



R22 Regulation **Subject code:4P5BA**
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Regular Examinations, December 2024

**IOT APPLICATIONS IN ELECTRICAL ENGINEERING
(EEE)**

Maximum Marks: 60

Date:31.12.2024

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		CO	Bloom Tx
All the following questions carry equal marks (10X1M=10 Marks)			
1.a)	Define a resistance temperature detector (RTD)	1	Remember
b)	What is the primary principle of piezoelectric sensors?	1	Understand
c)	Define a capacitive occupancy sensor and state one of its applications.	2	Remember
d)	Explain the basic working principle of a piezoelectric cable used in flow sensing.	2	Understand
e)	Define MEMS	3	Remember
f)	What is the primary principle behind electrostatic actuation in MEMS devices?	3	Understand
g)	Define the term "standardization" in the context of smart grid systems.	4	Remember
h)	List two examples of metering and monitoring applications in smart homes.	4	Remember
i)	Define the Internet of Energy (IoE).	5	Remember
j)	State one key difference between the Energy Internet and a traditional Smart Grid.	5	Understand
Part-B			
Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
2	Classify temperature sensors and explain the working principle of thermoresistive sensors such as RTDs and silicon resistive thermistors. Illustrate with diagrams. [10M]	1	Analysis
	OR		
3	Evaluate piezoresistive and capacitive pressure sensors in terms of their principles, construction, and applications. Include examples to support your explanation. [10M]	1	Evaluate
4	Analyze the working principles and applications of capacitive and inductive sensors for displacement measurement. [10M]	2	Analysis
	OR		
5	Evaluate the performance of resistive microphones for sound detection in harsh environments. [10M]	2	Evaluate
6	Explain the mechanical behavior of beams and diaphragms in MEMS devices. Derive the expressions for stress and deflection in a cantilever beam subjected to a uniform load. [10M]	3	Apply

	OR		
7	Evaluate a process flow for the fabrication of a MEMS-based pressure sensor. Include key fabrication techniques, materials, and process challenges. [10M]	3	Evaluate
8	Explain the driving factors for implementing smart grid systems at the generation, transmission, and distribution levels. [10M]	4	Understand
	OR		
9	Evaluate the challenges and benefits of achieving standardization and interoperability in smart home applications. Suggest measures to overcome the challenges. [10M]	4	Evaluate
10	Discuss the architecture of the Internet of Energy (IoE) with a focus on its key components and their roles. [10M]	5	Apply
	OR		
11	Evaluate the motivations behind the development of IoE and how its vision addresses energy routines, information sensing, and processing issues. [10M]	5	Evaluate