K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)
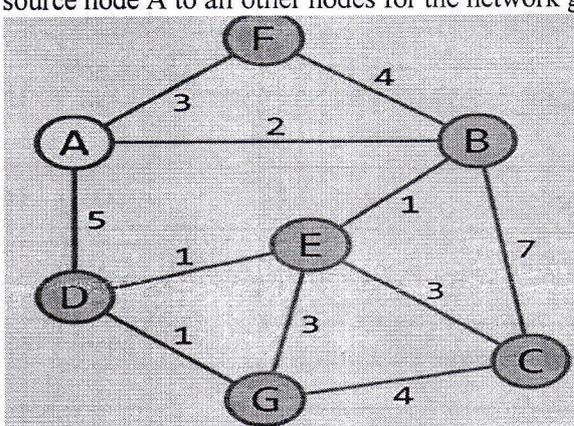
Jan ~~Nov Dec~~ 2026

Supplementary Exam (B. Tech) Program: AIDS Scheme III

Regular Examination: TY Semester: V   Course Code: AIDLC5041 and Course Name: AI in Computer Networks

Date of Exam: 02/02/2026,   Duration: 02.5 Hours   Max. Marks: 60

Instructions:
(1) All questions are compulsory.
(2) Draw neat diagrams wherever applicable.
(3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	What are the functions of layers in the OSI model?		CO1	Un
b)	What types of communication media are commonly used in LANs? Explain any two.		CO2	Un
c)	What is CSMA/CD? Why is it used in wired Ethernet?		CO3	Un
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	Compare circuit switching, packet switching, and message switching.		CO2	Un
b)	Write a short note on networking devices like switches and routers.		CO2	Un
c)	Explain how AI can optimize routing decisions.		CO6	Un
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	You are given the following network speeds and distances: • 1 Gbps within a building • 500 Mbps up to 40 km • 100 Mbps across different states Classify each as LAN, MAN, or WAN and justify your classification using technical definitions.		CO1	Un
b)	Compare TCP and UDP. TCP opens a connection using an initial sequence number (ISN) of 14,534. The other party opens the connection with an ISN of 21,732. Show the three TCP segments during the connection establishment.		CO5	Ap

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c)	A sender uses CRC with generator polynomial $x^3 + 1$. If the data word is **11100110**, a) Compute the CRC and form the transmitted code word. b) Explain how the receiver identifies an error when the **last bit** of the received frame is corrupted.		CO3	Ap
Q.4	**Solve any two questions out of three. (10 marks each)**	20		
a)	Using Dijkstra's shortest path algorithm, compute the shortest paths from a source node A to all other nodes for the network graph provided. 		CO4	Ap
b)	A sender transmits frames of **600 bytes** over a link with: • Bandwidth = **5 Mbps** • One-way propagation delay = **12 ms** Calculate: a) Transmission time b) Round Trip Time (RTT) c) Maximum link utilization using **Stop-and-Wait** protocol		CO5	Ap
c)	Differentiate between IPv4 and IPv6 addressing schemes . Determine the class and network address for the following IP addresses by using default mask, 1. 84.42.58.11 2. 195.38.14.13 3. 144.62.12.9		CO4	Ap

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