

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S5 (R,S) (FT/WP)(S3 PT) Examination November 2025 (2019 Scheme).

Course Code: CST303**Course Name: COMPUTER NETWORKS**

Max. Marks: 100

Duration: 3 Hours

PART A*(Answer all questions; Each question carries 3 marks)*

Marks

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|----|---|---|
| 1 | A communication link has a bandwidth of 20 Mbps and transmits an average of 25,000 frames per minute, each carrying 10,000 bits of data. Find the throughput and efficiency of the network. | 3 |
| 2 | With appropriate example and diagram explain different modes of communication. | 3 |
| 3 | Explain the significance of Hamming distance in error detection and correction. What is the hamming distance between the code word '11001011' and '10000111'? | 3 |
| 4 | Explain the function of the Medium Access Control sublayer and how it regulates access to a shared transmission medium. | 3 |
| 5 | How to overcome the Count-to-Infinity problem in distance vector routing? | 3 |
| 6 | Differentiate between unicast, broadcast, and multicast transmission modes with suitable examples. | 3 |
| 7 | Discuss the functionalities of ARP and RARP protocols. | 3 |
| 8 | In the IPV4 addressing format, find out the number of networks allowed under class C address. Justify your answer. | 3 |
| 9 | Compare the UDP and TCP protocols in terms of reliability, connection type, and suitable application scenarios. | 3 |
| 10 | Describe the steps involved in DNS address resolution. | 3 |

PART B*(Answer one full question from each module, each question carries 14 marks)***Module -1**

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| 11 | a) Discuss the different signal encoding schemes used in the physical layer. Sketch waveforms for the binary sequence 10100111001 using Manchester and Differential Manchester encoding schemes. | 10 |
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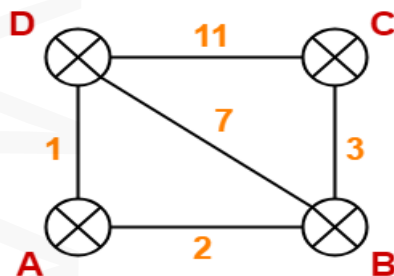
- b) Write short notes on following topologies. 4
- a) Mesh topology
- b) Bus topology
- 12 a) Compare TCP/IP reference model with ISO OSI reference model. 8
- b) Discuss about guided and unguided media with appropriate diagram. 6

Module -2

- 13 a) Explain the working of HDLC protocol. Draw HDLC frame format and the different types of HDLC control frames. 6
- b) Illustrate the operation of a Go-Back-N ARQ protocol with a suitable timing diagram showing data frames, acknowledgments, and retransmissions. 8
- 14 a) Explain the purpose and working of CSMA/CA in wireless LAN. 6
- b) A bit stream 1010001101 is transmitted using the standard CRC method. The generator polynomial used is 110101. Show the actual bit string transmitted. 8

Module -3

- 15 a) Use DVR algorithm and find out the distance vectors of the nodes A,B,C,D after second iteration 10



- b) Identify and describe the scheduling techniques to improve the Quality of Services (QoS). 4
- 16 a) Give detailed description about Link state routing algorithm with appropriate diagram. 10
- b) Explain the steps involved in Multicast routing. 4

Module -4

- 17 a) A company has been assigned the address block 192.168.50.0/24. It needs to create four subnets for different departments with the following requirements: 8

Subnet A: 100 hosts

Subnet B: 50 hosts

Subnet C: 25 hosts

Subnet D: 10 hosts

Find the subnet ID, subnet mask, and address range for each subnet.

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| | b) | Draw and explain the header format of IPv4 packets. | 6 |
| 18 | a) | How does OSPF ensures efficient and reliable routing in large-scale networks compared to distance vector routing protocols? | 7 |
| | b) | Illustrate the working of Dynamic Host Configuration Protocol (DHCP) with the sequence of message exchange between client and server. | 7 |

Module -5

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| 19 | a) | What is TCP? Draw and explain TCP segment header. Explain TCP connection establishment process. | 8 |
| | b) | Explain SNMP basic components and their functions | 6 |
| 20 | a) | Explain the purpose and functions of any four application layer protocols. | 8 |
| | b) | Summarize the architecture of electronic mail system with neat diagram. | 6 |