R22 Regulation *Subject code:4P5BA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, April 2026

IOT APPLICATIONS IN ELECTRICAL ENGINEERING

(EEE)

Maximum Marks: 60 Date:20.04.2026 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	BTL
1.a)	Compare Active and passive Sensor	1M	1	2
b)	Define Piezoelectric Effect	1M	1	1
c)	What is an Inductive Sensor	1M	2	1
d)	What is the principle of capacitive proximity sensors	1M	2	2
e)	Define MEMS	1M	3	1
f)	What are RF MEMS switches?	1M	3	2
g)	Define Smart Grid.	1M	4	1
h)	What is the importance of IoT in smart grid applications?	1M	4	2
i)	Define Internet of Energy	1M	5	1
j)	What are energy routines?	1M	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Explain different types of temperature sensors with examples. b) Describe the construction and working of strain gauge sensors	5M 5M	1	2
	OR			
3	a) Derive and explain the working principles of piezoelectric sensors and justify their use in vibration monitoring for smart grid applications b) Explain capacitive and Piezoelectric pressure sensors	5M 5M	1	3,5
4	a) Explain the working principle of magnetic velocity and acceleration sensors. b) Describe the construction and operating principle of potentiometric, capacitive, inductive, and magnetic position and displacement sensors.	5M 5M	2	2,3
	OR			

5	a) Explain the principle and applications of electromagnetic and acoustic flow sensors. Discuss their advantages and limitations in various industrial applications. b) Discuss the construction and working of flow sensors.	5M 5M	2	2,4
6	a) Explain the principle of electrostatic actuation in MEMS devices. Discuss its advantages, limitations, and applications in micro-systems. b) Write short notes on MEMS pressure and Touch Sensors.	5M 5M	3	2,3
	OR			
7	a) Describe Beam/Diaphragm mechanics in MEMS sensors. b) Explain the construction and operating principle of MEMS-based electric and magnetic field sensors. Discuss their advantages and applications in IoT-based systems.	5M 5M	3	2,4
8	a) Discuss the applications of IoT in metering and monitoring within smart grids. Explain how IoT enhances efficiency and reliability in energy distribution. b) Explain the challenges related to standardization and interoperability in IoT-enabled smart grid systems.	5M 5M	4	3,5
	OR			
9	a) Explain the role of IoT in demand response and load management in smart grids. b) Describe the role of IoT in the transmission level of smart grids.	5M 5M	4	2,3
10	a) Discuss the concept of the Internet of Energy (IoE). Discuss its vision, motivation, and how it differs from conventional smart grid concepts. b) Write short notes on challenges and future scope of IoE	5M 5M	5	2,5
	OR			
11	a) Explain the information sensing and processing challenges in IoE. Discuss issues related to real-time energy monitoring and control. b) Describe the impact of IoE on energy consumers and producers.	5M 5M	5	3,5