Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 50022

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2025
Fifth Semester
Computer Science and Engineering
U23CS512 – DATA COMMUNICATION AND NETWORKS
(Common to IT)
(Regulation 2023)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Define throughput, latency, bandwidth and jitter.	2	K1	CO1
2.	Define simplex, half-duplex, full duplex transmission with example.	2	K1	CO1
3.	How is checksum different from Cyclic Redundancy Check (CRC)?	2	K2	CO2
4.	Differentiate between Carrier Sense Multiple Access with Collision Detection (CSMA/CD) and Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA).	2	K2	CO2
5.	How packet switching differ from circuit switching?	2	K2	CO3
6.	Differentiate between routing and forwarding.	2	K2	CO3
7.	Differentiate between process-to-process and host-to-host delivery.	2	K2	CO4
8.	In what scenarios would User Datagram Protocol (UDP) be preferred over Transmission Control Protocol (TCP)?	2	K2	CO4
9.	Why is Quality of Service (QoS) important in multimedia and real time applications?	2	K2	CO5
10.	In what situations would you use File Transfer Protocol (FTP) over Hyper Text transfer Protocol (HTTP)?	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Describe each layer of Open Systems Interconnection (OSI) model with its function and protocols.	13	K1	CO1
		(OR)			
	b)	Compare bus, star, ring and mesh topologies with advantages and disadvantages.	13	K2	CO1
12.	a)	Compare and Contrast Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA) and Code Division Multiple Access (CDMA).	13	K2	CO2
		(OR)			
	b)	How Stop-and-Wait protocols ensure flow control? How do ACK and NAK messages help in error control?	13	K2	CO2
13.	a)	Compare and contrast Distance – Vector Routing (DVR), Link – State Routing (LSR) and Path – Vector Routing algorithms.	13	K2	CO3
		(OR)			
	b)	Explain Open Shortest Path First (OSPF), Routing Information Protocol (RIP) and Border Gateway Protocol (BGP) in terms of scalability and convergence.	13	K1	CO3
14.	a)	Compare Stop-and-Wait Automatic Repeat Request (ARQ), Go-Back-N ARQ and Selective Repeat ARQ in terms of efficiency, complexity, use of buffers and bandwidth utilization.	13	K4	CO4
		(OR)			
	b)	Explain three way handshake in TCP connection establishment with a diagram.	13	K2	CO4
15.	a)	Explain the process of sending and receiving an email with Simple Mail Transfer Protocol (SMTP) and Post Office Protocol (POP3)/ Internet Message Access Protocol (IMAP).	13	K1	CO5
		(OR)			
	b)	Describe the Domain name System (DNS) resolution process when a user enters a URL in a browser.	13	K2	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	A university campus network supports thousands of students using Wi-Fi and wired LANs. Recently, students have complained about slow speeds and dropped video calls during online classes. How would you test bandwidth, latency, and jitter across the campus? How can you use QoS to prioritize online classes over regular downloads?	(9+6= 15)	K3	CO5
		(OR)			
	b)	Your ISP currently uses IPv4 but is planning to migrate to IPv6 due to IP exhaustion. The ISP needs a seamless migration strategy to support both IPv4 and IPv6 clients during the transition. How will DNS and routing protocols need to adapt? What security and configuration challenges may arise during migration?	(8+7= 15)	K2	CO3