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Code No. : 15651 N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

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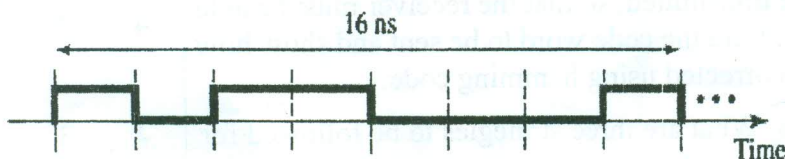
B.E. (I.T.) V-Semester Main & Backlog Examinations, Jan./Feb.-2024**Data Communications and Computer Networks**

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Consider a network with n devices. Determine the number of transmission links required for a) mesh, b) ring, c) bus, and d) star topology	2	3	1	1
2.	Determine the bit rate for the signal given below and mention it in Mbps. 	2	3	1	2
3.	Find the Hamming distance for the given codewords. $d(10101, 10000)$	2	2	2	1
4.	What is the remainder obtained by dividing 10100001 by the generator polynomial 1001?	2	3	2	2
5.	Define Flooding. List out its disadvantages.	2	1	3	1
6.	You have a network ID of 131.107.0.0 and you need to divide it into multiple subnets. You need 600 host ID's for each subnet with the largest amount of subnets available. Which subnet mask should you assign?	2	3	3	2
7.	How does fragmentation and reassembly in the IP protocol differ from fragmentation and reassembly in the TCP protocol? (a) TCP fragmentation ever occurs only once at the source host, while IP fragmentation may occur at each router between the source host and destination (b) In both cases however, reassembly is only performed once, when the data reaches its final destination (c) TCP fragmentation is based on the value of a TOP parameter called MSS (Maximum Segment Size). And IP fragmentation is based on the value of a parameter called MTU (Maximum transmission Unit) (d) All of above	2	2	4	1
8.	List the techniques to improve Quality of Service	2	1	4	1
9.	Write two functions of Application layer.	2	1	5	1
10.	Define SNMP. Mention its use.	2	1	5	1

Contd... 2

Part-B (5 × 8 = 40 Marks)					
11. a)	Explain in detail the OSI model and TCP/IP model of data communication. Compare and contrast both models using different features. Which model is suitable for an effective data communication?	5	1	1	1
b)	If the data rate of ring is 20 Mbps, signal propagation speed is 200 m/s, find the number of bits that can be placed on the channel of 200 Km.	3	1	1	2
12. a)	Give reason as to, why collision is an issue in a random access protocol but not in controlled access or channelizing protocols. Explain briefly the controlled access protocol.	4	2	2	1
b)	A Message 1001 is to be transmitted, so that the receiver must be able to correct a one-bit error. Find the code word to be sent and show how a single bit error can be corrected using hamming code.	4	3	2	2
13. a)	Compare IPv4 with IPv6. What are three strategies to be followed for transition from IPv4 to IPv6?	4	3	3	2
b)	Explain the steps involved in Link state routing algorithm. Determine the entries of final routing table for the given network scenario.	4	3	3	2
14. a)	Describe congestion control mechanism used in TCP.	4	2	4	1
b)	In a leaky bucket used to control liquid flow, how many gallons of liquid are left in the bucket if the output rate is 6 gal/min, there is an input burst of 100 gal/min for 11 sec, and there is no input for 49 sec?	4	3	4	2
15. a)	Explain how the requested services are provided by DNS.	4	2	5	1
b)	In SMTP ,	4	3	5	2
	(i) Show the connection establishment phase from <u>abc@one.com</u> to <u>xyz@two.com</u>				
	(ii) Also show the Message transfer phase , message is “Good Morning”.				

16. a)	Write the characteristics and applications of various transmission media and compare all of them.	4	2	1	1
b)	What is the reason of using selective repeat ARQ rather than Go-Back-N ARQ? Describe briefly selective repeat protocol.	4	2	2	1
17.	Answer any <i>two</i> of the following:				
a)	An organization is granted the block 130.56.0.0/16 and the administrator wants to create 1024 subnets. Find the answer for the following a. Subnet mask. b. Number of addresses in each subnet. c. First and last addresses in subnet 1. d. First and last addresses in subnet 1024.	4	3	3	2
b)	Discuss in detail about connection management in Transmission Control Protocol.	4	2	4	1
c)	Explain in detail about email architecture.	4	2	5	1

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%
