Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 31-05-2025 **Time:** 09:30 am – 12:30 pm

School: SOE	**Program:** B. Tech-ECE	
Course Code: ECE3023	**Course Name:** Wireless Sensor Networks & IoT	
Semester: VI	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	24	24	26	26	NA

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Identify two areas of application for wireless sensor networks.	**2 Marks**	**L1**	**CO1**
2.	Briefly elucidate the distinction between Wireless Sensor Networks (WSN) and ad-hoc networks.	**2 Marks**	**L1**	**CO1**
3.	Give a brief explanation of the benefits of the frequency reuse concept in cellular networks.	**2 Marks**	**L2**	**CO2**
4.	Illustrate the configuration of the Wireless Sensor Network (WSN) bus topology and briefly describe its functionality.	**2 Marks**	**L2**	**CO2**
5.	Explain the concept of cyber-physical system is in the context of the Internet of Things.	**2 Marks**	**L2**	**CO3**
6.	What constitutes a sensor within an IoT system?	**2 Marks**	**L2**	**CO3**
7.	Give a brief explanation of the IoT traffic flow LEACH routing protocol.	**2 Marks**	**L2**	**CO3**
8.	Enumerate at least two distinctions between IIoT and IoT.	**2 Marks**	**L3**	**CO4**
9.	Examine the differences between IT and OT from an IIoT perspective.	**2 Marks**	**L3**	**CO4**
10.	Enumerate the benefits of industrial automation in contemporary factories and manufacturing facilities.	**2 Marks**	**L3**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Present an illustrated comparison between cellular and wireless ad-hoc networks, focusing on infrastructure, needed technologies, and applications.	**10 Marks**	**L1**	**CO1**
	b.	Elucidate the CSMA/CD protocol within a bus network, accompanied by an appropriate diagram and sequential processes.	**10 Marks**	**L1**	**CO1**
		Or			
12.	**a.**	Detail the constraints and obstacles faced in constructing a stable Wireless Sensor Network in an urban warfare context.	**10 Marks**	**L1**	**CO1**
	b.	Draw the architecture of a wireless sensor node using a clean block diagram, highlighting the ADC's requirements and potential uses.	**10 Marks**	**L1**	**CO1**

13.	**a.**	Examine, via appropriate mathematical formulations, the diverse protocols employed for routing in wireless ad-hoc networks.	**10 Marks**	**L2**	**CO2**
	b.	Describe the operation of the tree topology structure in a wireless sensor network using an appropriate diagram.	**10 Marks**	**L2**	**CO2**
		Or			
14.	**a.**	Illustrate the configuration of a mesh topology and examine the functionality of both full mesh and partial mesh arrangements. Provide two justifications, accompanied by explanations, for the predominance of mesh topology in Wireless Sensor Networks (WSNs).	**10 Marks**	**L2**	**CO2**
	b.	Describe the architecture of a star topology network using an appropriate diagram. Describe the differences between the bus and star topological structures used in WSN.	**10 Marks**	**L2**	**CO2**

15.	**a.**	What are the different types of sensors utilized in IoT technology? Provide a concise description and application of each item.	**10 Marks**	**L3**	**CO3**
	b.	Outline the overarching architectural prerequisites of IoT within the ITU framework.	**10 Marks**	**L3**	**CO3**
		Or			
16.	**a.**	In the context of Internet of Things applications, give a thorough comparison of sensors, transducers, and actuators.	**10 Marks**	**L3**	**CO3**
	b.	Elucidate the concept of Wireless Sensor Networks (WSN) within the Internet of Things (IoT), detailing diverse methodologies for building gateways between the internet and local networks.	**10 Marks**	**L3**	**CO3**

17.	**a.**	Provide a suitable graphic to demonstrate how cyber-physical systems are used in industrial Internet of things applications.	**10 Marks**	**L3**	**CO4**

	b.	What are interconnected factories? Briefly elucidate the impact of networked factories on future industries.	**10 Marks**	**L3**	**CO4**
		Or			
18.	**a.**	Elucidate the notion of future factories. What are the essential components required for the implementation of future factories?	**10 Marks**	**L3**	**CO4**
	b.	Provide a brief overview of the Industry 4.0 approaches that must be used for the IIoT.	**10 Marks**	**L3**	**CO4**