


National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	Computer Networks	Course Code:	CS 3001
	Program:	BS (Computer Science)	Semester:	Fall 2025
	Duration:	20 minutes	Total Marks:	15
	Paper Date:	13-November-2025	Section	5A, 5C
	Exam Type:	Quiz 5 - Chapter 5	Page(s):	2

Student Name

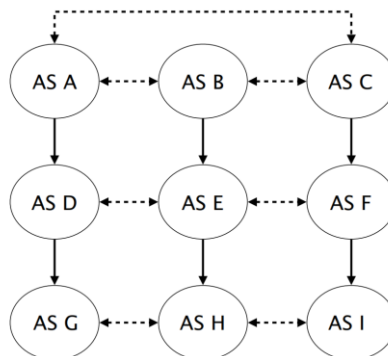
Roll No.

Section:

Q1. Carefully read the Question/Diagram before attempting: [5 marks] [CLO 3]

Consider the AS topology (that uses BGP) shown below. Single-headed plain arrows point from providers to their customers (AS-A is the provider of AS-D), while double-headed dashed arrows connect peers (AS-D and AS-E are peers) Recall the policies AS'es adopt when routing packets (also given in hints below). If there is a tie, assume that AS'es prefer paths with fewer hops. A few helpful hints/rules are as below:

- AS'es prefer customer routes since they are revenue-generating.
- Next in preference are peer routes, which are neutral cost.
- Least preferred are provider routes, as they incur cost.
- BGP prohibits AS'es from forwarding traffic between providers or peers if they are not customers.



1. What path does a packet from AS-F to AS-D take (must be in correct order)?

2. What path does a packet from AS-D to AS-B take (must be in correct order)?

Q2: Draw Diagram and give justification:

[2 Marks] [CLO 3]

In the left Figure, Consider the path information that reaches stub networks G, H and I.

Based on the information available at I. What is its view of Network Topology? Justify your

answer (justification in a few lines). Topological view from G is shown below in right figure:

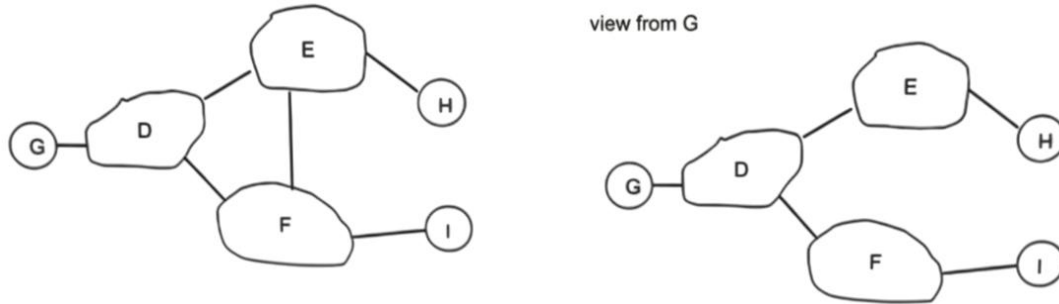
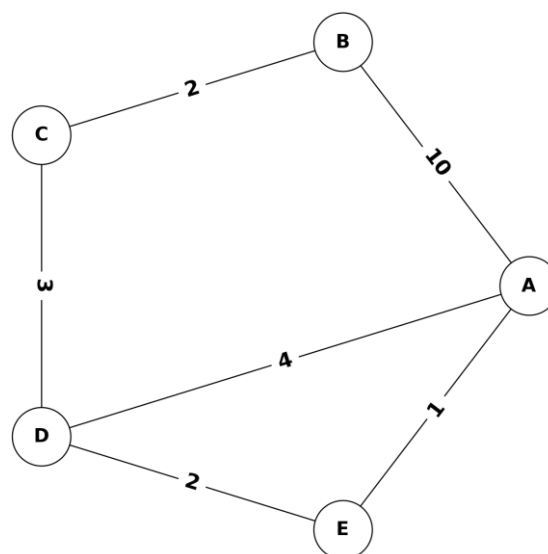


Diagram & Justification:

Q2: Distance-Vector routing Algorithm (Bellman Ford):

[7 + 1 Marks] [CLO 3]



Distance-Vector algorithm has to be performed starting with the initial table shown below, Entries in the table are in the form of **cost/next-hop** (you need to follow the same form). In

this problem node A receives vectors from node B, D and E. Fill in the tables below (the initial table has already been filled for your convenience).

Info at Node	Distance to reach Node (Initial Table)				
	A	B	C	D	E
A	—	10/B	∞	4/D	1/E
B	10/A	—	2/C	∞	∞
C	∞	2/B	—	3/D	∞
D	4/A	∞	3/C	—	2/E
E	1/A	∞	∞	2/D	—

Info at Node	Distance to reach Node (after 1 exchange)				
	A	B	C	D	E
A	—				
B		—			
C			—		
D				—	
E					—

Info at Node	Distance to reach Node (after 2 exchanges)				
	A	B	C	D	E
A	—				
B		—			
C			—		
D				—	
E					—

Forwarding table in B (initial)		
Destination	Cost	Next Hop
A		
C		
D		
E		

Forwarding table in B (1 exchange)		
Destination	Cost	Next Hop
A		
C		
D		
E		

Forwarding table in B (2 exchanges)		
Destination	Cost	Next Hop
A		
C		
D		
E		

Based on the above data, let's say that the algorithm stops after the 1st exchange (before completing a 2nd exchange). What is the path a packet takes when going from B to A (must be the exact path)? What is the total cost?

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(Note: Feel free to use rest of the space/extra space for Rough Work)