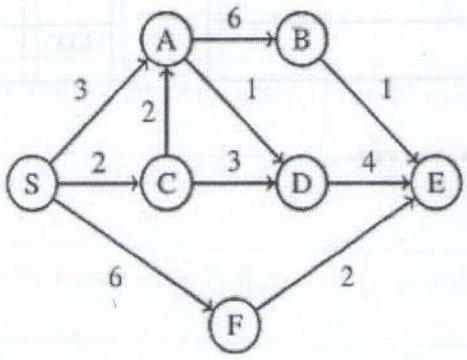
K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec 2024-25 AI - DS
(B. Tech / M. Tech.) Program: B.Tech. Scheme I/II/IIB/III: IIB & II
Regular/Supplementary Examination: TY Semester: V
Course Code: AIDLC5051 and Course Name: Computer Networks
Date of Exam: 2/12/2024 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)	Coaxial cable much less susceptible to interference and crosstalk than twisted pair, Why?		CO2	U
b)	Describe the steps involved in the TCP three-way handshake process.		CO5	U
c)	Compare HTTP and SMTP.		CO6	U
Q 2	**Solve any two questions out of three: (05 marks each)**	10		
a)	Explain Different types of network addresses.		CO4	U
b)	What is piggybacking? Give an example of a piggybacked frame.		CO3	U
c)	What are the functions of layers in the OSI model?		CO1	U
Q.3	**Solve any two questions out of three. (10 marks each).**	20		
a)	What is the main concept behind Dijkstra's Algorithm? In the given example find the shortest path using Dijkstra's Algorithm from source node S. 		CO4	Ap

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b)	An ISP is given a block of addresses beginning with **192.168.0.0/16**. The ISP needs to distribute these addresses to 3 groups of customers as follows: a) **Group 1** has **32 customers**, and each needs **512 addresses**. b) **Group 2** has **64 customers**, and each needs **256 addresses**. c) **Group 3** has **128 customers**, and each needs **128 addresses**. Design the sub-blocks and give the slash notation for each sub-block. How many addresses are still available after these allocations?		CO4	Ap
c)	What is a Cyclic Redundancy Check (CRC), and why is it used in data communication? A message that is to be transmitted is represented by the polynomial $M(x) = x^5 + x^4 + x$ with a generating prime polynomial $G(x) = x^3 + x^2 + 1$. Generate a 3 bit CRC code, $C(x)$ which is to be appended to $M(x)$.		CO3	Ap
Q.4	**Solve any two questions out of three. (10 marks each)**	20		
a)	Compare the TCP header and the UDP header. List the fields in the TCP header that are not part of the UDP header. Give the reason for each missing field ?		CO5	U
b)	Explain the following network connecting devices- i) Switch ii) Router iii) Gateway iv) Bridge v) Hub		CO2	U
c)	Discuss the working of CSMA/CD protocol.		CO3	U

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