

R V College of Engineering

R V Vidyanikethan Post
Mysuru Road Bengaluru - 560 059

IV Semester B.E regular / supplementary examinations June/July- 2025
Common to CS/CD/CY/IS/AIML
Course : Computer Networks-CY245AT

Time : 3 Hours

Maximum Marks : 100

Instructions to the students

- Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
- Answer FIVE full questions from Part B. In Part B question number 2 is compulsory. Answer any one full question from 3 and 4, 5 and 6, 7 and 8, and 9 and 10.

Part A

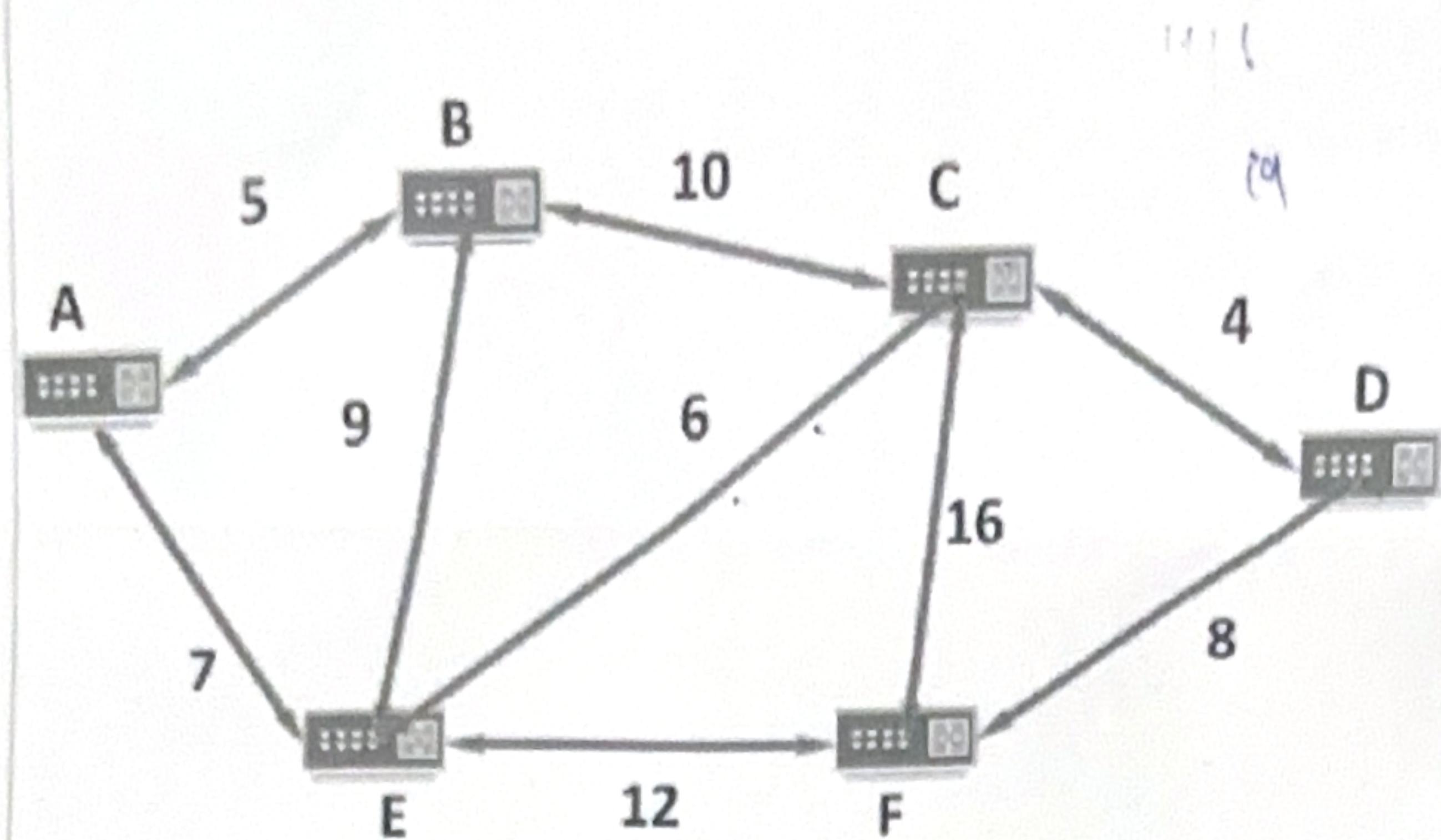
Question No	Question	M	CO	BT
1.1	Give one difference between connection-oriented and connectionless services.	02	2	1
1.2	What are the three main frame types in HDLC?	02	1	1
1.3	What is DAG? Give Example.	02	2	3
1.4	What is Reverse Path Forwarding ? Give an example tree.	02	2	3
1.5	"Flow control relates to the point-to-point traffic between a given sender and a given receiver; congestion control is a global issue". Justify this statement.	02	2	2
1.6	Mention any two limitations of Integrated services.	02	2	2
1.7	What is BGP and its role in internetwork routing?	02	2	2
1.8	If the total transmitted data is 80 bytes and only 50 bytes is application data, what percentage is overhead due to headers?	02	2	3
1.9	How Time Stamping is useful in RTP Protocol.	02	2	2
1.10	Illustrate Request-Response Model.	02	1	2

Part B

Question No	Question	M	CO	BT
2a	A bank is setting up ATMs across a city and needs a secure network to connect them to the central database. Suggest the appropriate network type and transmission method. How will security and reliability be ensured?	08	2	3
2b	Explain the working of CSMA/CA with a diagram. How does it detect and handle collisions in wireless networks?	08	2	2
3a	For the given Network diagram, apply Dijkstra's algorithm and answer the following questions (All are bidirectional arrows) i. Draw the shortest path tree to all nodes from the source node A after applying the algorithm	08	1	3

ii. Write the shortest path from A to D and A to C, along with the cost.

iii. What is the drawback of Dijkstra's algorithm?



done 3b

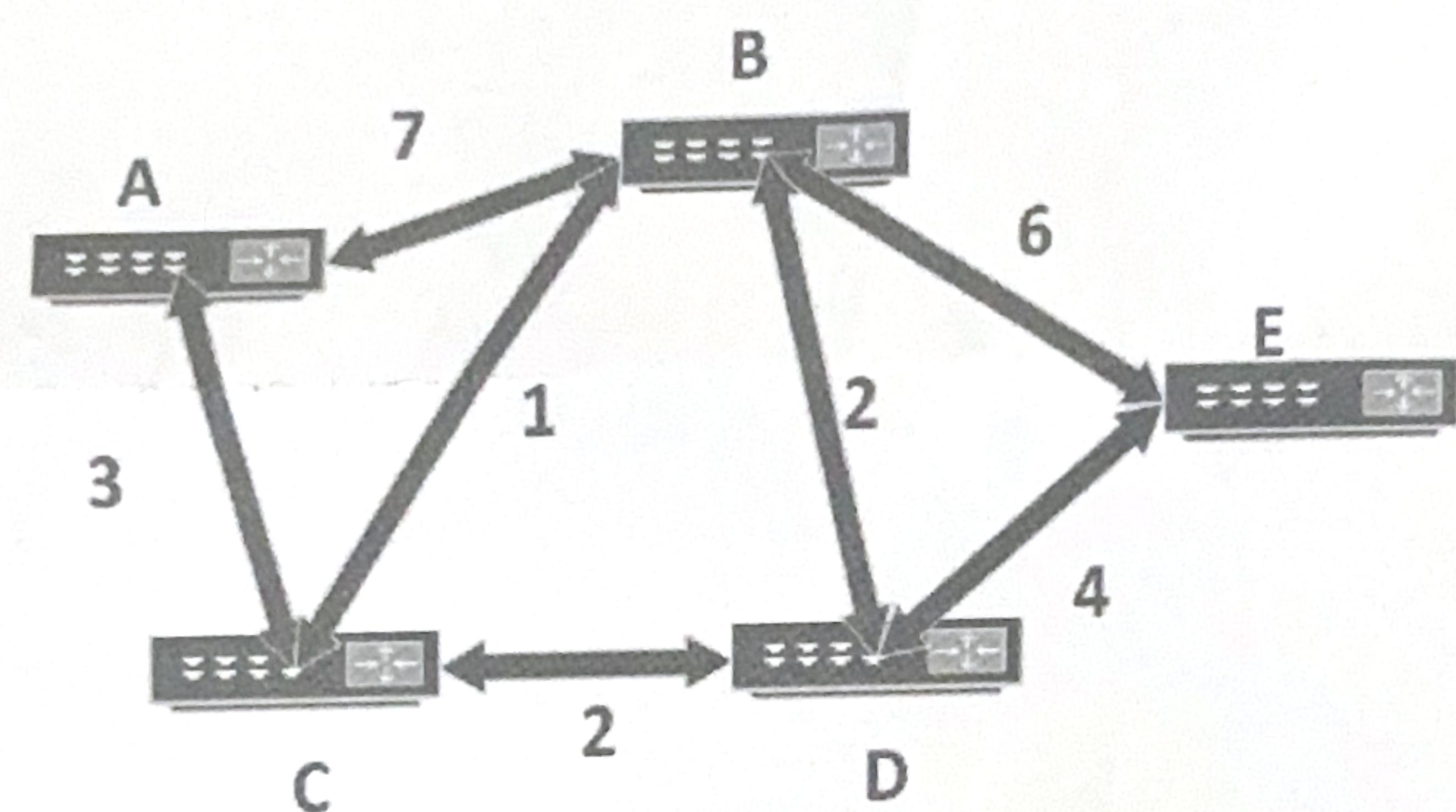
Differentiate Virtual circuit subnet and Datagram subnet.

08 2 1

OR

Apply Link State Routing (LSR) to the below diagram and show all the steps. Also find the shortest path from source A to all routers as part of the LSR. (All are bidirectional arrows)

4a



08 1 3

4b

Explain Routing within datagram network. Show the routing table entries with an example.

08 2 2

Assume a virtual-circuit network where each new connection reserves 20 Mbps of bandwidth. The total available bandwidth on a link is 200 Mbps. Each connection lasts 10 seconds.

06 2 3

done 5a

(a) How many connections can be supported simultaneously without causing congestion?

(b) If 12 connections are admitted, what is the risk, and how can it be prevented?

04 2 2

5b
5c

Discuss open loop solutions and closed loop solutions with respect to congestion control.

06 2 3

Explain any four benefits and limitations of Integrated Service

6a

Discuss the impact of congestion on network performance. Discuss the symptoms of congestion and general strategies can be employed to detect and control congestion effectively? Provide real-world scenarios where congestion control is critical.

10 3 3

OR

6b	Describe the significance of admission control policies in congestion prevention. How do different admission control schemes impact resource utilization and user satisfaction in a virtual-circuit network?	06	3	4
7a	With a neat sketch explain Address Resolution Protocol.	08	2	2
7b	Explain how Border Gateway Protocol (BGP) manages routing between Autonomous Systems (ASes), using the concepts of transit, customer, and peering relationships.	08	2	5
OR				
8a	Compare and contrast interior and exterior routing protocols with examples.	04	4	2
8b	Discuss the advantages and disadvantages of fragmentation. Should networks avoid it when possible? Recommend solution strategy. Justify your answer.	06	3	4
8c	List the advantages and disadvantages of IPv6.	06	1	2
9a	During a voice call over an app like WhatsApp, you notice a brief glitch in the audio, but the call continues without interruption. Which transport protocol is most likely to be used for this communication, and why is it preferred in such real-time applications (Characteristics)?	08	2	3
9b	A user opens a web browser and enters the URL of an online bookstore. The browser sends a request to the server, which processes the request, accesses the required data, and sends back an HTML page displaying the list of books. The user then selects a book, and the details are retrieved and displayed without reloading the whole page. Based on this scenario, discuss the steps performed on both the client and server sides to complete this interaction.	08	2	3
OR				
10a	A file transfer application is sending data over a TCP connection. The sender is allowed to transmit multiple packets without waiting for individual acknowledgments, if the total amount of unacknowledged data does not exceed the receiver's advertised capacity. As the receiver sends acknowledgments, the sender gradually sends more data without restarting the process. Which TCP mechanism is being used to control this flow of data, and how does it help improve the efficiency of data transmission?	08	2	3
10b	During a live online concert stream, users can watch the performance in real-time with synchronized audio and video. Despite occasional minor delays or dropped frames, the stream continues smoothly without interruption. The media player does not wait for every packet to arrive before playback begins, and no retransmission of lost data occurs. A) Which protocol is most likely responsible for handling the delivery of this multimedia content, and why is it suitable for this type of real-time application? B) Also, provide the protocol stack for the same.	08	3	3