Sub Code: BECT- 504 (B) **ROLL NO……..……..**

ODD SEMESTER EXAMINATION, 2024 – 25

3rd Year (5th Sem) B.Tech.: Electronics & Communication Engineering

DATA COMMUNICATION & NETWORKING

Duration: 3:00 hrs **Max Marks: 100**

Note: - Attempt all questions. All Questions carry equal marks. In case of any ambiguity or missing data, the same may be assumed and state the assumption made in the answer.

Q 1.	Answer any two parts of the following.	(10x2= 20)
	(i)Why is a protocol necessary for data communication?	(5 marks)
	(ii) What is the significance of binary representation in data communication?	(5 marks)
	b) What are the advantages of a point-to-point configuration over a multipoint configuration?	(10 marks)
	c) What are the key differences between the OSI model and the TCP/IP model?	(10 marks)
Q 2	Answer any two parts of the following.	(10x2= 20)
	a) (i) What are the key differences between circuit switching, packet switching, and message switching?	(5 marks)
	(ii) How do the Presentation Layer and Application Layer interact in the OSI model?	(5 marks)
	b) What is the setup phase in circuit-switched networks, and why is it necessary?	(10 marks)
	c) How do switching techniques impact network efficiency and resource utilization?	(10 marks)
Q 3	Answer any two parts of the following.	(10x2= 20)
	a) (i) What are the different types of errors that can occur during data transmission?	(5 marks)
	(ii) How does the checksum technique differ from CRC and VRC in terms of error detection accuracy?	(5 marks)
	b) What impact does the network delay (propagation delay) have on the performance of Stop-and-Wait and Sliding Window ARQ protocols?	(10 marks)
	c) Describe the different types of framing techniques used in data link protocols.	(10 marks)
Q 4.	Answer any two parts of the following.	(10x2= 20)
	a) (i) Explain the significance of IEEE Project 802 in the development of LAN technologies.	(5 marks)
	(ii)Explain the key features of FDDI, including its dual-ring topology and its use of fiber optics?	(5 marks)
	b) What is X.25, and how does it work for wide-area packet-switched networks?	(10 marks)
	c) Explain the structure of a SONET frame and the concept of multiplexing in SONET.	(10 marks)
Q 5.	Answer any two parts of the following.	(10x2= 20)
	a) (i) What is a proxy server, and how does it facilitate network security and traffic management?	(5 marks)
	(ii) Explain the role of the Transmission Control Protocol (TCP) in ensuring reliable data transmission.	(5 marks)
	b) What is IP addressing, and how are IPv4 and IPv6 addresses structured?	(10 marks)
	c) What are the key differences between a Local Area Network (LAN) and a Wide Area Network (WAN) in terms of TCP/IP usage?	(10 marks)