

Semester IV (B.Tech.)

Er. No. 221B145

Academic Year: 2023-24

Jaypee University of Engineering & Technology, Guna**T-1(Even Semester 2024)**

18B11CI411 – Computer Networks

Maximum Duration: 1 Hour

Maximum Marks: 15

Notes:

1. This question paper has 5 questions.
2. Write relevant answers only.
3. Do not write anything on question paper (Except your Er. No.).

		Marks	CO
Q1.	Describe the function of each layer in TCP/IP and OSI reference model.	[03]	CO2
Q2.	Compute the number of links (cables), input out (I/O) ports, hubs/ repeaters for designing a local area network of 6 PCs. Your calculations must show the requirements of aforementioned items in each topology. Also depict your topologies containing required components with neat diagrams.	[03]	CO3
Q3.	Compute the latency for downloading 250MB (Megabytes) document if the bandwidth of the network is ten Mbps? The network consists of four devices including PC-1 requests a file transfer, PC-2 which receives the request from PC-1 and transfers the file, and two intermediate devices. Each intermediate device takes approximately two milliseconds for receiving and retransmitting the data, whereas the PC-2 is a busy device which takes fifty milliseconds to reply any request. Distance between the client and the server is 12,000 km. Assume signals travels at the speed of 2.5×10^8 m/s.	[03]	CO4
Q4.	Show the use of layers (considering TCP/IP protocol stack) at each device when data is transferred between the Client and the Server in the network shown in fig. 1.	[03]	CO3

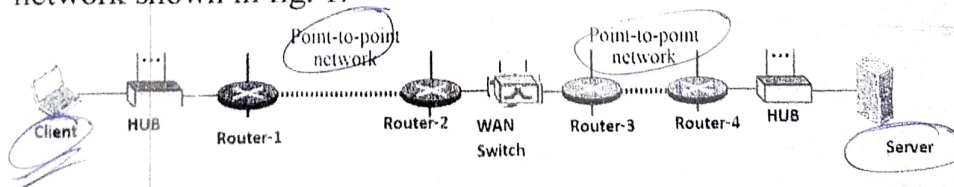


Figure 1

Q5. Byte-stuff the following sequence of characters in which \$ is the escape byte, # is the flag byte, and T is a text data byte.

CO5

[03]

T	\$	T	T	\$	T	T	\$	#	T	#	T
---	----	---	---	----	---	---	----	---	---	---	---

Assume the binary equivalent of above symbols as:

T → 11100111, \$ → 11001111, and # → 10000001.

What is the string actually transmitted after byte stuffing? Is it the best efficient method for framing? If no, suggest the efficient alternative method which shows the data actually transmitted and compare the efficiency in terms of extra overhead.

Jaypee University of Engineering & Technology, Guna**T-2(Even Semester 2024)****18B11CI411 – Computer Networks**

Maximum Duration: 1 Hour 30 minutes

Maximum Marks: 25

Notes:

1. This question paper has 5 questions.
2. Write relevant answers only.
3. Do not write anything on question paper (Except your Er. No.).

- | | Marks | CO
No.
CO3 |
|--|--------------|---------------------------|
| Q1. A network transmits 400-bit frames on a shared channel of 400 kbps.
What is the throughput if the system (all stations together) produces <ol style="list-style-type: none"> a. 1000 frames per second? b. 500 frames per second? c. 250 frames per second? Compare the throughput of Pure Aloha with Slotted Aloha in each case. | [05] | CO3 |
| Q2. Dataword: 1001111001 divisor: 10111
Compute the codeword to be transmitted by data link layer, and also analyze the condition wherein an erroneous channel delivers the codeword as 10011110011001 Will the receiver extract dataword? Justify your answer. | [05] | CO5 |
| Q3. A network shown in figure 1 connected by a link of bandwidth 10 Mbps.
When a bit starts its journey from station A to station B it takes 8 μ s to reach B, from B to C it takes 12 μ s, and from C to D it takes 5.6 μ s. What should be the minimum size of the frame for maximum throughput? | [05] | CO4 |

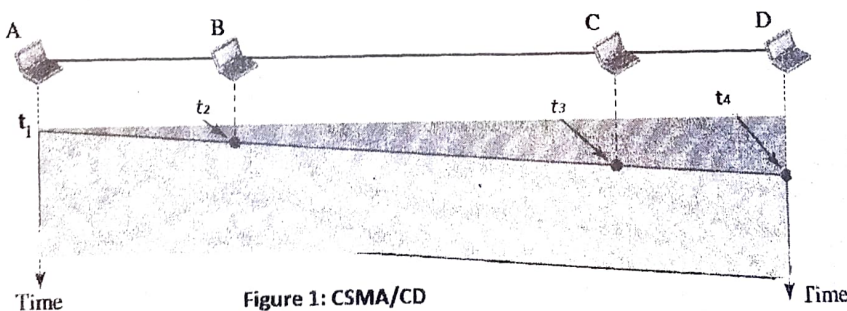


Figure 1: CSMA/CD

Q4. An ISP **XYZ Enterprises** is granted an IP address block 110.56.0.0/16. The network admin decides to connect two networks **net-1** which has 253 computers and **net-2** which has 510 computers. Evaluate the network address, subnet mask, for net-1 and net-2. Also mention first and last computer's address in each network. Make sure minimum wastage of addresses.

CO4

Q5. Draw diagrams of different frame types which are used in high-level data link control. Also explain options available in control field.

CO1

Semester IV (B.Tech)

Er. No. 221B145
Academic Year: 2023-24**Jaypee University of Engineering & Technology, Guna****T-2(Even Semester 2024)****18B14HS441– CONCEPT OF DIGITAL MARKETING**

Maximum Duration: 1 Hour 30 minutes

Maximum Marks: 25

Notes:

1. This question paper has 05 questions.
2. Write relevant answers only.
3. Do not write anything on question paper (Except your Er. No.).

	Marks	CO No.
Q1. “A digital marketer must proactively formulate all the main strategies by which consumers may visit a company website”. Analyze these strategies in brief. List the three goals and the corresponding three methods of content marketing.	[3+2]	CO4
Q2. Compare and contrast market segmentation, targeting and positioning with the help of an example. Which are the two major criteria to effectively evaluate different market segments? Describe in brief.	[3+2]	CO4
Q3. Explain the following terms with an example: <ul style="list-style-type: none"> • Keyword Stuffing • Link Spam • Content Farm 	[5]	CO2
Q4. Critique the major limitations of the brand resonance pyramid. Draw a diagram of the brand resonance pyramid along with a flow of customer questions and reactions.	[2+3]	CO5
Q5. Demonstrate how digital marketing and traditional marketing can converge. Justify your answer with few examples. Draw a sketch to show how digital marketing can be used as an integrated communications tool as part of supporting a multichannel customer journey.	[3+2]	CO3

Jaypee University of Engineering & Technology, Guna**T-3 (Even Semester 2024)****18B11CI413- OPERATING SYSTEMS**

Maximum Duration: 2 Hours

Maximum Marks: 35

Notes:

1. This question paper has SEVEN questions.
2. Write relevant answers only.
3. Do not write anything on question paper (Except your Er. No.).

- | | | | |
|------------|--|--------------|---------------|
| | | Marks | CO No. |
| Q1. | Describe the actions taken by a kernel to context-switch between processes by suitable example. | [05] | CO1 |
| Q2. | Consider the following set of processes, with the length of the CPU burst given in milliseconds: | | CO2 |

Process	Burst Time	Priority
P ₁	10	3
P ₂	1	1
P ₃	2	3
P ₄	1	4
P ₅	5	2

The processes are assumed to have arrived in order P₁, P₂, P₃, P₄, P₅ all at time 0.

- | | | | |
|------------|--|-------------|------------|
| | (a) Draw the Gantt chart that illustrate the execution of these processes using priority scheduling. | [02] | |
| | (b) What is average turnaround time? | [01] | |
| | (c) What is average waiting time? | [01] | |
| | (d) Calculate the average response time. | [01] | |
| Q3. | Show that, if the wait () and signal () semaphore operations are not executed atomically, then mutual exclusion may be violated. Explain the role wait () and signal () operation in semaphores. | [05] | CO2 |

Q4.

Consider the following page reference string:

7, 2, 3, 1, 2, 5, 3, 4, 6, 7, 7, 1, 0, 5, 4, 6, 2, 3, 0, 1.

Assuming demand paging with three frames, how many page faults would occur for the following replacement algorithms?

[06]

CO3

- (a) LRU Replacement
- (b) Optimal Replacement
- (c) LFU Replacement
- (d) MFU Replacement

Q5.

Given six memory partitions of 100 MB, 170 MB, 40 MB, 205 MB, 300 MB, and 185 MB (in order), how would the first-fit, best-fit, next-fit and worst-fit algorithms place processes of size 200 MB, 15 MB, 185 MB, 75 MB, 175 MB, and 80 MB (in order)? Indicate which—if any—requests cannot be satisfied. Comment on how efficiently each of the algorithms manages fragmentation in memory.

[04]

CO4

Q6.

Consider the following snapshot of a system:

CO3

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
T ₀	0	0	1	2	0	0	1	2	1	5	2	0
T ₁	1	0	0	0	1	7	5	0				
T ₂	1	3	5	4	2	3	5	6				
T ₃	0	6	3	2	0	6	5	2				
T ₄	0	0	1	4	0	6	5	6				

Answer the following questions using the banker's algorithm:

- (a) What is the content of the matrix *Need*? [01]
- (b) Is the system in a safe state? [02]
- (c) If a request from thread T₁ arrives for (0,4,2,0), can the request be granted immediately? [02]

Q7.

Explain the purpose of the open () and close () operation in file system using suitable example.

[05]

CO5

Jaypee University of Engineering & Technology, Guna

T-3 (Even Semester 2024)

18B11CI411 – Computer Networks

Maximum Duration: 2 Hours

Maximum Marks: 35

Notes:

1. This question paper has 05 questions.
2. Write relevant answers only.
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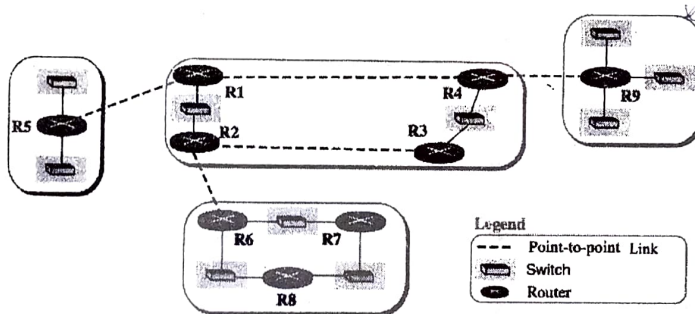
Q1. The following is the contents of a UDP header in hexadecimal format. **Marks** CO No.
[07] CO3

CB84000D001C001C

- (i) What is the source port number?
- (ii) What is the destination port number?
- (iii) What is the total length of the user datagram?
- (iv) What is the length of the data?
- (v) Is the packet directed from a client to a server or vice versa?
- (vi) What is the client process?

Q2.

CO4



Assume the network (shown above) is fully configured using distance vector / link state routing and every part of the network is reachable from anywhere. Find following:

- (a) Number of networks [03]
- (b) Number of networks learned through routing algorithm will be listed, If you check at R9. [04]

- Q3.** An IPv4 header without options field is shown below. Calculate the checksum which is to be filled in checksum field of header. [07] CO5

4	5	0	28	
49.153			0	0
4	17		<to be filled>	
10.12.14.5				
12.6.7.9				

- Q4.** Demonstrate recursive and iterative resolution of www.juet.ac.in with the help of separate diagrams mentioning steps in sequential manner. [07] CO5
- Q5.** Explain hamming distance. See following codewords: CO2

000
011
101
110

- (a) How many bit errors it can detect? [03]
- (b) How many bit errors it can correct? [04]