APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Scheme for Valuation/Answer Key

Scheme of evaluation (marks in brackets) and answers of problems/key

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2021

Course Code: CST 303

Course Name: COMPUTER NETWORKS

Max. Marks: 100 Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks) Marks

1	Explanations of Broad cast links -1.5 Point-to-point links – 1.5	3
2	transmission time = (packet length)/(bandwidth) = 1 million bytes/ 200 Kbps (8,000,000 bits) / (200,000 bps) = 40 s	3
3	Bit string: 01111101111101111110 Flag: 01111110 String actually transmitted after bit stuffing: 01111110 01111011111011111010 01111110	3
4	Binary exponential backoff algorithm for selecting randomization interval in Ethernet => random waiting time is selected for i^{th} attempt from 0-2^i intrval - 3 marks	3
5	Optimality principle -1.5 Sink tree Definition – 1.5	3
6	Explanation of Count-to-Infinity problem in distance vector routing with figure -3	3
7	Subnet Mask : - 255.255.240.0 **11111111.11111111.1111**0000.00000000 | **Netid** | hostid | It is a class B network. For a class B network, the upper 16 bits form the network address and lower 16 bits are subnet and host fields. Of the lower 16 bits most significant 4 bits are 1111.This leaves 12 bits for the	3

host number.So,4096(2^{12}) host address exists. That is, Actual host addresses are- 4096

But, First and Last address are special so the maximum number of addresses that can be used as host address =4096-2=4094

8 Function of RARP -3 3

9 UDP Definition – 1 3

Drawing and explanation of UDP header format -2

10 Five basic functions supported by an e-mail – 3 3

E-mail systems support five basic functions.

- **Composition** refers to the process of creating messages and answers.
- **Transfer** refers to moving messages from the originator to the recipient.
- **Reporting** has to do with telling the originator what happened to the message.
- **Displaying** incoming messages is needed so people can read their e-mail.
- **Disposition** is the final step and concerns what the recipient does with the message after receiving it.

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

11 a) ISO OSI reference model diagram – 3 8

Functionalities of Seven layers in the model - 5

b) Five Service primitives required to implement a connection-oriented service. + Explanation - 6 6

12 a) Guided media for communication : Coaxial cable, twisted pair, fiber optic cable -2 8

Explanation on the cable type, connectors and applications of each of them -6

b) Explanations of simplex, half duplex and full duplex mode with diagrams - 1.5 * 3 = 4.5 6

Examples for each - .5 *3 = 1.5

Module -2

13	a)	Concept of Sliding window protocols - 2 Working of One bit sliding window, Selective repeat and Go-back- N bidirectional protocols – 2*3 =6	8
	b)	Bit stream transmitted: 10011101 Generator polynomial : $x^3 + 1$ The actual bit string transmitted using CRC method: 10011101100	6
14	a)	Devices operating in datalink layer : Switch and Bridge Devices operating in physical layer : Repeater and Hub Function of each of them -4*2 =8	8
	b)	Drawing of IEEE 802.11 frame structure – 2 Explanation of fields - 4	6

Module -3

15	a)	Going via B gives (11, 6, 14, 18, 12, 8). Going via D gives (19, 15, 9, 3, 9, 10). Going via E gives (12, 11, 8, 14, 5, 9). Taking the minimum for each destination except C gives (11, 6, 0, 3, 5, 8). The outgoing lines are (B, B, -, D, E, B)	8
	b)	Explanation of the mobile host's packet routing process consisting of four steps -4 Figure - 2	6
16	a)	Congestion Definition – 2 Congestion's effect network performance: packet drop and reduced throughput – 1 Any five congestion control techniques for datagram networks - 5	8
	b)	Mulcast routing steps – group management, spanning tree construction, pruning - 3*2 =6	6

Module -4

17	a)	Drawing of the header format of IP packets– 4 Explanation - 4	8
	b)	Function of ARP - 2	6

		Working involving ARP request, response, ARP cache, ARP cahe timeout - 4	
18	a)	Exterior gateway routing protocol -2 Steps in BGP working: Peer acquisition and authentication, sending reachability information, verification + BGP route information management functions - 6	8
	b)	Internet multicasting – 1.5 IGMP -1.5 Any three IGMP messages -3	6
		Module -5	
19	a)	TCP Definition -1 Drawing of TCP segment header – 3 Explanantion – 2 TCP connection establishment process -2	8
	b)	SNMP basic components and their functions – 3 The basic commands used in SNMP -3	6
20	a)	DNS Definition -2 Resource record -2 Name server -2 Illustration of DNS working - 2	8
	b)	FTP definition -1 Its working separate control and data paths – 2 FTP commands and replies - 3	6

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