Paper Id: 250777

Roll No:

BTECH
(SEM VI) THEORY EXAMINATION 2024-25
COMPUTER NETWORKS

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **02 x 7 = 14**

Q no.	Question	CO	Level
a.	Determine the number of links needed for a fully connected mesh topology with 10 nodes.	1	K1
b.	A signal is transmitted with an initial power of 2W and experiences an attenuation of -3 dB. Calculate the received power.	1	K2
c.	In what situations, contention-based MAC Protocols are suitable?	2	K3
d.	Illustrate the concept of 'piggybacking'.	2	K3
e.	List the functions of all layers in OSI reference model using a well labelled diagram.	1	K2
f.	List various policies that are used for congestion control.	4	K3
g.	What is the role of stub in Remote Procedure Call (RPC) mechanism?	5	K3

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

a.	A bit stream $x^8+x^5+x^3+x^2+x+1$ is transmitted using CRC method. The generator polynomial is x^4+x^2+x+1. Show the actual codeword transmitted at the receiver side. Suppose the third bit from left is inverted during transmission. Show that this error is detected at the receiver end.	2	K3
b.	A company is assigned the address block 192.168.10.0/24. Divide it into 4 subnets and specify subnet ranges.	3	K3
c.	Define Leaky Bucket Algorithm. How does Token Bucket Algorithm provide better traffic shaping control?	4	K3
d.	Explain public key cryptography. List its advantages and disadvantages. Explain the working of RSA algorithm with suitable example.	5	K3
e.	Describe the following: (i) SNMP (ii) DNS iii) Data Compression	6	K2

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Illustrate the concept of slotted ALOHA with suitable diagram. Measurement of slotted ALOHA channel with infinite number of users shows that 10% of slots are idle. Calculate i) What is the channel load ? ii) What is the throughput ?	2	K3
b.	A 4 MB frame is transmitted over a 100 KM link with 2 Mbps bandwidth Propagation speed is 2×10^8 m/s. Compute total delay (latency) if there are 5 routers, each with 1 μs processing and 2 μs queuing delay.	2	K3

4. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Discuss how the count-to-infinity problem occurs in Distance Vector Routing. Suggest any one method to mitigate it.	3	K3

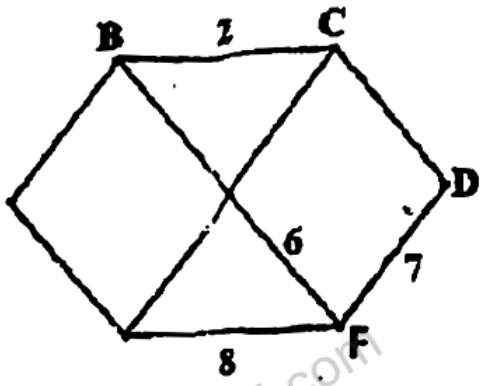
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b.	For the following subnet, distance vector routing is used and the vectors that have just come into router C: from B: (5, 0, 8, 12, 6, 2) from D: (16, 12, 6, 0, 9, 10); and from E: (7, 6, 3, 9, 0, 4). The measured delays to B, D and E are 6, 3, and 5 respectively. Calculate C's new routing table. Give both the outgoing line to use and the expected delay. 	3	K3

5. Attempt any *one* part of the following: 07 x 1 = 07

a.	Explain new features in IPv6 over IPv4 What is the purpose of multiple headers? Explain in brief, how IPv6 handles multiple headers.	3	K2
b.	Explain the following: (i) RARP (ii) DHCP (iii) VPN	3	K2

6. Attempt any *one* part of the following: 07 x 1 = 07

a.	What is Silly Window Syndrome? Explain how sender and receiver can avoid it using Nagle's and Clark's algorithms.		
b.	Explain TCP segment header. Also, illustrate the TCP connection management.	4	K3

7. Attempt any *one* part of the following: 07 x 1 = 07

a.	Explain how SMTP can handle transfer of videos and images? Also, explain the advantages of IMAP4 over POP3 mail access protocols.	6	K2
b.	Explain the following: (i) FTP (ii) HTTP iii) Telnet	6	K2

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