who developed the I2C [illegible]	What was the original purpose behind the development of the I2C [illegible]	Points - What was the original [illegible]	In I2C communication, what is the role of the SDA (Serial [illegible]	Points - In I2C communic [illegible]	What are the two primary signals used in I2C [illegible]	Points - What are the two primary [illegible]
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Communication between chips on a TV	1	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Communication between chips on a TV	1	It carries the data signal.	1	SDA and SCL	1
Tim Berners-Lee	0	Philips Semiconductors (now NXP Semiconductors)	1	Interfacing microcontrollers with displays	0	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Intel Corporation	0	Networking home appliances	0	It carries the data signal.	1	MOSI and MISO	0
Kevin Ashton	1	Intel Corporation	0	Interfacing microcontrollers with displays	0	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Intel Corporation	0	Interfacing microcontrollers with displays	0	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP Semiconductors)	1	Communication between chips on a TV set	1	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Intel Corporation	0	Linking computers with peripherals	0	It carries the data signal.	1	CLK and DATA	0
Kevin Ashton	1	Philips Semiconductors (now NXP Semiconductors)	1	Linking computers with peripherals	0	It carries the data signal.	1	SDA and SCL	1
Tim Berners-Lee	0	Texas Instruments	0	Networking home appliances	0	It carries the data signal.	1	CLK and DATA	0
Kevin Ashton	1	Intel Corporation	0	Linking computers with peripherals	0	It synchronizes the clocks between master and slave	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP Semiconductors)	1	Networking home appliances	0	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Intel Corporation	0	Communication between chips on a TV set	1	It carries the clock signal.	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Networking home appliances	0	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP Semiconductors)	1	Interfacing microcontrollers with displays	0	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Intel Corporation	0	Linking computers with peripherals	0	It carries the clock signal.	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Linking computers with peripherals	0	It synchronizes the clocks between master and slave	0	MOSI and MISO	0
Kevin Ashton	1	Philips Semiconductors (now NXP Semiconductors)	1	Linking computers with peripherals	0	It carries the data signal.	1	MOSI and MISO	0

Kevin Ashton	1	Philips Semiconductors (now NXP	1	Interfacing microcontrollers with	0	It synchronizes the clocks between	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Interfacing microcontrollers with	0	It carries the clock signal.	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Communication between chips on a TV	1	It synchronizes the clocks between	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Communication between chips on a TV	1	It synchronizes the clocks between	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Linking computers with peripherals	0	It carries the data signal.	1	MOSI and MISO	0
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Interfacing microcontrollers with	0	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Linking computers with peripherals	0	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Robert Bosch GmbH	0	Communication between chips on a TV	1	It carries the data signal.	1	MOSI and MISO	0
Kevin Ashton	1	Robert Bosch GmbH	0	Communication between chips on a TV	1	It synchronizes the clocks between	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Communication between chips on a TV	1	It carries the clock signal.	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Interfacing microcontrollers with	0	It carries the clock signal.	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Communication between chips on a TV	1	It synchronizes the clocks between	0	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Communication between chips on a TV	1	It carries the data signal.	1	SDA and SCL	1
Kevin Ashton	1	Philips Semiconductors (now NXP	1	Communication between chips on a TV	1	It carries the data signal.	1	MOSI and MISO	0

What does "CAN" stand for?	Points - What does "CAN"	What is the typical operating	Points - What is the typical	What is LiFi technology primarily used	Points - What is LiFi	How does LiFi transmit data?	Points - How does LiFi	What is the key advantage of LiFi over traditional	Points - What is the key	Who developed the CAN
Controller Area Network	1	433 MHz	0	High-speed data communication	1	Through visible light	1	Longer range	0	Intel Corporation
Controller Area Network	1	2.4 GHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Central Area Network	0	915 MHz	1	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Central Area Network	0	915 MHz	1	High-speed data communication	1	Through visible light	1	Longer range	0	Intel Corporation
Controller Area Network	1	433 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Controller Area Network	1	433 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Controller Area Network	1	433 MHz	0	Satellite communication	0	Through visible light	1	Longer range	0	Bosch
Controller Area Network	1	433 MHz	0	High-speed data communication	1	Through visible light	1	Longer range	0	Bosch
Controller Area Network	1	2.4 GHz	0	High-speed data communication	1	Through visible light	1	Longer range	0	Bosch
Central Area Network	0	868 MHz	0	High-speed data communication	1	Through microwaves	0	Higher data transfer rates	1	Bosch
Central Area Network	0	433 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	IBM
Controller Area Network	1	433 MHz	0	High-speed data communication	1	Through visible light	1	Longer range	0	IBM
Central Area Network	0	433 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Controller Area Network	1	2.4 GHz	0	High-speed data communication	1	Through visible light	1	Longer range	0	Bosch
Controller Area Network	1	2.4 GHz	0	High-speed data communication	1	Through microwaves	0	Higher data transfer rates	1	Bosch
Central Area Network	0	433 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Controller Area Network	1	2.4 GHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Controller Area Network	1	868 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch

Controller Area Network	1	433 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Controller Area Network	1	868 MHz	0	High-speed data communication	1	Through infrared signals	0	Higher data transfer rates	1	Bosch
Controller Area Network	1	433 MHz	0	Wireless charging	0	Through visible light	1	Longer range	0	Bosch
Controller Area Network	1	433 MHz	0	High-speed data communication	1	Through visible light	1	Longer range	0	Bosch
Controller Area Network	1	868 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Controller Area Network	1	868 MHz	0	Wireless charging	0	Through infrared signals	0	Higher data transfer rates	1	Bosch
Controller Area Network	1	433 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Controller Area Network	1	868 MHz	0	GPS tracking	0	Through radio waves	0	Higher data transfer rates	1	Bosch
Controller Area Network	1	433 MHz	0	High-speed data communication	1	Through infrared signals	0	Longer range	0	Bosch
Controller Area Network	1	868 MHz	0	High-speed data communication	1	Through infrared signals	0	Lower cost	0	Intel Corporation
Controller Area Network	1	868 MHz	0	Wireless charging	0	Through infrared signals	0	Lower cost	0	Bosch
Controller Area Network	1	868 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Controller Area Network	1	433 MHz	0	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch
Controller Area Network	1	915 MHz	1	High-speed data communication	1	Through visible light	1	Higher data transfer rates	1	Bosch

Points - Who developed the CAN	What is the primary application area of the CAN protocol?	Points - What is the primary application	Which feature distinguishes a microcontroller from a
0	Industrial automation and automotive systems	1	Compatibility with external devices
1	Industrial automation and automotive systems	1	Compatibility with external devices
1	Industrial automation and automotive systems	1	On-chip memory and peripherals
0	Home automation	0	Instruction set architecture
1	Home automation	0	Clock speed
1	Wireless communication	0	Instruction set architecture
1	Home automation	0	Compatibility with external devices
1	Wireless communication	0	Instruction set architecture
1	Industrial automation and automotive systems	1	Compatibility with external devices
1	Home automation	0	Compatibility with external devices
0	Wireless communication	0	Instruction set architecture
0	Wireless communication	0	Clock speed
1	Wireless communication	0	Compatibility with external devices
1	Industrial automation and automotive systems	1	On-chip memory and peripherals
1	Industrial automation and automotive systems	1	Clock speed
1	Wireless communication	0	Compatibility with external devices
1	Home automation	0	Clock speed
1	Industrial automation and automotive systems	1	On-chip memory and peripherals

1	Industrial automation and automotive systems	1	On-chip memory and peripherals
1	Home automation	0	On-chip memory and peripherals
1	Home automation	0	On-chip memory and peripherals
1	Industrial automation and automotive systems	1	On-chip memory and peripherals
1	Industrial automation and automotive systems	1	Compatibility with external devices
1	Industrial automation and automotive systems	1	On-chip memory and peripherals
1	Home automation	0	On-chip memory and peripherals
1	Industrial automation and automotive systems	1	Instruction set architecture
1	Industrial automation and automotive systems	1	Compatibility with external devices
0	Industrial automation and automotive systems	1	On-chip memory and peripherals
1	Home automation	0	On-chip memory and peripherals
1	Industrial automation and automotive systems	1	On-chip memory and peripherals
1	Satellite communication	0	On-chip memory and peripherals
1	Industrial automation and automotive systems	1	On-chip memory and peripherals

Points - Which feature	What is the primary function of a microprocessor?	Points - What is the	Which of the following components is	Points - Which of the	What is the primary function of a sensor?	Points - What is the	Which of the following is NOT a type of sensor?	Points - Which of the	What is the primary function of an actuator?
0	Control of external devices	0	Arithmetic logic unit (ALU)	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Execution of specific tasks or programs	1	Random access memory (RAM)	1	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
1	Execution of specific tasks or programs	1	Random access memory (RAM)	1	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Real-time data processing	0	Arithmetic logic unit (ALU)	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Execution of specific tasks or programs	1	Random access memory (RAM)	1	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Control of external devices	0	Arithmetic logic unit (ALU)	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Execution of specific tasks or programs	1	Input/output interfaces	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Control of external devices	0	Arithmetic logic unit (ALU)	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Real-time data processing	0	Input/output interfaces	0	To detect changes in its environment	1	Pressure sensor	0	To transmit data
0	Execution of specific tasks or programs	1	Arithmetic logic unit (ALU)	0	To detect changes in its environment	1	Actuator sensor	1	To process data
0	Control of external devices	0	Control unit (CU)	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Real-time data processing	0	Input/output interfaces	0	To detect changes in its environment	1	Pressure sensor	0	To convert electrical signals into physical action
0	Control of external devices	0	Control unit (CU)	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
1	Real-time data processing	0	Input/output interfaces	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Execution of specific tasks or programs	1	Random access memory (RAM)	1	To detect changes in its environment	1	Pressure sensor	0	To transmit data
0	Real-time data processing	0	Random access memory (RAM)	1	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Execution of specific tasks or programs	1	Control unit (CU)	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
1	Execution of specific tasks or programs	1	Random access memory (RAM)	1	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action

1	Control of external devices	0	Control unit (CU)	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
1	Real-time data processing	0	Input/output interfaces	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
1	Execution of specific tasks or programs	1	Random access memory (RAM)	1	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
1	Execution of specific tasks or programs	1	Random access memory (RAM)	1	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Execution of specific tasks or programs	1	Arithmetic logic unit (ALU)	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
1	Control of external devices	0	Arithmetic logic unit (ALU)	0	To process data	0	Actuator sensor	1	To convert electrical signals into physical action
1	Real-time data processing	0	Control unit (CU)	0	To process data	0	Actuator sensor	1	To convert electrical signals into physical action
0	Real-time data processing	0	Arithmetic logic unit (ALU)	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
0	Execution of specific tasks or programs	1	Random access memory (RAM)	1	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
1	Real-time data processing	0	Random access memory (RAM)	1	To transmit data	0	Temperature sensor	0	To convert electrical signals into physical action
1	Real-time data processing	0	Input/output interfaces	0	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
1	Real-time data processing	0	Random access memory (RAM)	1	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action
1	Control of external devices	0	Input/output interfaces	0	To detect changes in its environment	1	Pressure sensor	0	To convert electrical signals into physical action
1	Execution of specific tasks or programs	1	Random access memory (RAM)	1	To detect changes in its environment	1	Actuator sensor	1	To convert electrical signals into physical action

Points - What is the	What is the primary application of a soil moisture sensor?	Points - What is the	How does a soil moisture sensor typically measure	Points - How does a soil	What is the main purpose of a water sensor?	Points - What is the main	Which of the following types of water	Points - Which of the	How does an ultrasonic sensor measure distance?	Points - How does an
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To measure water temperature	0	Capacitive water sensor	0	By emitting and receiving light waves	0
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By emitting ultrasonic waves	0	To detect the presence of water or moisture	1	Capacitive water sensor	0	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To monitor water pressure	0	Conductive water sensor	1	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving magnetic fields	0
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving sound waves	1
0	Measuring the moisture content in soil	1	By measuring light absorption	0	To detect the presence of water or moisture	1	Capacitive water sensor	0	By emitting and receiving magnetic fields	0
0	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By detecting changes in pressure	0	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving radio waves	0
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Ultrasonic water sensor	0	By emitting and receiving radio waves	0
1	Measuring the moisture content in soil	1	By detecting changes in pressure	0	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving radio waves	0
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To monitor water pressure	0	Capacitive water sensor	0	By emitting and receiving light waves	0
0	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Capacitive water sensor	0	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving radio waves	0
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To measure water temperature	0	Capacitive water sensor	0	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Ultrasonic water sensor	0	By emitting and receiving sound waves	1

1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Ultrasonic water sensor	0	By emitting and receiving radio waves	0
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Capacitive water sensor	0	By emitting and receiving light waves	0
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Ultrasonic water sensor	0	By emitting and receiving radio waves	0
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Ultrasonic water sensor	0	By emitting and receiving radio waves	0
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Capacitive water sensor	0	By emitting and receiving sound waves	1
1	Detecting water leaks	0	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Ultrasonic water sensor	0	By emitting and receiving sound waves	1
1	Monitoring air quality	0	By analyzing electrical conductivity	1	To measure water temperature	0	Conductive water sensor	1	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To analyze water quality	0	Conductive water sensor	1	By emitting and receiving radio waves	0
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Ultrasonic water sensor	0	By emitting and receiving sound waves	1
1	Monitoring air quality	0	By detecting changes in pressure	0	To detect the presence of water or moisture	1	Ultrasonic water sensor	0	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To detect the presence of water or moisture	1	Ultrasonic water sensor	0	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By emitting ultrasonic waves	0	To detect the presence of water or moisture	1	Conductive water sensor	1	By emitting and receiving sound waves	1
1	Measuring the moisture content in soil	1	By analyzing electrical conductivity	1	To measure water temperature	0	Conductive water sensor	1	By emitting and receiving sound waves	1

Course Incharges

HOD/ECE

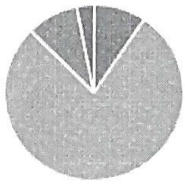
22/4/24

MCQ-Assessment-Value Added Course on "Embedded IoT with Node MCU and Raspberry PICO"

32 Responses | 35.0 Average Score | Active Status

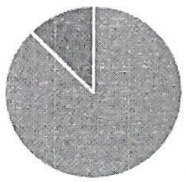
1. What is an embedded system? (1 point)
78% of respondents (25 of 32) answered this question correctly.

A computer system with a large ...	3
A system designed to perform s...	25 ✓
A system that relies solely on cl...	3
A system with no microcontrolle...	1



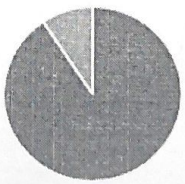
2. Which programming language is commonly used for embedded systems development? (1 point)
88% of respondents (28 of 32) answered this question correctly.

Java	0
Python	0
C/C++	28 ✓
Ruby	4



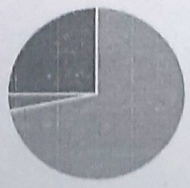
3. What does I2C stand for? (1 point)
91% of respondents (29 of 32) answered this question correctly.

Inter-Integrated Circuit	29 ✓
Integrated 2 Circuits	3
Interface-to-Computer	0
Input/Output to Chip	0



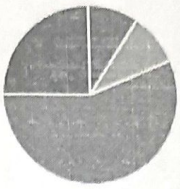
4. How many wires are used in I2C communication? (1 point)
72% of respondents (23 of 32) answered this question correctly.

1	0
2	23 ✓
3	1
4	8



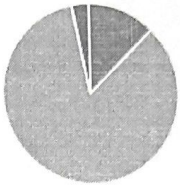
5. Which of the following devices is NOT commonly found in an I2C network? (1 point)
25% of respondents (8 of 32) answered this question correctly.

Master	3
Slave	3
Peripheral	18
Controller	8 ✓



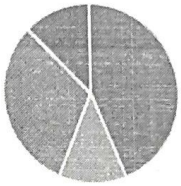
6. What is the maximum number of devices that can be connected on an I2C bus? (1 point)
84% of respondents (27 of 32) answered this question correctly.

64	4
128	27 ✓
256	0
Unlimited	1



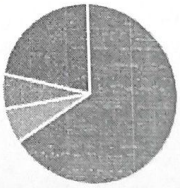
7. In I2C communication, which device generates the clock signal? (1 point)
44% of respondents (14 of 32) answered this question correctly.

Master	14 ✓
Slave	4
Both master and slave	10
Peripheral	4



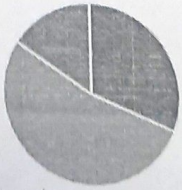
8. Which of the following is a disadvantage of I2C communication? (1 point)
66% of respondents (21 of 32) answered this question correctly.

Limited distance between devices	21 ✓
High power consumption	2
Complexity in implementation	2
Incompatibility with different de...	7



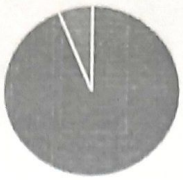
9. What is the maximum data rate supported by standard I2C communication? (1 point)
53% of respondents (17 of 32) answered this question correctly.

100 kbps	10
400 kbps	17 ✓
1 Mbps	5
10 Mbps	0



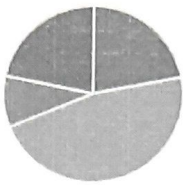
10. What does SPI stand for? (1 point)
94% of respondents (30 of 32) answered this question correctly.

Serial Peripheral Interface	30	✓
Simple Peripheral Interface	0	
Serial Protocol Interface	2	
Single Pin Interface	0	



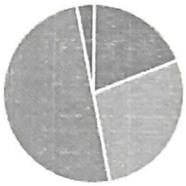
11. What is the primary advantage of LoRa (Long Range) technology in wireless communication? (1 point)
47% of respondents (15 of 32) answered this question correctly.

High data rate	7	
Low power consumption	15	✓
Short range communication	3	
High-frequency bands usage	7	



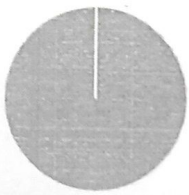
12. In SPI communication, what is the role of the Chip Select (CS) signal? (1 point)
50% of respondents (16 of 32) answered this question correctly.

It generates the clock signal for ...	6	
It indicates the start and end of ...	9	
It selects the specific slave devic...	16	✓
It controls the direction of data ...	1	



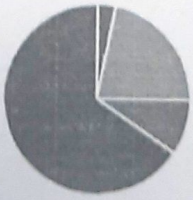
13. What does LoRa stand for? (1 point)
100% of respondents (32 of 32) answered this question correctly.

Low Radio	0	
Long Range	32	✓
Low Resolution	0	
Low Response	0	



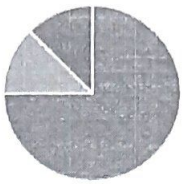
14. How many wires are used in SPI communication? (1 point)
22% of respondents (7 of 32) answered this question correctly.

1	1	
2	7	✓
3	3	
4	21	



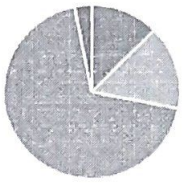
15. Which device initiates the data transfer in SPI communication? (1 point)
75% of respondents (24 of 32) answered this question correctly.

Master	24	✓
Slave	4	
Peripheral	0	
Controller	4	



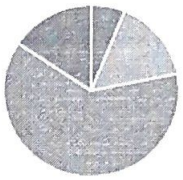
16. Which frequency bands are commonly used for LoRa communication? (1 point)
69% of respondents (22 of 32) answered this question correctly.

2.4 GHz	4	
5 GHz	5	
Sub-GHz (e.g., 433 MHz, 868 M...	22	✓
3Ghz	1	



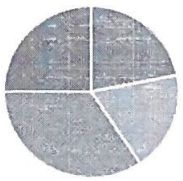
17. What is the typical range of LoRa communication in urban environments? (1 point)
63% of respondents (20 of 32) answered this question correctly.

Up to 100 meters	2	
Up to 1 kilometer	5	
Up to 10 kilometers	20	✓
Up to 100 kilometers	5	



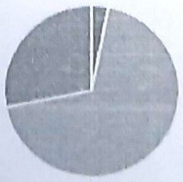
18. How does LoRa technology achieve long-range communication while conserving power? (1 point)
34% of respondents (11 of 32) answered this question correctly.

By using high transmit power	7	
By using short-range antennas	6	
By using low data rates and spr...	11	✓
By using high-frequency bands f..	8	



19. What is the typical operating voltage range for embedded systems? (1 point)
3% of respondents (1 of 32) answered this question correctly.

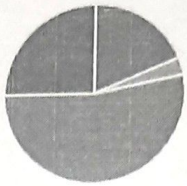
1.8V - 3.3V	1	✓
3.3V - 5V	22	
5V - 12V	9	
12V - 24V	0	



20. Which memory type is non-volatile and commonly used for storing configuration data in embedded systems? (1 point)

25% of respondents (8 of 32) answered this question correctly.

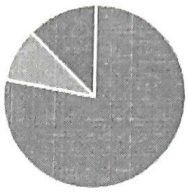
SRAM	6
DRAM	1
Flash memory	17
EEPROM	8 ✓



21. In I2C communication, which wires are used for data transfer? (1 point)

78% of respondents (25 of 32) answered this question correctly.

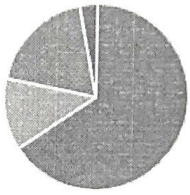
SDA (Serial Data) and SCL (Serial...	25 ✓
VCC and GND	3
MOSI and MISO	0
TXD and RXD	4



22. Which of the following is true about the "acknowledge" signal in I2C communication? (1 point)

3% of respondents (1 of 32) answered this question correctly.

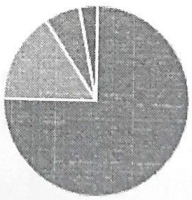
It indicates that the data was rec...	21
It indicates that the data was co...	4
It is sent by the master after rec...	6
It is sent by the slave after recei...	1 ✓



23. What is the typical data frame size in I2C communication? (1 point)

75% of respondents (24 of 32) answered this question correctly.

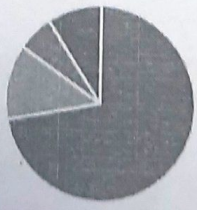
8 bits	24 ✓
16 bits	5
32 bits	2
64 bits	1



24. What is the purpose of the "stop" condition in I2C communication? (1 point)

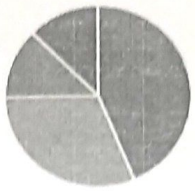
72% of respondents (23 of 32) answered this question correctly.

Indicates the end of data transfer	23 ✓
Resets the communication bus	4
Forces a restart of the communi...	2
Marks an error condition on the...	3



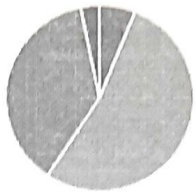
25. Which wire in SPI is responsible for transmitting data from the master to the slave? (1 point)
44% of respondents (14 of 32) answered this question correctly.

MOSI	14 ✓
MISO	10
SCK	4
SS	4



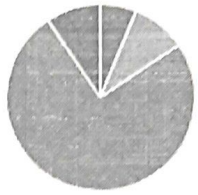
26. In SPI communication, which device initiates the data transfer? (1 point)
53% of respondents (17 of 32) answered this question correctly.

Slave	2
Master	17 ✓
Both simultaneously	12
None, it's automatic	1



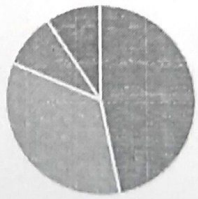
27. What is the function of the SS (Slave Select) line in SPI? (1 point)
75% of respondents (24 of 32) answered this question correctly.

Initiates data transfer	2
Indicates the start of a new frame	3
Selects which slave device to co...	24 ✓
Synchronizes the clocks betwee...	3



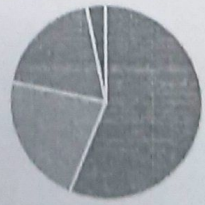
28. Which SPI mode allows data to be sampled on the leading edge of the clock and changed on the trailing edge? (1 point)
9% of respondents (3 of 32) answered this question correctly.

Mode 0	15
Mode 1	11
Mode 2	3
Mode 3	3 ✓



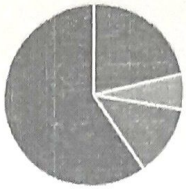
29. In SPI communication, what is the term for the group of bits transmitted as a single unit? (1 point)
22% of respondents (7 of 32) answered this question correctly.

Byte	18
Frame	7 ✓
Packet	6
Block	1



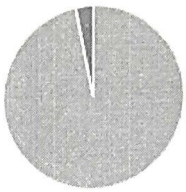
30. What is the maximum number of slave devices that can be connected to a single SPI bus? (1 point)
59% of respondents (19 of 32) answered this question correctly.

4	7
8	2
16	4
It depends on the master device	19 ✓



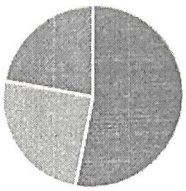
31. What does IoT stand for? (1 point)
97% of respondents (31 of 32) answered this question correctly.

Internet of Transactions	0
Internet of Things	31 ✓
Internet of Technology	0
Intranet of Things	1



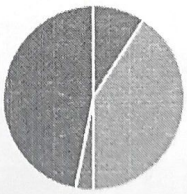
32. Which wireless communication protocol is commonly used for short-range IoT device communication? (1 point)
53% of respondents (17 of 32) answered this question correctly.

Zigbee	17 ✓
LTE	8
LoRa	7
WiMAX	0



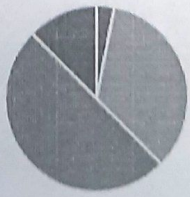
33. What is the purpose of MQTT (Message Queuing Telemetry Transport) in IoT? (1 point)
47% of respondents (15 of 32) answered this question correctly.

Secure device authentication	3
Real-time data streaming	13
Device discovery	1
Efficient message communication	15 ✓



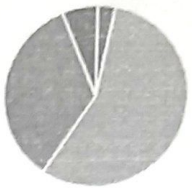
34. Which of the following is NOT a typical component of an IoT system? (1 point)
50% of respondents (16 of 32) answered this question correctly.

Sensor	1
Actuator	11
Web browser	16 ✓
Microcontroller	4



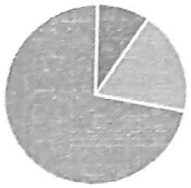
35. Which of the following is NOT a common IoT sensor type? (1 point)
34% of respondents (11 of 32) answered this question correctly.

Temperature sensor	1
Accelerometer	18
Barcode scanner	11 ✓
Light sensor	2



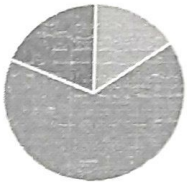
36. What type of network topology is commonly used in IoT deployments with a centralized hub connecting multiple devices? (1 point)
9% of respondents (3 of 32) answered this question correctly.

Star	3 ✓
Mesh	6
Bus	23
Ring	0



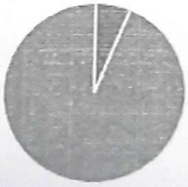
37. Which IoT application area focuses on optimizing energy usage in buildings? (1 point)
19% of respondents (6 of 32) answered this question correctly.

Smart agriculture	0
Industrial automation	5
Smart cities	21
Smart grid	6 ✓



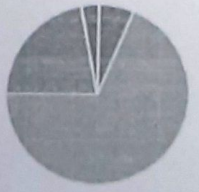
38. Who is often credited with coining the term "Internet of Things" (IoT)? (1 point)
94% of respondents (30 of 32) answered this question correctly.

Tim Berners-Lee	2
Bill Gates	0
Kevin Ashton	30 ✓
Mark Zuckerberg	0



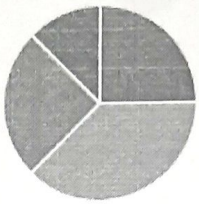
39. Who developed the I2C protocol? (1 point)
69% of respondents (22 of 32) answered this question correctly.

Robert Bosch GmbH	2
Philips Semiconductors (now N...	22 ✓
Intel Corporation	7
Texas Instruments	1



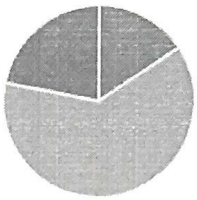
40. What was the original purpose behind the development of the I2C protocol? (1 point)
38% of respondents (12 of 32) answered this question correctly.

Interfacing microcontrollers wit...	8	
Communication between chips ...	12	✓
Linking computers with periphe...	8	
Networking home appliances	4	



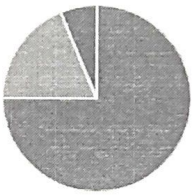
41. In I2C communication, what is the role of the SDA (Serial Data) line? (1 point)
63% of respondents (20 of 32) answered this question correctly.

It carries the clock signal.	5	
It carries the data signal.	20	✓
It selects the slave device.	0	
It synchronizes the clocks betwe...	7	



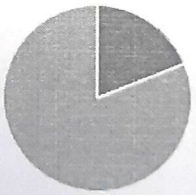
42. What are the two primary signals used in I2C communication? (1 point)
75% of respondents (24 of 32) answered this question correctly.

SDA and SCL	24	✓
MOSI and MISO	6	
TXD and RXD	0	
CLK and DATA	2	



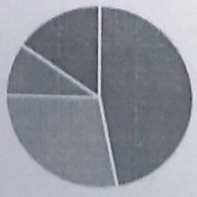
43. What does "CAN" stand for? (1 point)
81% of respondents (26 of 32) answered this question correctly.

Central Area Network	6	
Controller Area Network	26	✓
Computer Area Network	0	
Connection Area Network	0	



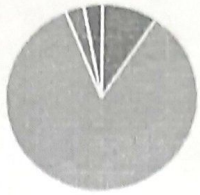
44. What is the typical operating frequency range of LoRa devices in the India? (1 point)
9% of respondents (3 of 32) answered this question correctly.

433 MHz	15	
868 MHz	9	
915 MHz	3	✓
2.4 GHz	5	



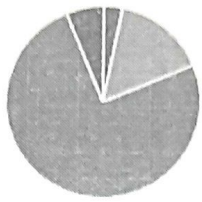
45. What is LiFi technology primarily used for? (1 point)
84% of respondents (27 of 32) answered this question correctly.

Wireless charging	3	
High-speed data communication	27	✓
Satellite communication	1	
GPS tracking	1	



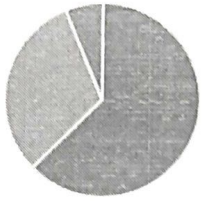
46. How does LiFi transmit data? (1 point)
75% of respondents (24 of 32) answered this question correctly.

Through radio waves	1	
Through infrared signals	5	
Through visible light	24	✓
Through microwaves	2	



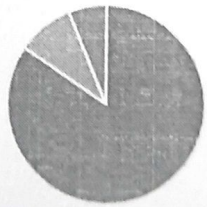
47. What is the key advantage of LiFi over traditional WiFi technology? (1 point)
63% of respondents (20 of 32) answered this question correctly.

Higher data transfer rates	20	✓
Longer range	10	
Lower cost	2	
Greater compatibility	0	



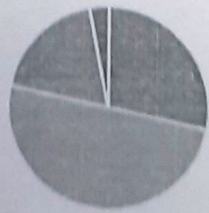
48. Who developed the CAN protocol? (1 point)
84% of respondents (27 of 32) answered this question correctly.

Bosch	27	✓
Intel Corporation	3	
IBM	2	
Motorola	0	

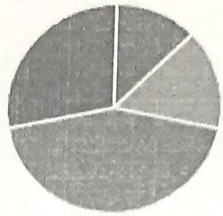


49. What is the primary application area of the CAN protocol? (1 point)
50% of respondents (16 of 32) answered this question correctly.

Home automation	9	
Industrial automation and auto...	16	✓
Wireless communication	6	
Satellite communication	1	

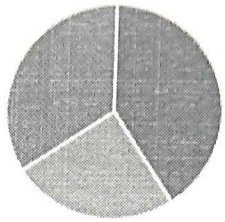


Clock speed	4	
Instruction set architecture	5	
On-chip memory and peripherals	14	✓
Compatibility with external devi...	9	



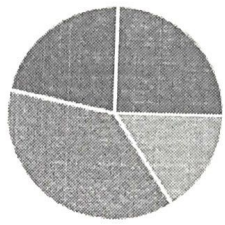
51. What is the primary function of a microprocessor? (1 point)
41% of respondents (13 of 32) answered this question correctly.

Execution of specific tasks or pr...	13	✓
Control of external devices	8	
Real-time data processing	11	
Power management	0	



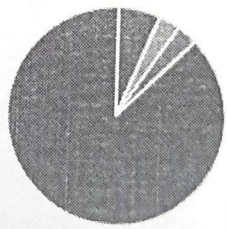
52. Which of the following components is typically NOT integrated into a microprocessor chip? (1 point)
38% of respondents (12 of 32) answered this question correctly.

Arithmetic logic unit (ALU)	8	
Control unit (CU)	5	
Random access memory (RAM)	12	✓
Input/output interfaces	7	



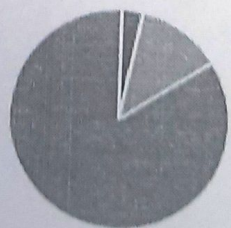
53. What is the primary function of a sensor? (1 point)
88% of respondents (28 of 32) answered this question correctly.

To process data	2	
To transmit data	1	
To receive data	1	
To detect changes in its environ...	28	✓



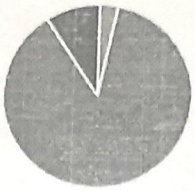
54. Which of the following is NOT a type of sensor? (1 point)
84% of respondents (27 of 32) answered this question correctly.

Temperature sensor	1	
Pressure sensor	4	
Actuator sensor	27	✓
Light sensor	0	



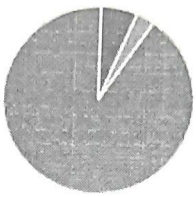
55. What is the primary function of an actuator? (1 point)
88% of respondents (28 of 32) answered this question correctly.

To sense changes in the environ...	0	
To process data	1	
To convert electrical signals into...	28	✓
To transmit data	3	



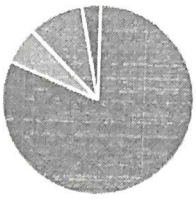
56. What is the primary application of a soil moisture sensor? (1 point)
91% of respondents (29 of 32) answered this question correctly.

Monitoring air quality	2	
Detecting water leaks	1	
Measuring the moisture content...	29	✓
Sensing temperature variations	0	



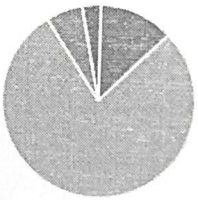
57. How does a soil moisture sensor typically measure moisture levels in soil? (1 point)
81% of respondents (26 of 32) answered this question correctly.

By analyzing electrical conductiv...	26	✓
By emitting ultrasonic waves	2	
By detecting changes in pressure	3	
By measuring light absorption	1	



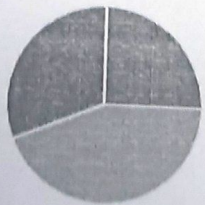
58. What is the main purpose of a water sensor? (1 point)
78% of respondents (25 of 32) answered this question correctly.

To measure water temperature	4	
To detect the presence of water ...	25	✓
To monitor water pressure	2	
To analyze water quality	1	



59. Which of the following types of water sensors is commonly used to prevent water damage in homes? (1 point)
44% of respondents (14 of 32) answered this question correctly.

Capacitive water sensor	8	
Conductive water sensor	14	✓
Optical water sensor	0	
Ultrasonic water sensor	10	



60. How does an ultrasonic sensor measure distance? (1 point)

59% of respondents (19 of 32) answered this question correctly.

- By emitting and receiving sound... 19 ✓
- By emitting and receiving radio ... 8
- By emitting and receiving light ... 3
- By emitting and receiving magn... 2

Course Incharges

HoD | ECE

Review: MCQ-Assessment-Value Added Course on "Embedded IoT with Node MCU and Raspberry PICO"

Respondent		Time to complete	Points
31	VIVEKA.S	65:01	40/60

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

1. What is an embedded system? *

- ○ A computer system with a large memory capacity
- ◉ A system designed to perform specific tasks within a larger system ✓
- ○ A system that relies solely on cloud computing
- ○ A system with no microcontroller or microprocessor

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

2. Which programming language is commonly used for embedded systems development? *

- ○ Java
- ○ Python
- ◉ C/C++ ✓
- ○ Ruby

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

3. What does I2C stand for? *

- ◉ Inter-Integrated Circuit ✓
- ○ Integrated 2 Circuits
- ○ Interface-to-Computer
- ○ Input/Output to Chip

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

4. How many wires are used in I2C communication? *

- ○ 1
- ◉ 2 ✓
- ○ 3
- ○ 4

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

5. Which of the following devices is NOT commonly found in an I2C network? *

- ○ Master
- ○ Slave
- ◉ Peripheral
- ○ Controller ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

6. What is the maximum number of devices that can be connected on an I2C bus? *

- ○ 64
- ◉ 128 ✓
- ○ 256
- ○ Unlimited

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

7. In I2C communication, which device generates the clock signal? *

- ◉ Master ✓
- ○ Slave
- ○ Both master and slave
- ○ Peripheral

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

8. Which of the following is a disadvantage of I2C communication? *

- (●) Limited distance between devices ✓
- ( ) High power consumption
- ( ) Complexity in implementation
- ( ) Incompatibility with different devices

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

9. What is the maximum data rate supported by standard I2C communication? *

- ( ) 100 kbps
- (●) 400 kbps ✓
- ( ) 1 Mbps
- ( ) 10 Mbps

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

10. What does SPI stand for? *

- (●) Serial Peripheral Interface ✓
- ( ) Simple Peripheral Interface
- ( ) Serial Protocol Interface
- ( ) Single Pin Interface

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

11. What is the primary advantage of LoRa (Long Range) technology in wireless communication? *

- (●) High data rate
- ( ) Low power consumption ✓
- ( ) Short range communication
- ( ) High-frequency bands usage

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

12. In SPI communication, what is the role of the Chip Select (CS) signal? *

- ○ It generates the clock signal for synchronization
- ◉ It indicates the start and end of data transmission
- ○ It selects the specific slave device with which the master wants to communicate ✓
- ○ It controls the direction of data flow on the bus

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

13. What does LoRa stand for? *

- ○ Low Radio
- ◉ Long Range ✓
- ○ Low Resolution
- ○ Low Response

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

14. How many wires are used in SPI communication? *

- ○ 1
- ○ 2 ✓
- ○ 3
- ◉ 4

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

15. Which device initiates the data transfer in SPI communication? *

- ◉ Master ✓
- ○ Slave
- ○ Peripheral
- ○ Controller

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

16. Which frequency bands are commonly used for LoRa communication? *

- ○ 2.4 GHz
- ○ 5 GHz
- ◉ Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz) ✓
- ○ 3Ghz

✕ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

17. What is the typical range of LoRa communication in urban environments? *

- ○ Up to 100 meters
- ○ Up to 1 kilometer
- ○ Up to 10 kilometers ✓
- ◉ Up to 100 kilometers

✕ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

18. How does LoRa technology achieve long-range communication while conserving power? *

- ◉ By using high transmit power
- ○ By using short-range antennas
- ○ By using low data rates and spread spectrum modulation ✓
- ○ By using high-frequency bands for transmission

✕ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

19. What is the typical operating voltage range for embedded systems? *

- ○ 1.8V - 3.3V ✓
- ○ 3.3V - 5V
- ◉ 5V - 12V
- ○ 12V - 24V

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

20. Which memory type is non-volatile and commonly used for storing configuration data in embedded systems? *

- ○ SRAM
- ○ DRAM
- ◉ Flash memory
- ○ EEPROM ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

21. In I2C communication, which wires are used for data transfer? *

- ◉ SDA (Serial Data) and SCL (Serial Clock) ✓
- ○ VCC and GND
- ○ MOSI and MISO
- ○ TXD and RXD

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

22. Which of the following is true about the "acknowledge" signal in I2C communication? *

- ○ It indicates that the data was received successfully by the receiver.
- ◉ It indicates that the data was corrupted during transmission.
- ○ It is sent by the master after receiving data from the slave.
- ○ It is sent by the slave after receiving data from the master. ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

23. What is the typical data frame size in I2C communication? *

- ◉ 8 bits ✓
- ○ 16 bits
- ○ 32 bits
- ○ 64 bits

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

24. What is the purpose of the "stop" condition in I2C communication? *

- ○ Indicates the end of data transfer ✓
- ○ Resets the communication bus
- ○ Forces a restart of the communication
- ◉ Marks an error condition on the bus

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

25. Which wire in SPI is responsible for transmitting data from the master to the slave? *

- ◉ MOSI ✓
- ○ MISO
- ○ SCK
- ○ SS

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

26. In SPI communication, which device initiates the data transfer? *

- ○ Slave
- ◉ Master ✓
- ○ Both simultaneously
- ○ None, it's automatic

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

27. What is the function of the SS (Slave Select) line in SPI? *

- ○ Initiates data transfer
- ○ Indicates the start of a new frame
- ◉ Selects which slave device to communicate with ✓
- ○ Synchronizes the clocks between master and slave

0 / 1 pt
Auto-graded

✕ **Incorrect** 0/1 Points

28. Which SPI mode allows data to be sampled on the leading edge of the clock and changed on the trailing edge? *

- (●) Mode 0
- ( ) Mode 1
- ( ) Mode 2
- ( ) Mode 3 ✓

1 / 1 pt
Auto-graded

✓ **Correct** 1/1 Points

29. In SPI communication, what is the term for the group of bits transmitted as a single unit? *

- ( ) Byte
- (●) Frame ✓
- ( ) Packet
- ( ) Block

1 / 1 pt
Auto-graded

✓ **Correct** 1/1 Points

30. What is the maximum number of slave devices that can be connected to a single SPI bus? *

- ( ) 4
- ( ) 8
- ( ) 16
- (●) It depends on the master device ✓

1 / 1 pt
Auto-graded

✓ **Correct** 1/1 Points

31. What does IoT stand for? *

- ( ) Internet of Transactions
- (●) Internet of Things ✓
- ( ) Internet of Technology
- ( ) Intranet of Things

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

32. Which wireless communication protocol is commonly used for short-range IoT device communication? *

- [x] Zigbee ✓
- [ ] LTE
- [ ] LoRa
- [ ] WiMAX

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

33. What is the purpose of MQTT (Message Queuing Telemetry Transport) in IoT? *

- [ ] Secure device authentication
- [ ] Real-time data streaming
- [ ] Device discovery
- [x] Efficient message communication ✓

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

34. Which of the following is NOT a typical component of an IoT system? *

- [ ] Sensor
- [ ] Actuator
- [ ] Web browser ✓
- [x] Microcontroller

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

35. Which of the following is NOT a common IoT sensor type? *

- [ ] Temperature sensor
- [x] Accelerometer
- [ ] Barcode scanner ✓
- [ ] Light sensor

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

36. What type of network topology is commonly used in IoT deployments with a centralized hub connecting multiple devices? *

- (●) Star ✓
- ( ) Mesh
- ( ) Bus
- ( ) Ring

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

37. Which IoT application area focuses on optimizing energy usage in buildings? *

- ( ) Smart agriculture
- ( ) Industrial automation
- (●) Smart cities
- ( ) Smart grid ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

38. Who is often credited with coining the term "Internet of Things" (IoT)? *

- ( ) Tim Berners-Lee
- ( ) Bill Gates
- (●) Kevin Ashton ✓
- ( ) Mark Zuckerberg

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

39. Who developed the I2C protocol? *

- ( ) Robert Bosch GmbH
- (●) Philips Semiconductors (now NXP Semiconductors) ✓
- ( ) Intel Corporation
- ( ) Texas Instruments

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

40. What was the original purpose behind the development of the I2C protocol? *

- ○ Interfacing microcontrollers with displays
- ◉ Communication between chips on a TV set ✓
- ○ Linking computers with peripherals
- ○ Networking home appliances

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

41. In I2C communication, what is the role of the SDA (Serial Data) line? *

- ○ It carries the clock signal.
- ◉ It carries the data signal. ✓
- ○ It selects the slave device.
- ○ It synchronizes the clocks between master and slave.

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

42. What are the two primary signals used in I2C communication? *

- ◉ SDA and SCL ✓
- ○ MOSI and MISO
- ○ TXD and RXD
- ○ CLK and DATA

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

43. What does "CAN" stand for? *

- ○ Central Area Network
- ◉ Controller Area Network ✓
- ○ Computer Area Network
- ○ Connection Area Network

✕ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

44. What is the typical operating frequency range of LoRa devices in the India? *

- (●) 433 MHz
- ( ) 868 MHz
- ( ) 915 MHz ✓
- ( ) 2.4 GHz

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

45. What is LiFi technology primarily used for? *

- ( ) Wireless charging
- (●) High-speed data communication ✓
- ( ) Satellite communication
- ( ) GPS tracking

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

46. How does LiFi transmit data? *

- ( ) Through radio waves
- ( ) Through infrared signals
- (●) Through visible light ✓
- ( ) Through microwaves

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

47. What is the key advantage of LiFi over traditional WiFi technology? *

- (●) Higher data transfer rates ✓
- ( ) Longer range
- ( ) Lower cost
- ( ) Greater compatibility

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

48. Who developed the CAN protocol? *

- (●) Bosch ✓
- ( ) Intel Corporation
- ( ) IBM
- ( ) Motorola

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

49. What is the primary application area of the CAN protocol? *

- ( ) Home automation
- ( ) Industrial automation and automotive systems ✓
- ( ) Wireless communication
- (●) Satellite communication

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

50. Which feature distinguishes a microcontroller from a microprocessor? *

- ( ) Clock speed
- ( ) Instruction set architecture
- (●) On-chip memory and peripherals ✓
- ( ) Compatibility with external devices

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

51. What is the primary function of a microprocessor? *

- ( ) Execution of specific tasks or programs ✓
- (●) Control of external devices
- ( ) Real-time data processing
- ( ) Power management

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

52. Which of the following components is typically NOT integrated into a microprocessor chip? *

- ○ Arithmetic logic unit (ALU)
- ○ Control unit (CU)
- ○ Random access memory (RAM) ✓
- ◉ Input/output interfaces

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

53. What is the primary function of a sensor? *

- ○ To process data
- ○ To transmit data
- ○ To receive data
- ◉ To detect changes in its environment ✓

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

54. Which of the following is NOT a type of sensor? *

- ○ Temperature sensor
- ◉ Pressure sensor
- ○ Actuator sensor ✓
- ○ Light sensor

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

55. What is the primary function of an actuator? *

- ○ To sense changes in the environment
- ○ To process data
- ◉ To convert electrical signals into physical action ✓
- ○ To transmit data

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

56. What is the primary application of a soil moisture sensor? *

- ○ Monitoring air quality
- ○ Detecting water leaks
- ◉ Measuring the moisture content in soil ✓
- ○ Sensing temperature variations

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

57. How does a soil moisture sensor typically measure moisture levels in soil? *

- ○ By analyzing electrical conductivity ✓
- ◉ By emitting ultrasonic waves
- ○ By detecting changes in pressure
- ○ By measuring light absorption

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

58. What is the main purpose of a water sensor? *

- ○ To measure water temperature
- ◉ To detect the presence of water or moisture ✓
- ○ To monitor water pressure
- ○ To analyze water quality

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

59. Which of the following types of water sensors is commonly used to prevent water damage in homes? *

- ○ Capacitive water sensor
- ◉ Conductive water sensor ✓
- ○ Optical water sensor
- ○ Ultrasonic water sensor

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

60. How does an ultrasonic sensor measure distance? *

- (●) By emitting and receiving sound waves ✓
- ( ) By emitting and receiving radio waves
- ( ) By emitting and receiving light waves
- ( ) By emitting and receiving magnetic fields

Course Incharges

HoD/ECE
22/4/24

Review: MCQ-Assessment-Value Added Course on "Embedded IoT with Node MCU and Raspberry PICO"

Respondent		Time to complete	Points
1	IMMANUVEL.L	21:23	38/60

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

1. What is an embedded system? *

- ○ A computer system with a large memory capacity
- ◉ A system designed to perform specific tasks within a larger system ✓
- ○ A system that relies solely on cloud computing
- ○ A system with no microcontroller or microprocessor

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

2. Which programming language is commonly used for embedded systems development? *

- ○ Java
- ○ Python
- ◉ C/C++ ✓
- ○ Ruby

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

3. What does I2C stand for? *

- ◉ Inter-Integrated Circuit ✓
- ○ Integrated 2 Circuits
- ○ Interface-to-Computer
- ○ Input/Output to Chip

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

4. How many wires are used in I2C communication? *

- ○ 1
- ◉ 2 ✓
- ○ 3
- ○ 4

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

5. Which of the following devices is NOT commonly found in an I2C network? *

- ○ Master
- ○ Slave
- ◉ Peripheral
- ○ Controller ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

6. What is the maximum number of devices that can be connected on an I2C bus? *

- ○ 64
- ◉ 128 ✓
- ○ 256
- ○ Unlimited

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

7. In I2C communication, which device generates the clock signal? *

- ◉ Master ✓
- ○ Slave
- ○ Both master and slave
- ○ Peripheral

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

8. Which of the following is a disadvantage of I2C communication? *

- (●) Limited distance between devices ✓
- ( ) High power consumption
- ( ) Complexity in implementation
- ( ) Incompatibility with different devices

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

9. What is the maximum data rate supported by standard I2C communication? *

- ( ) 100 kbps
- (●) 400 kbps ✓
- ( ) 1 Mbps
- ( ) 10 Mbps

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

10. What does SPI stand for? *

- (●) Serial Peripheral Interface ✓
- ( ) Simple Peripheral Interface
- ( ) Serial Protocol Interface
- ( ) Single Pin Interface

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

11. What is the primary advantage of LoRa (Long Range) technology in wireless communication? *

- ( ) High data rate
- (●) Low power consumption ✓
- ( ) Short range communication
- ( ) High-frequency bands usage

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

12. In SPI communication, what is the role of the Chip Select (CS) signal? *

- ○ It generates the clock signal for synchronization
- ○ It indicates the start and end of data transmission
- ◉ It selects the specific slave device with which the master wants to communicate ✓
- ○ It controls the direction of data flow on the bus

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

13. What does LoRa stand for? *

- ○ Low Radio
- ◉ Long Range ✓
- ○ Low Resolution
- ○ Low Response

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

14. How many wires are used in SPI communication? *

- ○ 1
- ○ 2 ✓
- ○ 3
- ◉ 4

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

15. Which device initiates the data transfer in SPI communication? *

- ◉ Master ✓
- ○ Slave
- ○ Peripheral
- ○ Controller

✓ Correct 1/1 Points

1 / 1 pt
Auto-graded

16. Which frequency bands are commonly used for LoRa communication? *

- 2.4 GHz
- 5 GHz
- Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz) ✓
- 3Ghz

✗ Incorrect 0/1 Points

0 / 1 pt
Auto-graded

17. What is the typical range of LoRa communication in urban environments? *

- Up to 100 meters
- Up to 1 kilometer
- Up to 10 kilometers ✓
- Up to 100 kilometers

✓ Correct 1/1 Points

1 / 1 pt
Auto-graded

18. How does LoRa technology achieve long-range communication while conserving power? *

- By using high transmit power
- By using short-range antennas
- By using low data rates and spread spectrum modulation ✓
- By using high-frequency bands for transmission

✗ Incorrect 0/1 Points

0 / 1 pt
Auto-graded

19. What is the typical operating voltage range for embedded systems? *

- 1.8V - 3.3V ✓
- 3.3V - 5V
- 5V - 12V
- 12V - 24V

✕ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

20. Which memory type is non-volatile and commonly used for storing configuration data in embedded systems? *

- ○ SRAM
- ○ DRAM
- ● Flash memory
- ○ EEPROM ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

21. In I2C communication, which wires are used for data transfer? *

- ● SDA (Serial Data) and SCL (Serial Clock) ✓
- ○ VCC and GND
- ○ MOSI and MISO
- ○ TXD and RXD

✕ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

22. Which of the following is true about the "acknowledge" signal in I2C communication? *

- ● It indicates that the data was received successfully by the receiver.
- ○ It indicates that the data was corrupted during transmission.
- ○ It is sent by the master after receiving data from the slave.
- ○ It is sent by the slave after receiving data from the master. ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

23. What is the typical data frame size in I2C communication? *

- ● 8 bits ✓
- ○ 16 bits
- ○ 32 bits
- ○ 64 bits

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

24. What is the purpose of the "stop" condition in I2C communication? *

- (●) Indicates the end of data transfer ✓
- ( ) Resets the communication bus
- ( ) Forces a restart of the communication
- ( ) Marks an error condition on the bus

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

25. Which wire in SPI is responsible for transmitting data from the master to the slave? *

- (●) MOSI ✓
- ( ) MISO
- ( ) SCK
- ( ) SS

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

26. In SPI communication, which device initiates the data transfer? *

- ( ) Slave
- ( ) Master ✓
- (●) Both simultaneously
- ( ) None, it's automatic

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

27. What is the function of the SS (Slave Select) line in SPI? *

- ( ) Initiates data transfer
- ( ) Indicates the start of a new frame
- (●) Selects which slave device to communicate with ✓
- ( ) Synchronizes the clocks between master and slave

✕ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

28. Which SPI mode allows data to be sampled on the leading edge of the clock and changed on the trailing edge? *

- ○ Mode 0
- ◉ Mode 1
- ○ Mode 2
- ○ Mode 3 ✓

✕ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

29. In SPI communication, what is the term for the group of bits transmitted as a single unit? *

- ◉ Byte
- ○ Frame ✓
- ○ Packet
- ○ Block

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

30. What is the maximum number of slave devices that can be connected to a single SPI bus? *

- ○ 4
- ○ 8
- ○ 16
- ◉ It depends on the master device ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

31. What does IoT stand for? *

- ○ Internet of Transactions
- ◉ Internet of Things ✓
- ○ Internet of Technology
- ○ Intranet of Things

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

28. Which SPI mode allows data to be sampled on the leading edge of the clock and changed on the trailing edge? *

- ○ Mode 0
- ◉ Mode 1
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- ◉ Internet of Things ✓
- ○ Internet of Technology
- ○ Intranet of Things

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

32. Which wireless communication protocol is commonly used for short-range IoT device communication? *

- ○ Zigbee ✓
- ○ LTE
- ◉ LoRa
- ○ WiMAX

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

33. What is the purpose of MQTT (Message Queuing Telemetry Transport) in IoT? *

- ○ Secure device authentication
- ○ Real-time data streaming
- ○ Device discovery
- ◉ Efficient message communication ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

34. Which of the following is NOT a typical component of an IoT system? *

- ○ Sensor
- ○ Actuator
- ◉ Web browser ✓
- ○ Microcontroller

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

35. Which of the following is NOT a common IoT sensor type? *

- ○ Temperature sensor
- ◉ Accelerometer
- ○ Barcode scanner ✓
- ○ Light sensor

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

36. What type of network topology is commonly used in IoT deployments with a centralized hub connecting multiple devices? *

- ○ Star ✓
- ○ Mesh
- ◉ Bus
- ○ Ring

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

37. Which IoT application area focuses on optimizing energy usage in buildings? *

- ○ Smart agriculture
- ○ Industrial automation
- ◉ Smart cities
- ○ Smart grid ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

38. Who is often credited with coining the term "Internet of Things" (IoT)? *

- ○ Tim Berners-Lee
- ○ Bill Gates
- ◉ Kevin Ashton ✓
- ○ Mark Zuckerberg

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

39. Who developed the I2C protocol? *

- ○ Robert Bosch GmbH
- ◉ Philips Semiconductors (now NXP Semiconductors) ✓
- ○ Intel Corporation
- ○ Texas Instruments

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

40. What was the original purpose behind the development of the I2C protocol? *

- ○ Interfacing microcontrollers with displays
- ◉ Communication between chips on a TV set ✓
- ○ Linking computers with peripherals
- ○ Networking home appliances

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

41. In I2C communication, what is the role of the SDA (Serial Data) line? *

- ○ It carries the clock signal.
- ◉ It carries the data signal. ✓
- ○ It selects the slave device.
- ○ It synchronizes the clocks between master and slave.

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

42. What are the two primary signals used in I2C communication? *

- ◉ SDA and SCL ✓
- ○ MOSI and MISO
- ○ TXD and RXD
- ○ CLK and DATA

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

43. What does "CAN" stand for? *

- ○ Central Area Network
- ◉ Controller Area Network ✓
- ○ Computer Area Network
- ○ Connection Area Network

✕ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

44. What is the typical operating frequency range of LoRa devices in the India? *

- (●) 433 MHz
- ( ) 868 MHz
- ( ) 915 MHz ✓
- ( ) 2.4 GHz

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

45. What is LiFi technology primarily used for? *

- ( ) Wireless charging
- (●) High-speed data communication ✓
- ( ) Satellite communication
- ( ) GPS tracking

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1 / 1 pt
Auto-graded

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- (●) Through visible light ✓
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0 / 1 pt
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0 / 1 pt
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- ◉ Intel Corporation
- ○ IBM
- ○ Motorola

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1 / 1 pt
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0 / 1 pt
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Auto-graded

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1 / 1 pt
Auto-graded

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- ( ) To receive data
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1 / 1 pt
Auto-graded

✓ **Correct** 1/1 Points

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- ( ) Pressure sensor
- (●) Actuator sensor ✓
- ( ) Light sensor

1 / 1 pt
Auto-graded

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1 / 1 pt
Auto-graded

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- ◉ Measuring the moisture content in soil ✓
- ○ Sensing temperature variations

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1 / 1 pt
Auto-graded

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- ○ By emitting ultrasonic waves
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0 / 1 pt
Auto-graded

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Auto-graded

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Course Incharges

HOD | ECE

Review: MCQ-Assessment-Value Added Course on "Embedded IoT with Node MCU and Raspberry PICO"

Respondent		Time to complete	Points
32	KISHORKUMAR.R	08:34	51/60

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

1. What is an embedded system? *

- ○ A computer system with a large memory capacity
- ◉ A system designed to perform specific tasks within a larger system ✓
- ○ A system that relies solely on cloud computing
- ○ A system with no microcontroller or microprocessor

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

2. Which programming language is commonly used for embedded systems development? *

- ○ Java
- ○ Python
- ○ C/C++ ✓
- ◉ Ruby

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

3. What does I2C stand for? *

- ◉ Inter-Integrated Circuit ✓
- ○ Integrated 2 Circuits
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1 / 1 pt
Auto-graded

4. How many wires are used in I2C communication? *

- ○ 1
- ◉ 2 ✓
- ○ 3
- ○ 4

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

5. Which of the following devices is NOT commonly found in an I2C network? *

- ○ Master
- ○ Slave
- ○ Peripheral
- ◉ Controller ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

6. What is the maximum number of devices that can be connected on an I2C bus? *

- ○ 64
- ◉ 128 ✓
- ○ 256
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0 / 1 pt
Auto-graded

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1 / 1 pt
Auto-graded

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- (●) Limited distance between devices ✓
- ( ) High power consumption
- ( ) Complexity in implementation
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✓ **Correct** 1/1 Points

1 / 1 pt
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- ○ 5 GHz
- ◉ Sub-GHz (e.g., 433 MHz, 868 MHz, 915 MHz) ✓
- ○ 3Ghz

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

17. What is the typical range of LoRa communication in urban environments? *

- ○ Up to 100 meters
- ○ Up to 1 kilometer
- ◉ Up to 10 kilometers ✓
- ○ Up to 100 kilometers

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

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1 / 1 pt
Auto-graded

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- ○ 5V - 12V
- ○ 12V - 24V

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- ○ Flash memory
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1 / 1 pt
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- ○ TXD and RXD

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

22. Which of the following is true about the "acknowledge" signal in I2C communication? *

- ○ It indicates that the data was received successfully by the receiver.
- ○ It indicates that the data was corrupted during transmission.
- ● It is sent by the master after receiving data from the slave.
- ○ It is sent by the slave after receiving data from the master. ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

23. What is the typical data frame size in I2C communication? *

- ● 8 bits ✓
- ○ 16 bits
- ○ 32 bits
- ○ 64 bits

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

24. What is the purpose of the "stop" condition in I2C communication? *

- (●) Indicates the end of data transfer ✓
- ( ) Resets the communication bus
- ( ) Forces a restart of the communication
- ( ) Marks an error condition on the bus

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

25. Which wire in SPI is responsible for transmitting data from the master to the slave? *

- (●) MOSI ✓
- ( ) MISO
- ( ) SCK
- ( ) SS

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

26. In SPI communication, which device initiates the data transfer? *

- ( ) Slave
- (●) Master ✓
- ( ) Both simultaneously
- ( ) None, it's automatic

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

27. What is the function of the SS (Slave Select) line in SPI? *

- ( ) Initiates data transfer
- ( ) Indicates the start of a new frame
- (●) Selects which slave device to communicate with ✓
- ( ) Synchronizes the clocks between master and slave

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

28. Which SPI mode allows data to be sampled on the leading edge of the clock and changed on the trailing edge? *

- ○ Mode 0
- ○ Mode 1
- ○ Mode 2
- ● Mode 3 ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

29. In SPI communication, what is the term for the group of bits transmitted as a single unit? *

- ○ Byte
- ● Frame ✓
- ○ Packet
- ○ Block

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

30. What is the maximum number of slave devices that can be connected to a single SPI bus? *

- ● 4
- ○ 8
- ○ 16
- ○ It depends on the master device ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

31. What does IoT stand for? *

- ○ Internet of Transactions
- ● Internet of Things ✓
- ○ Internet of Technology
- ○ Intranet of Things

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

32. Which wireless communication protocol is commonly used for short-range IoT device communication? *

- ○ Zigbee ✓
- ◉ LTE
- ○ LoRa
- ○ WiMAX

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

33. What is the purpose of MQTT (Message Queuing Telemetry Transport) in IoT? *

- ○ Secure device authentication
- ○ Real-time data streaming
- ○ Device discovery
- ◉ Efficient message communication ✓

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

34. Which of the following is NOT a typical component of an IoT system? *

- ○ Sensor
- ◉ Actuator
- ○ Web browser ✓
- ○ Microcontroller

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

35. Which of the following is NOT a common IoT sensor type? *

- ○ Temperature sensor
- ○ Accelerometer
- ◉ Barcode scanner ✓
- ○ Light sensor

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

36. What type of network topology is commonly used in IoT deployments with a centralized hub connecting multiple devices? *

- (●) Star ✓
- ( ) Mesh
- ( ) Bus
- ( ) Ring

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

37. Which IoT application area focuses on optimizing energy usage in buildings? *

- ( ) Smart agriculture
- ( ) Industrial automation
- ( ) Smart cities
- (●) Smart grid ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

38. Who is often credited with coining the term "Internet of Things" (IoT)? *

- ( ) Tim Berners-Lee
- ( ) Bill Gates
- (●) Kevin Ashton ✓
- ( ) Mark Zuckerberg

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

39. Who developed the I2C protocol? *

- ( ) Robert Bosch GmbH
- (●) Philips Semiconductors (now NXP Semiconductors) ✓
- ( ) Intel Corporation
- ( ) Texas Instruments

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

40. What was the original purpose behind the development of the I2C protocol? *

- ○ Interfacing microcontrollers with displays
- ◉ Communication between chips on a TV set ✓
- ○ Linking computers with peripherals
- ○ Networking home appliances

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

41. In I2C communication, what is the role of the SDA (Serial Data) line? *

- ○ It carries the clock signal.
- ◉ It carries the data signal. ✓
- ○ It selects the slave device.
- ○ It synchronizes the clocks between master and slave.

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

42. What are the two primary signals used in I2C communication? *

- ○ SDA and SCL ✓
- ◉ MOSI and MISO
- ○ TXD and RXD
- ○ CLK and DATA

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

43. What does "CAN" stand for? *

- ○ Central Area Network
- ◉ Controller Area Network ✓
- ○ Computer Area Network
- ○ Connection Area Network

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

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✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

44. What is the typical operating frequency range of LoRa devices in the India? *

- ○ 433 MHz
- ○ 868 MHz
- ◉ 915 MHz ✓
- ○ 2.4 GHz

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

45. What is LiFi technology primarily used for? *

- ○ Wireless charging
- ◉ High-speed data communication ✓
- ○ Satellite communication
- ○ GPS tracking

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

46. How does LiFi transmit data? *

- ○ Through radio waves
- ○ Through infrared signals
- ◉ Through visible light ✓
- ○ Through microwaves

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

47. What is the key advantage of LiFi over traditional WiFi technology? *

- ◉ Higher data transfer rates ✓
- ○ Longer range
- ○ Lower cost
- ○ Greater compatibility

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

48. Who developed the CAN protocol? *

- (●) Bosch ✓
- ( ) Intel Corporation
- ( ) IBM
- ( ) Motorola

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

49. What is the primary application area of the CAN protocol? *

- ( ) Home automation
- (●) Industrial automation and automotive systems ✓
- ( ) Wireless communication
- ( ) Satellite communication

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

50. Which feature distinguishes a microcontroller from a microprocessor? *

- ( ) Clock speed
- ( ) Instruction set architecture
- (●) On-chip memory and peripherals ✓
- ( ) Compatibility with external devices

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

51. What is the primary function of a microprocessor? *

- (●) Execution of specific tasks or programs ✓
- ( ) Control of external devices
- ( ) Real-time data processing
- ( ) Power management

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

52. Which of the following components is typically NOT integrated into a microprocessor chip? *

- ○ Arithmetic logic unit (ALU)
- ○ Control unit (CU)
- ● Random access memory (RAM) ✓
- ○ Input/output interfaces

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

53. What is the primary function of a sensor? *

- ○ To process data
- ○ To transmit data
- ○ To receive data
- ● To detect changes in its environment ✓

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

54. Which of the following is NOT a type of sensor? *

- ○ Temperature sensor
- ○ Pressure sensor
- ● Actuator sensor ✓
- ○ Light sensor

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

55. What is the primary function of an actuator? *

- ○ To sense changes in the environment
- ○ To process data
- ● To convert electrical signals into physical action ✓
- ○ To transmit data

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

56. What is the primary application of a soil moisture sensor? *

- ○ Monitoring air quality
- ○ Detecting water leaks
- ◉ Measuring the moisture content in soil ✓
- ○ Sensing temperature variations

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

57. How does a soil moisture sensor typically measure moisture levels in soil? *

- ◉ By analyzing electrical conductivity ✓
- ○ By emitting ultrasonic waves
- ○ By detecting changes in pressure
- ○ By measuring light absorption

✗ **Incorrect** 0/1 Points

0 / 1 pt
Auto-graded

58. What is the main purpose of a water sensor? *

- ◉ To measure water temperature
- ○ To detect the presence of water or moisture ✓
- ○ To monitor water pressure
- ○ To analyze water quality

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

59. Which of the following types of water sensors is commonly used to prevent water damage in homes? *

- ○ Capacitive water sensor
- ◉ Conductive water sensor ✓
- ○ Optical water sensor
- ○ Ultrasonic water sensor

✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

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✓ **Correct** 1/1 Points

1 / 1 pt
Auto-graded

60. How does an ultrasonic sensor measure distance? *

- (●) By emitting and receiving sound waves ✓
- ( ) By emitting and receiving radio waves
- ( ) By emitting and receiving light waves
- ( ) By emitting and receiving magnetic fields

Course Incharges

HoD/ECE

KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

Value Added Course on Embedded IoT with Node MCU and Raspberry Pico(12.02.2024 to 17.02.2024)

Department of Electronics and Communication Engineering

Name of the Judge: Mr.R.Ashok, AP/ECE

SLNo	Roll Number	Register Number	Name of the Student	Title of the Project	Presentation (10mark)	Content (5mark)	Progress of work (5 mark)	Queries (5 mark)	Report (15 marks)	Total (40 marks)
1	22UEC004	920422106025	JERLACE SELIN E	Raindrop Sensor	6	3	4	3	12	28
	22UEC041	920422106058	VIVEKA S							
2	22UEC006	920422106020	HEMASRI S	Gas Leakage detection	8	4	4	4	14	34
	22UEC021	920422106006	ATCHAYA KARTHIKA S							
3	22UEC007	920422106055	VARSHA DEVI P	IoT based Automatic Plant Waterer	8	4	4	4	12	32
	22UEC029	920422106002	ARCHANA P							
4	22UEC011	920422106056	VENKATA HARISH S C	Automatic trolley using IoT	8	4	4	4	10	30
	22UEC027	920422106028	KISHORKUMAR R							
	22UEC063	920422106304	MEYYALAGAN.M							
5	22UEC012	920422106018	GANESAN B	Automatic water tank sensor (Level)	7	3	3	2	10	25
	22UEC013	920422106031	MOHAMED IMRAN FARITH S							

6	22UEC014	920422106046	SANTHOSH KUMAR S	Door lock with Face Recognition	7	4	4	3	8	26
	22UEC015	920422106032	NAVEEN PRASATH S							
7	22UEC022	920422106030	MARIESWARI M	IoT patient health monitoring system	10	5	5	4	14	38
	22UEC045	920422106053	R TEJASWI							
8	22UEC023	920422106012	DHANUSHDEVA C	Prevention of road accident by using NodeMCU and IoT Platforms	10	4	4	4	13	35
	22UEC055	920422106004	ARUN KUMAR M							
	22UEC057	920422106017	EBBY ALLAN RAJ A							
9	22UEC024	920422106013	DHARSHINI V	Fire Alerting System	10	4	4	5	14	37
	22UEC026	920422106043	RITHIKA J							
10	22UEC031	920422106045	SANKAR M	Theft Detection	7	3	3	3	12	28
	22UEC051	920422106034	PRADEEPKUMAR S							
	22UEC053	920422106005	ASHIF AHAMED J							
11	22UEC034	920422106011	DHANUSH G	Weather Station	8	2	3	3	13	29
	22UEC040	920422106022	IMMANUVEL L							
	22UEC049	920422106057	VIMALRAJ S							
12	22UEC035	920422106014	DHARUN VAISHNAV S	Obstacle detection	7	3	3	3	12	28
	22UEC047	920422106001	AMEER AJMAL M B							
13	22UEC028	920422106042	RESHMA R	IoT home automation using Raspberry Pi	8	4	5	4	14	35
	22UEC039	920422106015	DHESIKA K M S							
14	22UEC052	920422106024	JENISHA S	Air monitoring system using Raspberry Pico	8	4	5	4	14	35
	22UEC054	920422106047	SHRUTIKA V							

Signature of the Judge

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Value Added Course on Embedded IoT with Node MCU and Raspberry Pico(12.02.2024 to 17.02.2024)

Department of Electronics and Communication Engineering

Name of the Judge: Dr.N.M.Mary Sindhuja, ASP/ECE

Sl.No	Roll Number	Register Number	Name of the Student	Title of the Project	Presentation (10mark)	Content (5mark)	Progress of work (5 mark)	Queries (5 mark)	Report (15 marks)	Total (40 marks)
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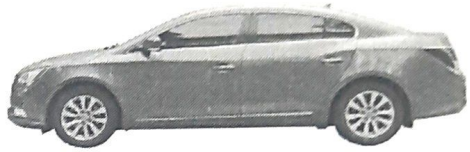
Signature of the Judge

KAMARAJ COLLEGE OF ENGINEERING AND TECHNOLOGY
(AN AUTONOMOUS INSITITUION)

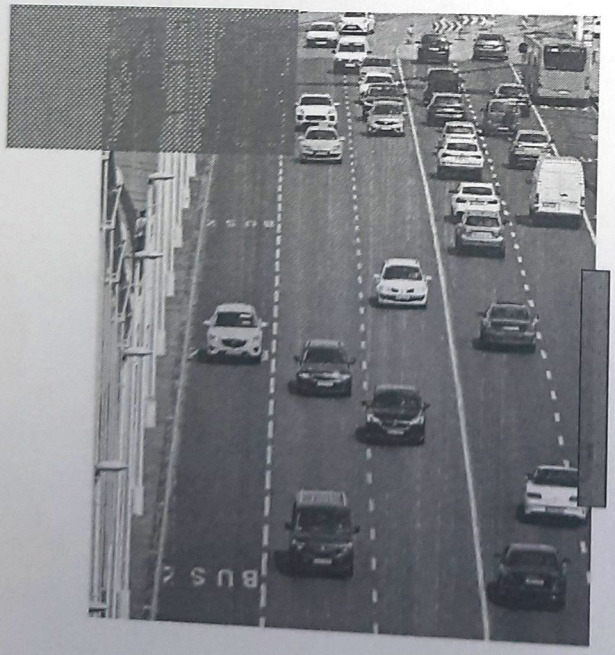
PROJECT CONTEST ON "EMBEDDED IOT WITH NODE MCU AND RASPBERRY PICO"

TOPIC: Prevention of Road Accidents By Using Node MCU and IOT platforms.



NAME & ROLL NO : A. EBBY ALLAN RAJ (22UEC057),
C. DHANUSHDEVA (22UEC023),
M. ARUN KUMAR (22UEC055)

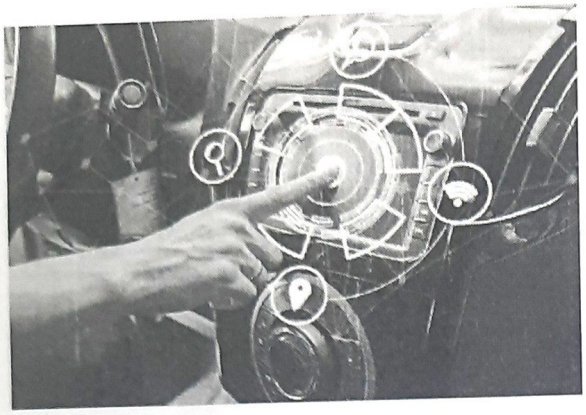
DEPARTMENT: II-ECE



OUTLINE

- INTRODUCTION
- PROBLEM STATEMENT
- NEED OF COMPONENTS AND SOFTWARE
- CONSTRUCTION AND WORKING
- APPLICATION
- SUMMARY
- REFERENCE
- ACKNOWLEDGEMENT

INTRODUCTION

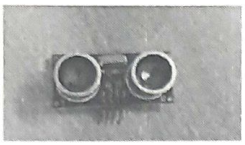
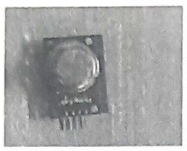


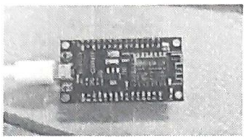
- Detecting alcohol consumption and vehicle presence are paramount.
- Accident prevention by swiftly identifying intoxicated drivers and monitoring road traffic.
- With this innovative integration, new era of proactive safety measures.
- Reducing the risk of accidents caused by impaired driving and reckless behavior.

PROBLEM STATEMENT

- Major problem occurs in the world wide, road accidents because of impaired driving and reckless behavior.
- Develop a compact and efficient system utilizing nodemcu and iot technology.
- Create a real-time monitoring solution to detect alcohol levels in drivers and identify vehicles, providing timely alerts to prevent accidents and enhance road safety.

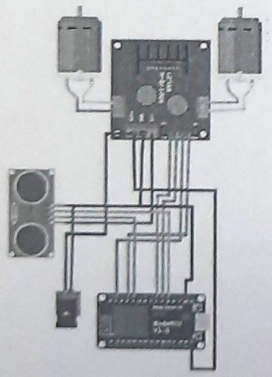
NEED OF COMPONENTS AND SOFTWARE

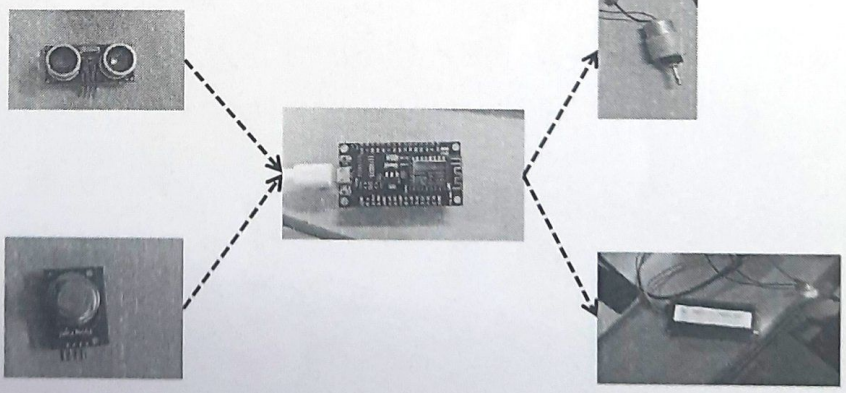



- COMPONENTS
  - ULTRA SONIC SENSOR
  - GAS SENSOR
  - DRIVE MOTOR
  - NODE MCU
  - LCD DISPLAY
- SOFTWARE
  - ARDUINO IDE
  - TELEGRAM

CIRCUIT / BLOCK DIAGRAM

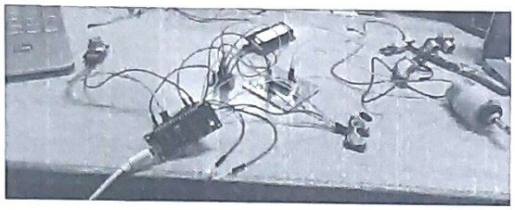


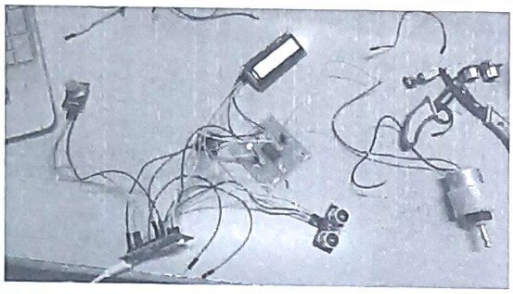
Circuit diagram



Block diagram

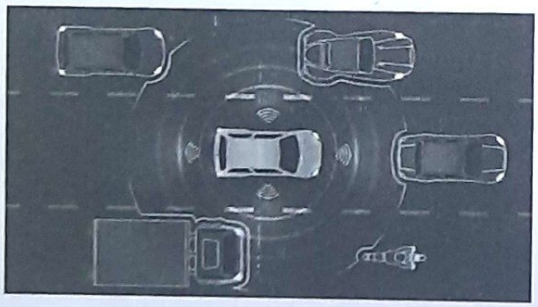
CONSTRUCTION AND WORKING





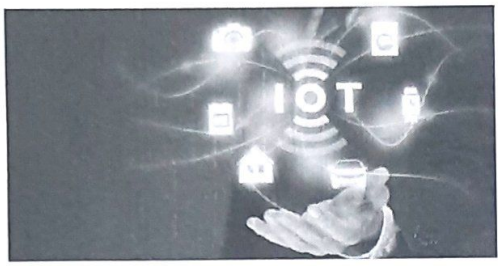
- Mini-project focused on "Prevention of Road Accidents By Using Node MCU and IOT platforms."
- Aimed to prevent accidents caused by drunk driving or in front of moving vehicles.
- Code written in Arduino IDE utilizing Ultra Sonic and Gas sensors, along with a drive motor.
- Module detects vehicles and alcohol consumption by the driver; activates if conditions met.
- Bot Chat created to deliver alert messages via Arduino IDE.
- If conditions satisfied, vehicle engine is turned off, and alert message is sent to Bot Chat.
- Module successfully built and operated as intended.

APPLICATION



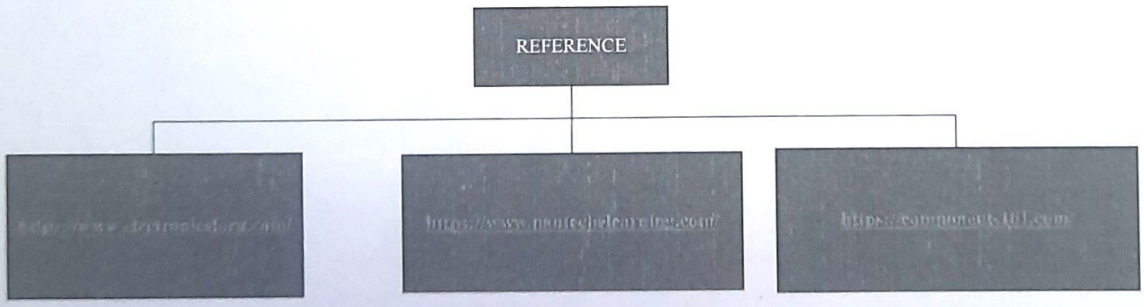
- **Drunk Driving Prevention**
- **Collision Avoidance**
- **Driver Behavior Monitoring**
- **Traffic Management**
- **Emergency Response**
- **Fleet Management**
- **Public Transportation Safety**
- **Data-driven Policy Making**

SUMMARY



- Node MCU and IoT platforms are utilized for preventing road accidents.
- System detects alcohol consumption in drivers, preventing drunk driving.
- Sensors detect vehicles and issue alerts or apply brakes to avoid collisions.
- Monitors driver behavior for intervention and education.
- Provides real-time road condition data for optimized traffic flow.
- Automatically alerts emergency services in case of accidents.
- Enhances fleet and public transportation safety.
- Aids in data-driven policy making for improved road safety measures.

REFERENCE



Alert today..,
alive tomorrow..,

THANK YOU

IOT Based Raindrop sensor using Raspberry Pi and Node MCU

A Value-Added Course Project Report

Submitted by

E.Jerlace selin (Reg No : 920422106025)
S.Viveka (Reg No : 920422106058)

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

KAMARAJ COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution Affiliated to Anna University, Chennai)

K.Vellakulam - 625 701 (Near Virudhunagar)

FUBRUARY 2024

BONAFIDE CERTIFICATE

Certified that this project entitled **"IOT Based Raindrop sensor using Raspberry Pi"** is the bonafide record of **Value Added Course on "Embedded IoT with Node MCU and Raspberry Pico"** from 12.02.2024 to 17.12.2024 done by **E.Jerlace selin (Reg. No. 920422106025) & S.Viveka(Reg. No.920422106058)** who carried out the work under my supervision.

SIGNATURE

Dr. R. Suresh Babu, M.E., MBA., Ph.D.,

(Head of the Department)

Professor & Head

Department of Electronics and Communication Engineering

Kamaraj College of Engineering and Technology, K. Vellakulam

Near Virdhunagar– 625701

SIGNATURE

Dr.N.M.Mary Sindhuja,M.E.,PhD

Mrs.P.Muthumari, M.E.,

(Course In-charges)

Associate Professor &Assistant Professor

Department of Electronics and Communication Engineering

Kamaraj College of Engineering and Technology, K. Vellakulam

Near Virdhunagar– 625701

Submitted for the Project presentation held at Kamaraj College of Engineering & Technology, Virudhunagar 625701 on 25.03.2024.

Committee Member 1 Committee Member 2 Committee Member 3

CONTENT

CHAPTER 1

ABSTRACT

The rapid advancements in raindrop sensors integrated with internet of things (IoT) technology have significantly improved rainfall monitoring capabilities. These sensors now offer enhanced sensitivity, durability, and real-time data transmission, revolutionizing the field of environmental monitoring. The integration of IoT enables seamless connectivity, allowing for comprehensive and timely insights into rainfall patterns and intensities, thereby contributing to more accurate weather forecasting and water resource management.

The primary objectives of IoT-enabled raindrop sensors include enhancing sensitivity for precise rainfall detection, ensuring durability under various environmental conditions, and facilitating real-time data collection and transmission. These sensors aim to provide reliable and actionable insights into rainfall patterns, contributing to improved weather forecasting, flood prediction, and water resource management. Additionally, cost-effectiveness and energy efficiency are key objectives to enable widespread deployment and scalability of these advanced monitoring systems.

Key features of IoT-based raindrop sensors include high sensitivity for accurate rainfall measurement, self-cleaning mechanisms to prevent obstructions, and wireless connectivity for seamless data transmission. These sensors are designed with low power consumption and compact form factors, making them suitable for remote and autonomous applications. Advanced algorithms and machine learning capabilities further enhance the sensor's performance, enabling predictive analytics and early warning systems for extreme weather events, thereby revolutionizing environmental monitoring and management.

Preliminary tests of IoT-based raindrop sensors have demonstrated promising advancements in real-time rainfall monitoring. Leveraging the connectivity and data transmission capabilities of IoT, these sensors offer enhanced accuracy and efficiency in capturing rainfall patterns. The integration of advanced algorithms facilitates predictive analytics and timely alerts for extreme weather conditions. This study provides insights into the design, functionality, and initial testing of iot-enabled raindrop sensors, highlighting their potential to revolutionize environmental monitoring and contribute to more effective weather forecasting and disaster preparedness.

CHAPTER 2

INTRODUCTION

The IoT-based raindrop sensor represents a pivotal advancement in environmental monitoring technology. Leveraging the power of the Internet of Things (IoT), this sensor offers real-time data collection and analysis of precipitation levels. By seamlessly integrating with connected devices and cloud platforms, it provides valuable insights into rainfall patterns, facilitating timely decision-making for agricultural, urban planning, and disaster management applications. This innovative sensor not only enhances accuracy and efficiency but also plays a crucial role in creating smarter and more resilient infrastructures for a sustainable future.

Evolution of IoT-Based Raindrop Sensor:

The evolution of raindrop sensors has seen a significant shift towards IoT integration, marking a departure from traditional monitoring methods. This integration has enabled seamless connectivity, enhanced accuracy, and broader applications, making the sensors more adaptable to modern environmental monitoring needs.

Understanding IoT-Based Raindrop Sensor:

An IoT-based raindrop sensor combines traditional rain detection mechanisms with IoT technology, allowing for continuous monitoring and remote data access. These sensors utilize various detection techniques to measure rainfall intensity and patterns, while IoT connectivity enables data transmission to centralized systems for real-time analysis.

Purpose and Objectives:

primary purpose of IoT-based raindrop sensors is to provide accurate and timely information on rainfall intensity, duration, and patterns. The objectives include improving weather forecasting accuracy, aiding in flood prediction, and supporting water resource management by delivering reliable data for informed decision-making.

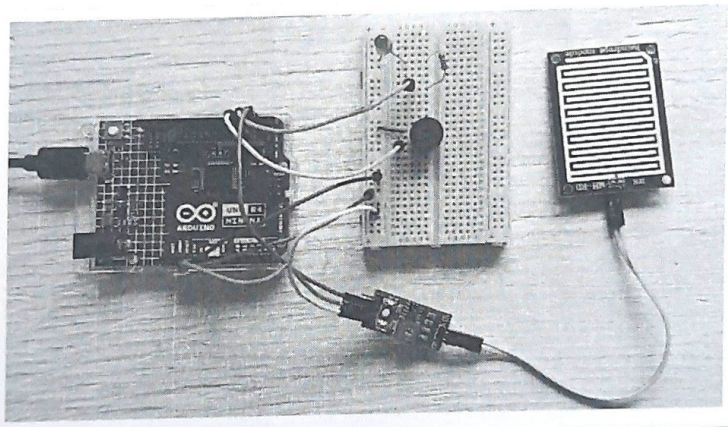
Key Components and Functionality :

Key components of an IoT-based raindrop sensor typically include rain detection elements, microcontrollers, wireless communication modules, and power management systems. The rain detection elements capture rainfall data, which is processed and transmitted by the microcontroller via wireless connectivity. The sensor's functionality is further enhanced by advanced algorithms and software, enabling predictive analytics and adaptive monitoring capabilities.

CHAPTER 3

DESIGN METHODOLOGY

A raindrop sensor is a device designed to detect the presence and intensity of rainfall. Utilizing various sensing techniques, such as capacitive or conductive methods, these sensors can accurately measure the volume of raindrops and provide real-time data on rainfall patterns. Commonly used in weather monitoring systems, agricultural applications, and smart irrigation systems, raindrop sensors play a crucial role in environmental sensing and data collection. By integrating these sensors with IoT platforms, users can remotely monitor rainfall conditions, optimize water management strategies, and receive timely alerts for potential flooding or irrigation needs, enhancing both efficiency and sustainability.



The raindrop sensor operates on the principle of detecting moisture through its conductive tracks. When raindrops fall on the sensor's surface, it causes a change in the resistance between its tracks. This change is measured and converted into an electrical signal proportional to the amount of rainfall. In usage, the sensor is typically interfaced with a microcontroller like Arduino or Raspberry Pi. The microcontroller reads the sensor's output signal, processes the data, and displays it or sends it to a cloud server for further analysis. The procedure involves calibrating the sensor, setting threshold values, and implementing algorithms to interpret the sensor data accurately for real-time monitoring or alerting.

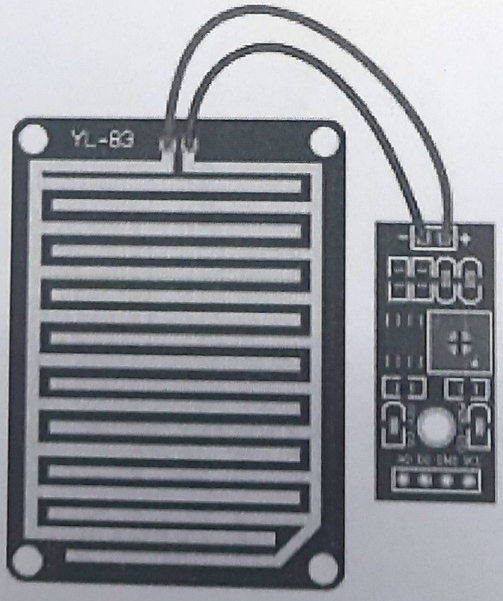
3.1 Components Required:

S.No	Component Name	Description	Quantity
1.	Raindrop Sensor with USB	Rain sensor module with USB interface	1
2.	Raspberry Pi Pico	Microcontroller board for data processing	1
3.	USB Cable	USB-A to Micro USB cable for connectivity	1
4.	Breadboard	Prototyping board for circuit connections	1
5.	Jumper Wires	Wires for connecting components	As needed
6.	Resistors	To interface the sensor with Raspberry Pi	As needed
7.	LEDs	Optional for status indication	As needed

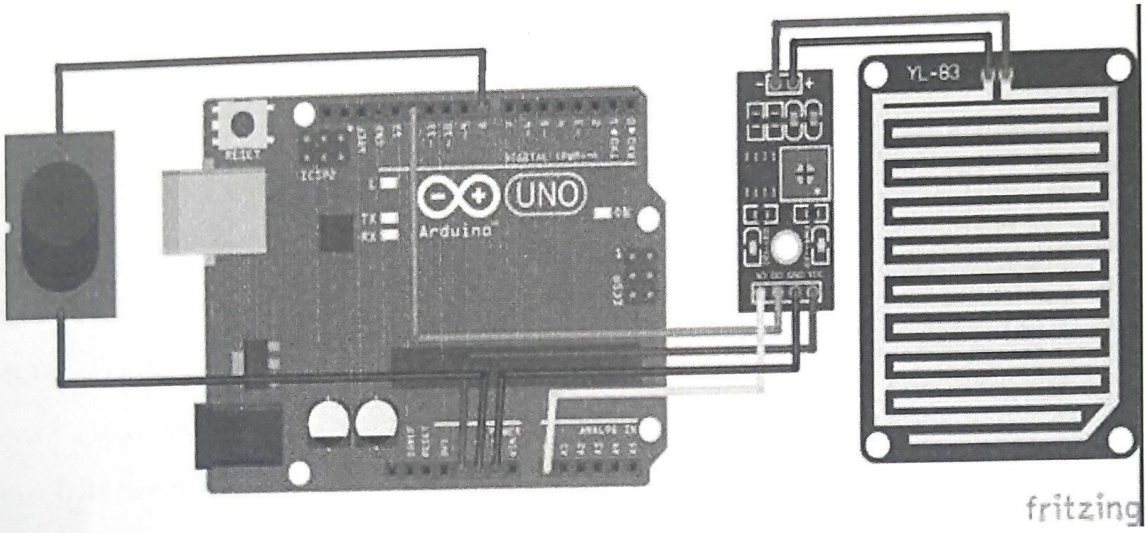
3.2 Hardware Design:

The hardware design for a raindrop sensor typically comprises several key components to ensure accurate and reliable detection of rainfall. At its core, the raindrop sensor module consists of a conductive surface and a control circuit. The conductive surface, usually made of copper or another conductive material, acts as a sensor to detect the presence of raindrops. When raindrops fall on the surface, they cause a change in the conductivity, which is measured by the control circuit.

In addition to the sensor module, the hardware setup includes a microcontroller, such as Raspberry Pi Pico, to interface with the raindrop sensor and process the collected data. The microcontroller reads the sensor's output, converts it into a digital signal, and sends it for further analysis or storage. To power the system, a stable power supply is essential, often provided by a battery or an external power source. Furthermore, to ensure proper interfacing and communication between the microcontroller and the sensor, supporting components like resistors, capacitors, and possibly an analog-to-digital converter (ADC) may be required. Proper shielding and housing may also be considered to protect the sensor from environmental factors and ensure long-term durability.



3.3 Circuit Diagram:



3.4 Software:

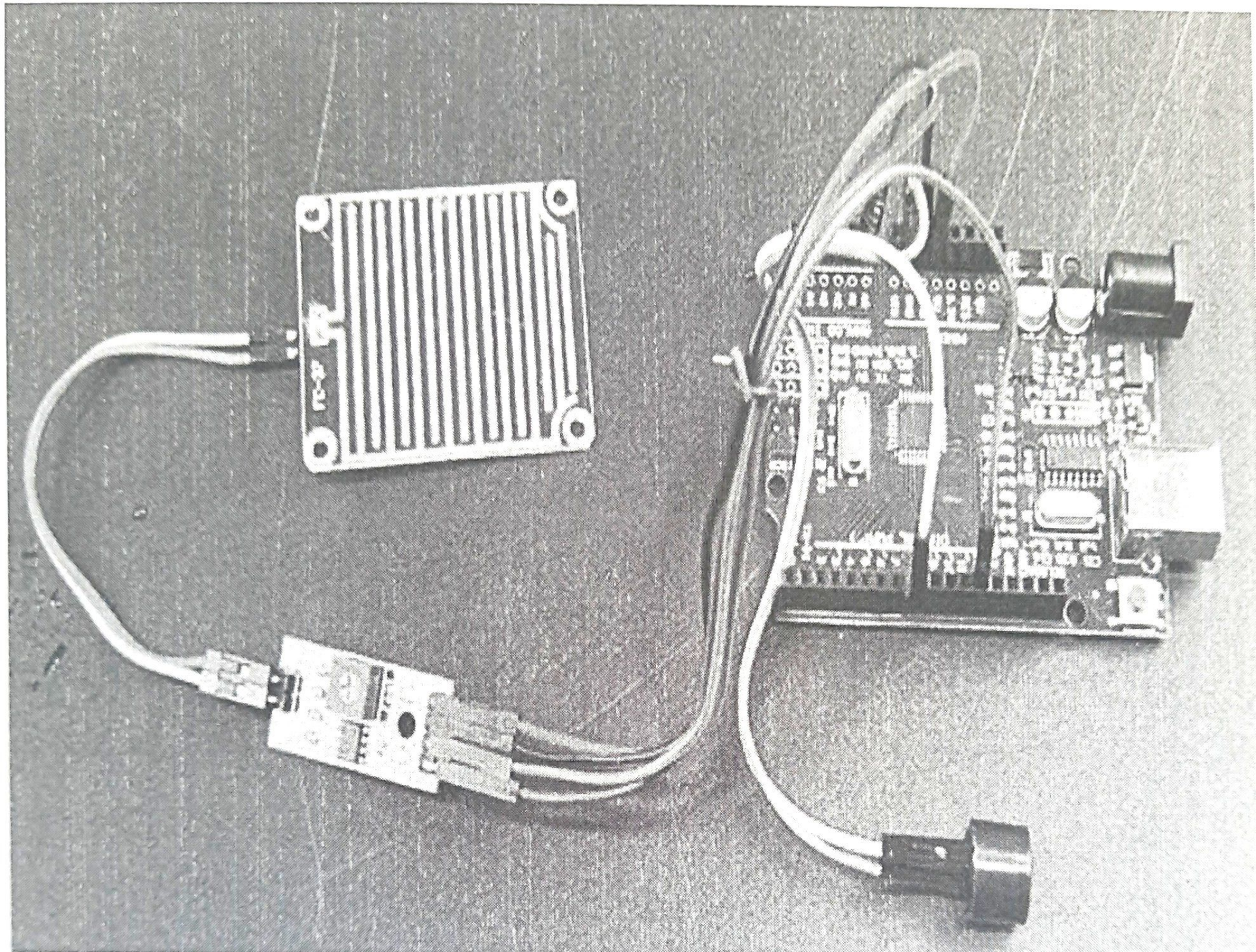
The software design for a raindrop sensor system typically involves several key components. At the core, there should be a data acquisition module responsible for reading the sensor's analog or digital output. This module interfaces with the Raspberry Pi Pico's GPIO pins to capture and process the rainfall data. A data logging component stores the collected data in a structured format, facilitating historical analysis and trend identification. An IoT communication module enables remote access to the sensor data, allowing for real-time monitoring and alerting via cloud-based platforms or mobile applications. Additionally, a user interface module provides a dashboard for data visualization, displaying rainfall metrics in an easily understandable format for users.

CHAPTER 4

RESULTS AND DISCUSSION

RESULTS AND DISCUSSION:

The raindrop sensor system successfully detected and measured rainfall intensity over a specified period. Data acquisition using Raspberry Pi Pico's GPIO pins provided accurate readings, capturing both light drizzles and heavy rainfall events. The collected data was logged and stored systematically, enabling historical analysis and trend identification. Remote monitoring via IoT connectivity allowed for real-time access to the rainfall data, while timely alerts were generated during significant weather conditions. The performance of the raindrop sensor system demonstrated its reliability and effectiveness in monitoring and measuring rainfall. The integration of Raspberry Pi Pico with the sensor facilitated seamless data acquisition and processing, leveraging the microcontroller's capabilities for optimal sensor interfacing. The IoT connectivity enhanced the system's versatility, enabling remote monitoring and alerting features that are crucial for various applications like agriculture, urban planning, and disaster management. Future enhancements could focus on improving energy efficiency, expanding sensor capabilities, and enhancing data visualization for better user engagement and understanding. Overall, the raindrop sensor system proved to be a valuable tool for accurate and real-time rainfall monitoring, with potential for broader applications and developments in the field of IoT-based environmental sensing.



CHAPTER 5

CONCLUSION

In conclusion, integrating raindrop sensors with IoT platforms offers significant advantages for various applications, ranging from smart agriculture to urban flood monitoring. These sensors provide real-time data on precipitation levels, enabling timely decision-making and automated responses. By leveraging the connectivity and computational capabilities of IoT devices like Arduino, Raspberry Pi, and ESP8266/ESP32, raindrop sensors can transmit data to centralized systems or cloud platforms for analysis and visualization.

The seamless integration of raindrop sensors with IoT technology facilitates the development of smart and responsive systems that can optimize water management, enhance agricultural productivity, and mitigate the risks associated with flooding and waterlogging. Moreover, the availability of open-source libraries, online tutorials, and community support simplifies the implementation process, making it accessible for both hobbyists and professionals.

However, it is crucial to consider factors such as sensor accuracy, calibration, and power consumption when designing IoT-based raindrop sensing systems. Proper calibration and maintenance are essential to ensure the reliability and accuracy of the data collected. Overall, IoT-based raindrop sensors represent a promising solution for addressing water-related challenges in various sectors, paving the way for smarter and more sustainable environments.

REFERENCES

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3. Sun Liqiang, Hao Jianhua, Zhang Xianlong, Li Dali and Liu Li, "Application of Internet of Things Technology in Intelligent Transportation [J]", *Informationization in China*, no. 09, pp. 87-88, 2020.

4. Zou Meiqiang, "Application of Internet of Things Technology in Intelligent Transportation System [J]", *Transpoworld*, no. 26, pp. 20-21, 2020.

ANNEURE 1 (Program)

Raindrop sensor program code

```
const int mqPin = A0;   // Analog pin for sensor
const int DO_Pin=12;
const int buzzerPin = 8; // Digital pin for buzzer
void setup() {
   pinMode(buzzerPin, OUTPUT);
   pinMode(DO_Pin, INPUT); // Configure D8 pin as a digital input pin
   Serial.begin(9600);
}
void loop() {
   int sensorValue = analogRead(mqPin);
   int threshold= digitalRead(DO_Pin);
   Serial.print("threshold_value: ");
   Serial.print(threshold);                    //prints the threshold_value reached as either
LOW or HIGH (above or underneath)
   Serial.print(", ");
   Serial.print("Sensor Value: ");
   Serial.println(sensorValue);
   delay(100);
   // Adjust the threshold value based on your sensor's characteristics
    if (threshold==LOW) {
```

```
        digitalWrite(buzzerPin, HIGH); // Turn on the buzzer
        delay(200); // Buzzer on time
        digitalWrite(buzzerPin, LOW);  // Turn off the buzzer
    }
    //delay(1000); // Wait before the next reading
}
```

Feedback-"Value Added Course on Embedded IoT with Node MCU and Raspberry Pico"

32	03:25	Active
Responses	Average time to complete	Status

1. Name of the student (0 point)

32
Responses

Latest Responses
"S.Jenisha"
"Dhanushdeva.C"
"Tejaswi.R"

3 respondents (**9%**) answered **kumar** for this question.

PVarsha Devi EBBY S C Venkataharish KMS DHESIKA J Rithika
V Shrutika rkishor Kumar
Ejerlace selin M Sankar **kumar** M b Ameer ajmal ATCHAYA
S M Arun kumar R Reshma
SSANTHOSH KUMAR Imran SDharun vaishnav KARTHIKA
ALLAN

2. Roll number (Give full digits like 22UEC001) (0 point)

32
Responses

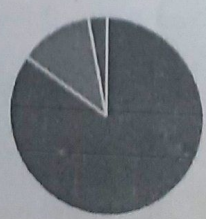
Latest Responses
"22uec052"
"22uec040"
"22UEC045"

2 respondents (**6%**) answered **22uec040** for this question.

22UEC024 22uec004
22uec039 22uec063 22UEC057 22UEC041 22UEC053
22UEC022 22uec012 **22uec040** 22uec035 22uec031
22UEC014 22uec051 22UEC013 22UEC055 22UEC006
22uec028 22UEC026 22uec021

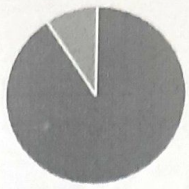
3. The session were well organized (0 point)

Strongly Agree	27
Agree	4
Neutral	1
Disagree	0
Strongly disagree	0



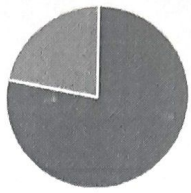
4. The contents in the session were presented in a clear and organized manner (0 point)

Strongly Agree	29
Agree	3
Neutral	0
Disagree	0
Strongly disagree	0



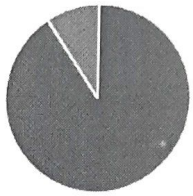
5. The trainer responded to questions in an informative, appropriate and satisfactory manner. (0 point)

Strongly Agree	25
Agree	7
Neutral	0
Disagree	0
Strongly disagree	0



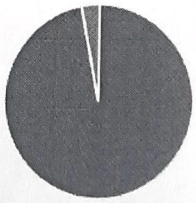
6. The trainer demonstrated a profound understanding of the course subject (0 point)

Strongly Agree	29
Agree	3
Neutral	0
Disagree	0
Strongly disagree	0



7. Whether the Resource Person encouraged the interaction? (0 point)

Yes	31
No	1



8. What is the most valuable aspect of this session in your opinion? (0 point)

32
Responses

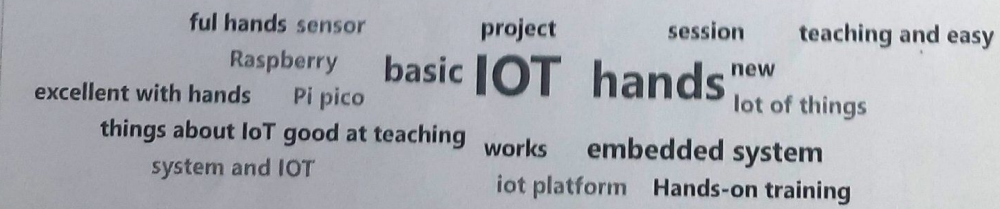
Latest Responses

"I learnt about embedded system and IOT in depth,we built many project "

"I know about all sensors"

"Gained knowledge as well as Hands on training simultaneously."

8 respondents (**25%**) answered **IOT** for this question.



9. Other comments (0 point)

32
Responses

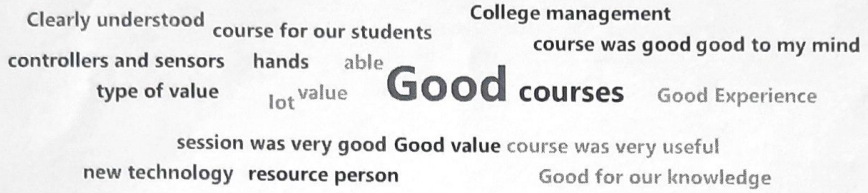
Latest Responses

"The value added course is very useful."

"And I learn the iot platform"

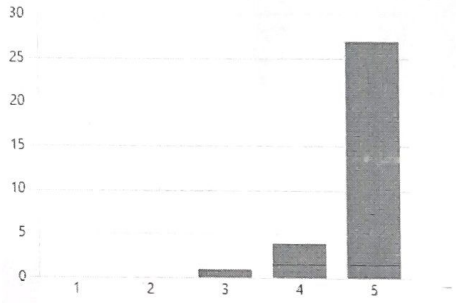
"The course was very useful. We were able to develop a project all by ourselv..."

14 respondents (**44%**) answered **Good** for this question.



10. Overall Rating of the " Value Added Course on Embedded IoT with Node MCU and Raspberry Pico" (0 point)

4.81
Average Rating



Course Incharges

HoD/ECE 22/4/24

Review: Feedback-"Value Added Course on Embedded IoT with Node MCU and Raspberry Pico"

Respondent

S MEYYALAGAN.M

02:54
Time to complete

1. Name of the student * Score / 0 pts

Meyyalagan.M

2. Roll number (Give full digits like 22UEC001) * Score / 0 pts

22uec063

3. The session were well organized * Score / 0 pts

- Strongly Agree
- (•) Agree
- Neutral
- Disagree
- Strongly disagree

4. The contents in the session were presented in a clear and organized manner * Score / 0 pts

- Strongly Agree
- (•) Agree
- Neutral
- Disagree
- Strongly disagree

5. The trainer responded to questions in an informative, appropriate and satisfactory manner. * Score / 0 pts

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly disagree

6. The trainer demonstrated a profound understanding of the course subject * Score / 0 pts

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly disagree

7. Whether the Resource Person encouraged the interaction? * Score / 0 pts

- Yes
- No

8. What is the most valuable aspect of this session in your opinion? * Score / 0 pts

We have done pratically was nice

9. Other comments * Score / 0 pts

Nice

10. Overall Rating of the " Value Added Course on Embedded IoT with Node MCU and Raspberry Pico" * Score / 0 pts

★ ★ ★ ★ ★

Course Incharges

HOD | ECE

Review: Feedback-"Value Added Course on Embedded IoT with Node MCU and Raspberry Pico"

Respondent

9 VIVEKA.S

03:48
Time to complete

1. Name of the student * Score / 0 pts

S.VIVEKA

2. Roll number (Give full digits like 22UEC001) * Score / 0 pts

22UEC041

3. The session were well organized * Score / 0 pts

- (●) Strongly Agree
- ( ) Agree
- ( ) Neutral
- ( ) Disagree
- ( ) Strongly disagree

4. The contents in the session were presented in a clear and organized manner * Score / 0 pts

- (●) Strongly Agree
- ( ) Agree
- ( ) Neutral
- ( ) Disagree
- ( ) Strongly disagree

5. The trainer responded to questions in an informative, appropriate and satisfactory manner. * Score / 0 pts

- (●) Strongly Agree
- ( ) Agree
- ( ) Neutral
- ( ) Disagree
- ( ) Strongly disagree

6. The trainer demonstrated a profound understanding of the course subject * Score / 0 pts

- (●) Strongly Agree
- ( ) Agree
- ( ) Neutral
- ( ) Disagree
- ( ) Strongly disagree

7. Whether the Resource Person encouraged the interaction? * Score / 0 pts

- (●) Yes
- ( ) No

8. What is the most valuable aspect of this session in your opinion? * Score / 0 pts

Learnt the basics of embedded system and IOT by theoretical and practical

9. Other comments * Score / 0 pts

Course is easily understandable

10. Overall Rating of the " Value Added Course on Embedded IoT with Node MCU and Raspberry Pico" * Score / 0 pts

★ ★ ★ ★ ★

Course Incharges

HOD | ECE

27/4/24

Review: Feedback-"Value Added Course on Embedded IoT with Node MCU and Raspberry Pico"

Respondent

1 DHARUN VAISHNAV.S

02:15
Time to complete

1. Name of the student * Score / 0 pts

S.Dharun vaishnav

2. Roll number (Give full digits like 22UEC001) * Score / 0 pts

22uec035

3. The session were well organized * Score / 0 pts

- (●) Strongly Agree
- ( ) Agree
- ( ) Neutral
- ( ) Disagree
- ( ) Strongly disagree

4. The contents in the session were presented in a clear and organized manner * Score / 0 pts

- (●) Strongly Agree
- ( ) Agree
- ( ) Neutral
- ( ) Disagree
- ( ) Strongly disagree

5. The trainer responded to questions in an informative, appropriate and satisfactory manner. * Score / 0 pts

- (●) Strongly Agree
- ( ) Agree
- ( ) Neutral
- ( ) Disagree
- ( ) Strongly disagree

6. The trainer demonstrated a profound understanding of the course subject * Score / 0 pts

- (●) Strongly Agree
- ( ) Agree
- ( ) Neutral
- ( ) Disagree
- ( ) Strongly disagree

7. Whether the Resource Person encouraged the interaction? * Score / 0 pts

- (●) Yes
- ( ) No

8. What is the most valuable aspect of this session in your opinion? * Score / 0 pts

Learnt about Arduino board

9. Other comments * Score / 0 pts

Very great teaching

10. Overall Rating of the " Value Added Course on Embedded IoT with Node MCU and Raspberry Pico" * Score / 0 pts

★ ★ ★ ★ ★

Course Incharges

HOD/ECE

KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VALUE ADDED COURSE ON

EMBEDDED IOT WITH NODE MCU AND RASPBERRY PICO

VIDEO LINK

Course Date: 12/2/2024 to 17/2/2024 **Class:** II ECE

Venue: VLSI Lab

https://kcetvnrorg-my.sharepoint.com/personal/muthumariece_kamarajengg_edu_in/_layouts/15/onedrive.aspx?id=%2Fpersonal%2Fmuthumariece%5Fkamarajengg%5Fedu%5Fin%2FDocuments%2FVAC%2DIoT%2DPPT&ct=1714190506552&or=OWA%2DNT%2DMail&cid=71be4b39%2Dda3f%2Da302%2Ddd45%2Da202126d3a86&ga=1

P. Mti
Course In charges

22/4/24
HoD /ECE

KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution - Affiliated to Anna University, Chennai)
S.P.G. Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K. Vellakulam - 625 701, (Near Virudhunagar), Madurai District.

Submitted to the SECRETARY for approval through the PRINCIPAL

Book No. ECE Date 19/01/2024

SL.No. 35

Approval may please be granted for conducting Value Added Course for II year ECE students for the strength of 33 students in "six days Value Added Course on Embedded IoT with Node MCU and Raspberry PICO", by Pantech e Learning, chennai. The date of value Added Course from 5/2/2024 to 10/2/2024. Kindly request you to ~~to 17/02/2024~~ Changed to 12/02/2024 for the resource Persons during Provide hospitality

The Program.

Registration Amount Per student - Rs. 2000/-
(including GST)
Total Amount (for 33 students) - Rs. 66,000/-

Enclosed :- Quotation cum syllabus copy.

P. Nuthumari 19/1/24
Signature of Faculty
[P. MUTHUMARI]

HOD 20/1/24

PRINCIPAL 22/1/24

OFFICE USE

Value added Courses
Last Year Rate Rs. 1,750/- per student.

1) Account Head
2) Budget allotted
3) Amount committed / Spent sofar
4) Balance available

OM

Treasurer

Secretary

KAMARAJ®
COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

Department of Electronics and Communication Engineering

Value Added Course on

"Embedded IoT with Node MCU and Raspberry PICO" and

"Full Stack Development"

12.02.2024 to 17.02.2024

Time: 9.30 AM **Venue: EDUSAT Hall**

AGENDA

Prayer Song	:	**Mr.R.U.Swetha** *III year ECE Student* *Kamaraj College of Engineering and Technology*
Welcome Address	:	**Dr.N.M.Mary Sindhuja** *Associate Professor / ECE* *Kamaraj College of Engineering and Technology*
Inaugural Address	:	**Dr.R.Sureshbabu, M.E., M.B.A., Ph.D.,** *Dean Academics* *Professor & Head / ECE* *Kamaraj College of Engineering and Technology*
Felicitation	:	**Mr.V.K.Dharmarajan,B.B.A., F.C.A.,** *Secretary* *Kamaraj College of Engineering and Technology* **Dr.S.Senthil, M.E., Ph.D.,** *Principal* *Kamaraj College of Engineering and Technology*

WARM WELCOME!