K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:V
Class:TY	Program:B.Tech
Branch Code:INT	Pattern:2023
Name of Course:Embedded Systems and Internet of Things	Course Code:2308381
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains __2___page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

		Marks	CO
Question No. 1			
1a)	Describe how the complete IoT system will sense, process, communicate, and actuate to maintain ideal plant conditions.	(6)	CO1
Question No. 2			
2a)	A smart city uses low-power air-quality sensors with IEEE 802.15.4 radios. Apply your understanding of **6LoWPAN and RPL** to show how the sensors send IPv6 data efficiently and maintain routing when some nodes fail.	(6)	CO2
Question No. 3			
3a)	Summarize the key challenges and design considerations in Wireless Multimedia Sensor Networks (WMSNs), including sensing, coverage, connectivity, and energy constraints.	(8)	CO3
	OR		
3b)	Detail the ways Wireless HART ensures reliable communication using TDMA, channel hopping, and mesh networking	(8)	CO3
3c)	How do Wireless Sensor Networks (WSNs) manage energy, handle node failures, and deal with data transmission challenges in real monitoring applications?	(8)	CO3
	OR		
3d)	Outline the main characteristics, advantages, and constraints of UAV networks, focusing on topology, mobility, reliability, and communication requirements.	(8)	CO3
Question No. 4			
4a)	Compare the challenges of IoT deployment in urban vs. rural settings with respect to network coverage, hardware cost, and maintenance.	(8)	CO4
	OR		
4b)	Discuss the importance of Python in IoT application development. Explain how its ease of coding, extensive libraries, compatibility with devices like Raspberry Pi, and strong community support make it widely used in IoT projects.	(8)	CO4

4c)	Describe the key features and hardware components of the Raspberry Pi and explain its common applications.	(8)	CO4

OR

4d)	Explain the need for interoperability in IoT with reference to device communication, data exchange, and system scalability.	(8)	CO4

Question No. 5

5a)	Explain the three major cloud computing service models: IaaS, PaaS, and SaaS. Describe the purpose of each with examples.	(8)	CO5

OR

5b)	Explain the architecture of SDN with its main components: Application Layer, Control Layer, and Infrastructure Layer.	(8)	CO5
5c)	Design and write a program to interface a DHT sensor with a microcontroller or Raspberry Pi to measure temperature and humidity.	(8)	CO5

OR

5d)	Explain the four major cloud deployment models: Public, Private, Hybrid, and Community Cloud.	(8)	CO5

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