R22 Regulation *Subject code:4P5BA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Regular/Supplementary Examinations, November 2025

IOT APPLICATIONS IN ELECTRICAL ENGINEERING

(EEE)

Maximum Marks: 60 Date: 22.11.2025 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BloomTx
1.a)	Define a Sensor	1M	1	1
b)	What is the gauge factor of a strain gauge.	1M	1	1
c)	What is a Photoresistor?	1M	2	1
d)	Mention the applications of piezoelectric cables	1M	2	1
e)	What is electrostatic actuation in MEMS?	1M	3	1
f)	Give Example of MEMS based Sensors	1M	3	1
g)	Mention any two IoT applications at generation level.	1M	4	2
h)	What is meant by interoperability	1M	4	1
i)	What is the motivation behind IoE?	1M	5	2
j)	Define energy internet	1M	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BloomTx
2	a) Explain Classification of Sensors based on operating principle b) Compare and contrast RTD and thermistor Sensors.	5M 5M	1	2,3
	OR			
3	a) Evaluate the effect of environmental conditions such as temperature, humidity, and vibration on the accuracy and lifetime of different industrial sensors b) Write short notes on Strain Gauge and its Applications	5M 5M	1	5,3
4	a) Explain the operation of motion detection sensors used in IoT systems b) Discuss the working principles of velocity and acceleration sensors, focusing on capacitive, piezoresistive, and piezoelectric types	5M 5M	2	2,4
	OR			
5	a)Compare potentiometric and capacitive position sensors b) Explain how velocity and acceleration sensors function, including	5M	2	4,5

	capacitive, piezoresistive, and piezoelectric types. Include a discussion on their integration in robotics and industrial systems.	5M		
6	a) Discuss the basic concepts of MEMS design, including beam and diaphragm mechanics. Explain their role in the development of pressure and touch sensors. b) Write a short note on electric and magnetic field sensors.	5M 5M	3	4,2
	OR			
7	a) Explain fabrication and actuation principles in MEMS b) Discuss the working principle and applications of RF MEMS switches. Explain their role in wireless communication systems and their advantages over traditional switches.	5M 5M	3	3,5
8	a) Explain the architecture and layers of IoT in Smart Grid b) Explain the driving factors for the integration of IoT in smart grids. Discuss its role at the generation, transmission, and distribution levels.	5M 5M	4	2,4
	OR			
9	a) Describe the role of IoT in smart homes, focusing on energy management, monitoring, and control systems. b) Discuss the benefits of IoT in enhancing the efficiency and reliability of smart grids.	5M 5M	4	3,5
10	a) Describe IoE Architecture and its integration with smart gird. b) Explain how IoE integrates renewable energy sources with smart grid	5M 5M	5	3,4
	OR			
11	a) Discuss the evolution and vision of IoE concept b) Describe how the energy internet functions as a smart grid, highlighting applications in distributed generation, energy routing, and consumer-level management.	5M 5M	5	2,5