

Paper Id: 250777

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Subject Code: BCS603

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

02 x 7 = 14

1. Attempt all questions in brief.

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 $x^8+x^6+x^3+x^2+x+1$ is transmitted using CRC method. The generator polynomial is x^4+x^2+x+1 . Show the actual code word 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.		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:

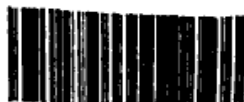
07 x 1 = 07

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 1000 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 μ s processing and 2 μ s queuing delay.	2	K3

07 x 1 = 07

4. Attempt any one part of the following:

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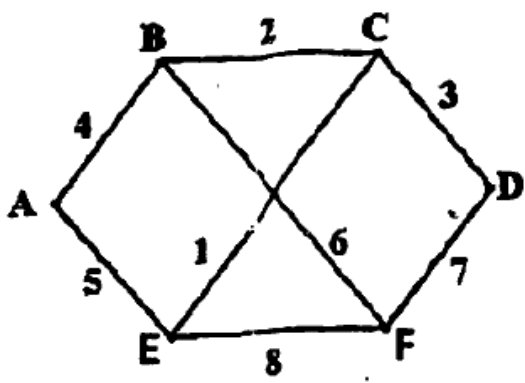
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b.	For the following subnet, distance vector routing is used and the vectors that have just come into router C: from B: (5, 0, 8, 12, 6, 2) from D: (16, 12, 6, 0, 9, 10); and from E: (7, 6, 3, 9, 0, 4). The measured delays to B, D and E are 6, 3, and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