



# RAMA UNIVERSITY

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## FACULTY OF ENGINEERING & TECHNOLOGY

### DCS-503 Computer Networks

#### Lecture-21

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Assistant Professor

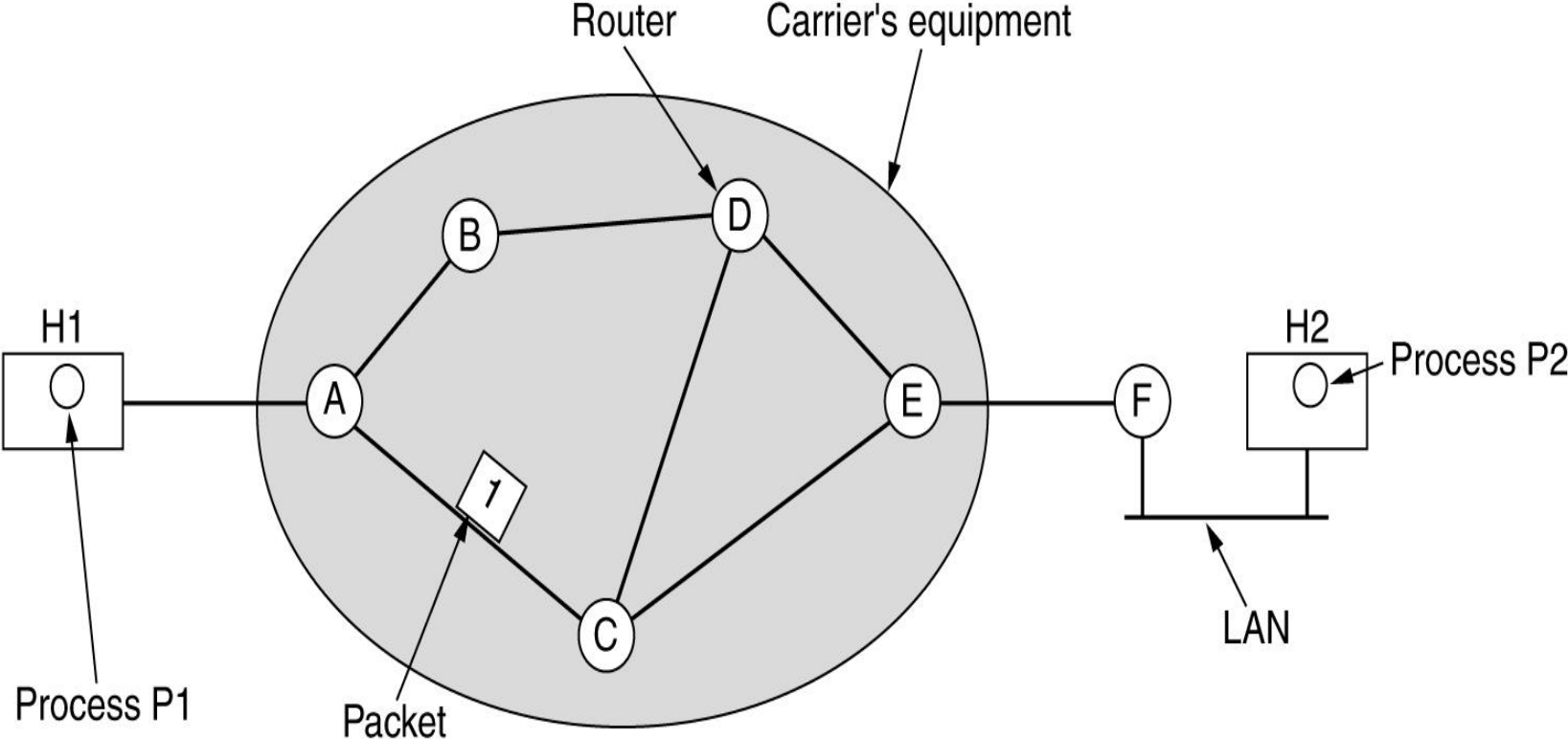
Computer Science & Engineering

# OUTLINE

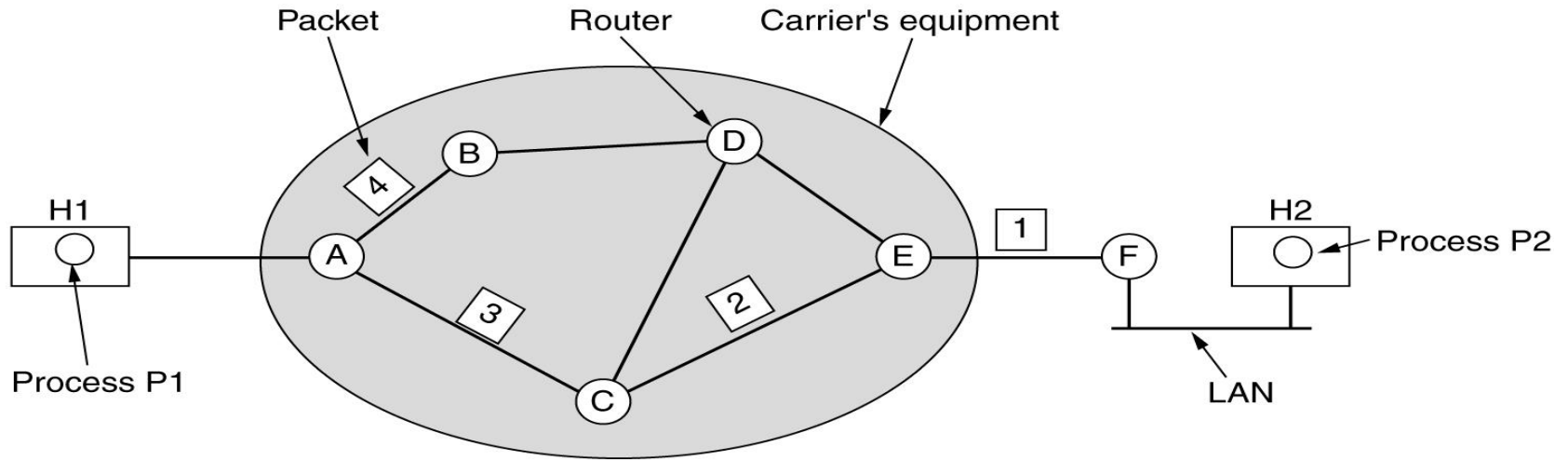
- **THE NETWORK LAYER PROBLEM PACKET SWITCHING**
- **THE NETWORK LAYER PROBLEM : CONNECTIONLESS SERVICE**
- **THE PROBLEM NETWORK LAYER : CONNECTION-ORIENTED SERVICE**
- **CONNECTIONLESS VS. CONNECTION-ORIENTED**
- **SHORTEST PATH ALGORITHM**



# THE NETWORK LAYER PROBLEM PACKET SWITCHING



# THE NETWORK LAYER PROBLEM : CONNECTIONLESS SERVICE



A's table

initially	later
A   -	A   -
B   B	B   B
C   C	C   C
D   B	D   B
E   C	E   B
F   C	F   B

C's table

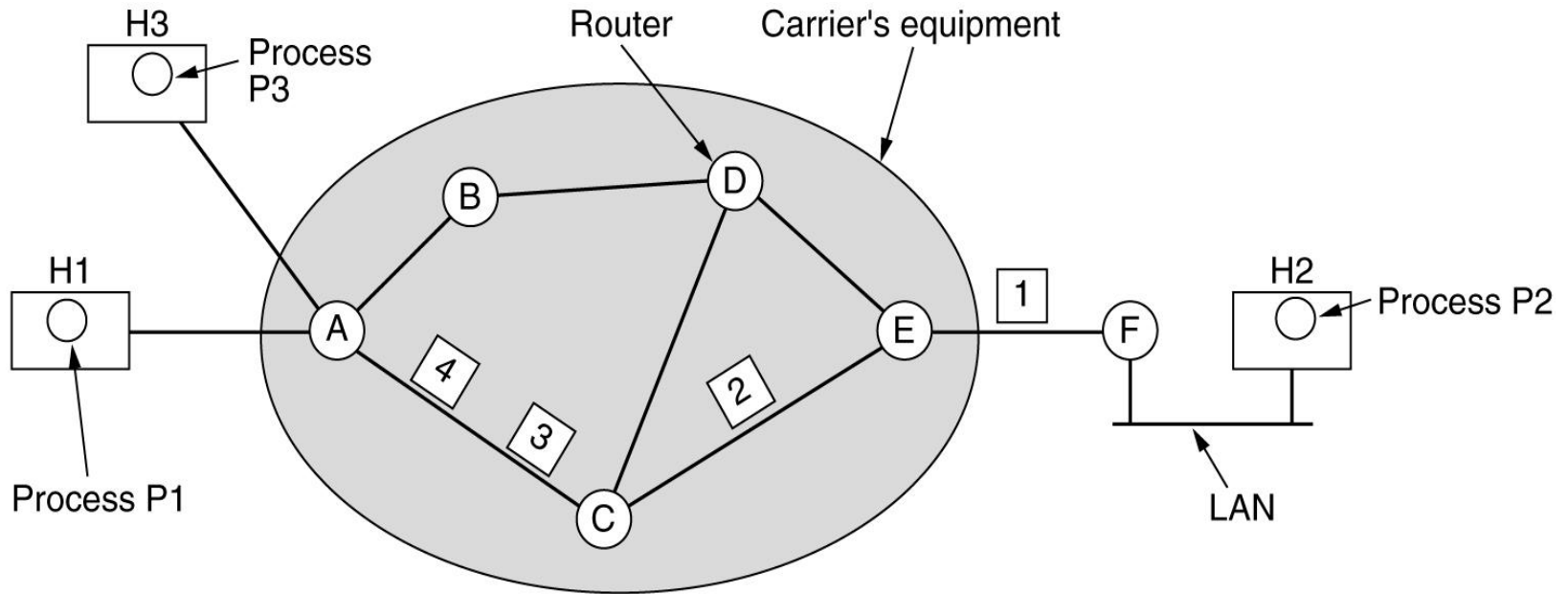
A   A
B   A
C   -
D   D
E   E
F   E

E's table

A   C
B   D
C   C
D   D
E   -
F   F

Dest. Line

# THE PROBLEM NETWORK LAYER : CONNECTION-ORIENTED SERVICE

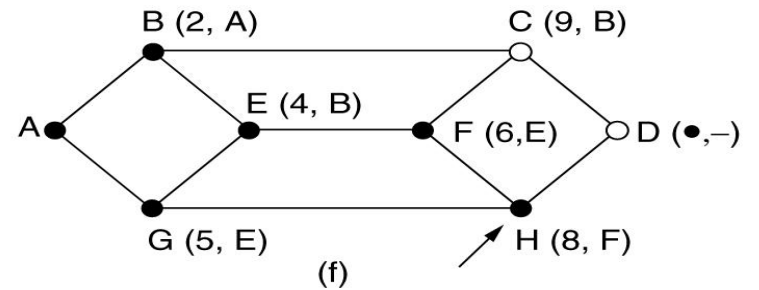
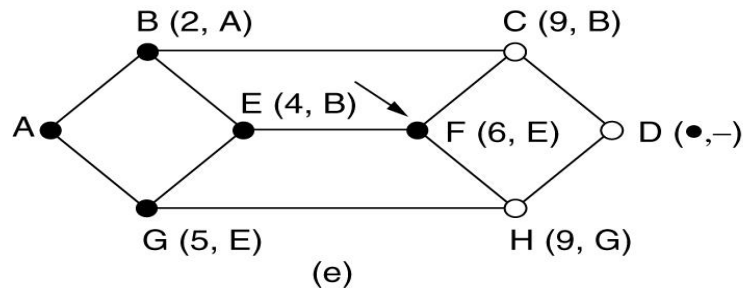
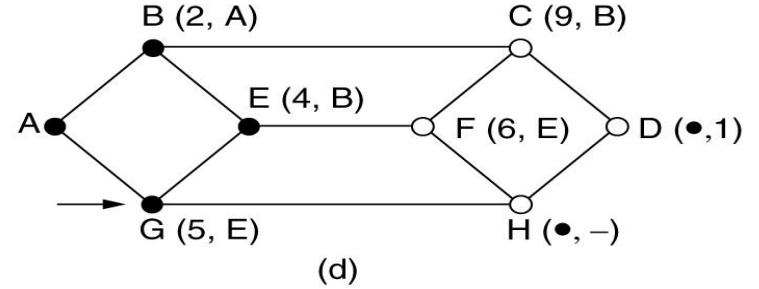
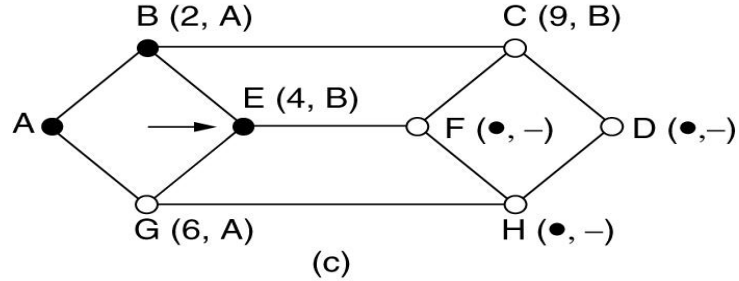
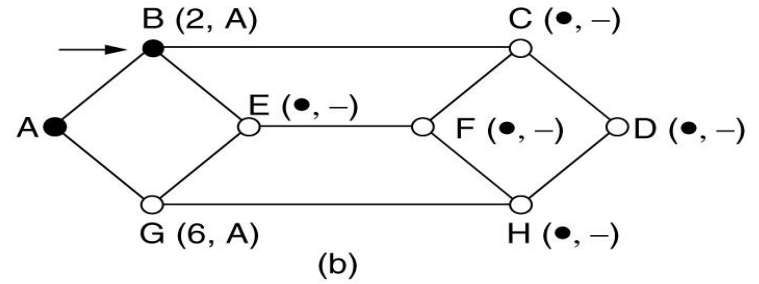
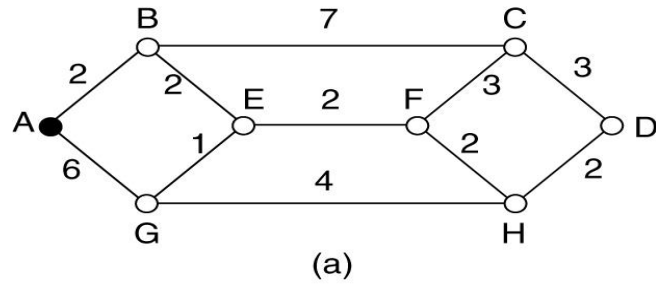


A's table		C's table		E's table	
H1	1	A	1	C	1
H3	1	A	2	C	2
In				Out	
		E	1	F	1
		E	2	F	2

## CONNECTIONLESS VS. CONNECTION-ORIENTED

<b>Issue</b>	<b>Datagram subnet</b>	<b>Virtual-circuit subnet</b>
Circuit setup	Not needed	Required
Addressing	Each packet contains the full source and destination address	Each packet contains a short VC number
State information	Routers do not hold state information about connections	Each VC requires router table space per connection
Routing	Each packet is routed independently	Route chosen when VC is set up; all packets follow it
Effect of router failures	None, except for packets lost during the crash	All VCs that passed through the failed router are terminated
Quality of service	Difficult	Easy if enough resources can be allocated in advance for each VC
Congestion control	Difficult	Easy if enough resources can be allocated in advance for each VC

# SHORTEST PATH ALGORITHM



The first 5 steps used in computing the shortest path from A to D.  
The arrows indicate the working node.

# Multiple Choice Question

## MUTIPLE CHOICE QUESTIONS:

Sr no	Question	Option A	Option B	OptionC	OptionD
1	What is auto negotiation?	a procedure by which two connected devices choose common transmission parameters	a routing algorithm	a security algorithm	encryption algorithm
2	Ethernet in metropolitan area network (MAN) can be used as _____	pure ethernet	ethernet over SDH	ethernet over MPLS	all of the mentioned
3	A point-to-point protocol over ethernet is a network protocol for _____	encapsulating PPP frames inside ethernet frames	encapsulating ethernet framse inside PPP frames	for security of ethernet frames	for security of PPP frames
4	High speed ethernet works on _____	coaxial cable	twisted pair cable	optical fiber	unshielded twisted pair cable
5	The maximum size of payload field in ethernet frame is _____	1000 bytes	1200 bytes	1300 bytes	1500 bytes



# REFERENCES

- <http://www.engppt.com/2009/12/networking-fourzan-ppt-slides.html>

