Reg. No. : | | | | | | | | | | | | |

Question Paper Code: R5I02

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Fifth Semester

CSE (Internet of things)

R21UIO502–IOT COMMUNICATION PROTOCOLS

(Regulations R2021)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1.	Define the three primary layers of a typical IoT architecture.	CO1-U
2.	Given a smart agriculture deployment, identify which layer is responsible for data aggregation at the field gateway and explain why?	CO2-App
3.	What is the significance of network topology in the deployment view?	CO1-U
4.	Mention any two components of the functional view.	CO1-U
5.	What is the role of the master and slave in a Bluetooth piconet?	CO1-U
6.	Why does Bluetooth use frequency hopping?	CO1-U
7.	How 6LoWPAN can be used in a smart agriculture sensor network?	CO2-App
8.	What does 6LoWPAN stand for and what is its purpose in IoT?	CO1-U
9.	Why is UDP considered a connectionless protocol?	CO1-U
10.	Why is DCCP called a message-oriented transport protocol?	CO1-U

PART – B (5 x 16= 80 Marks)

11.	(a)	Design an IoT-based system for Smart Waste Management in urban areas using appropriate IoT technologies.	CO1-U	(16)
		Or		
	(b)	Explain the roles and characteristics of IoT end devices and gateways within an IoT communication architecture.	CO1-U	(16)

12.	(a)	Designing an IoT based smart street lighting system. Apply the Functional View concepts to this scenario.	CO2-App	(16)
		Or		
	(b)	Developing a multi sensor industrial monitoring system based on the standard five layers IoT Reference Model. Apply your understanding of technical design constraints at each layer to this scenario.	CO2-App	(16)
13.	(a)	Explain the working principle of Bluetooth technology, including frequency hopping and piconet formation.	CO1-U	(16)
		Or		
	(b)	Explain the architecture of Bluetooth Low Energy, including roles with the BLE protocol stack.	CO1-U	(16)
14.	(a)	Design a DHCP-based IP management system for a large corporate network with multiple subnets. Explain its working.	CO2-App	(16)
		Or		
	(b)	Explain how CORPL manages routing in dynamic spectrum environments.	CO2-App	(16)
15.	(a)	Justify the use of DCCP in multimedia streaming applications with suitable examples.	CO2-App	(16)
		Or		
	(b)	Design an XMPP-based group chat system for enterprise use. Show which XEPs t usoe and how server components and storage should be organized.	CO2-App	(16)