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MCS–218

MASTER OF COMPUTER APPLICATIONS (MCA) (NEW)

Term-End Examination

December, 2023

MCS-218 : DATA COMMUNICATION AND COMPUTER NETWORKS

Time : 3 Hours *Maximum Marks : 100*

Note : *(i) Question No. **1** is compulsory and carries 40 marks.*

*(ii) Attempt any **three** questions from the rest.*

1. (a) Define Network Topology. Compare Star and Bus topologies. 5

(b) Define Hamming Code. Write the bit stream generated by Hamming code for 001100. 5

(c) Explain the process of piggybacking with the help of an appropriate diagram. 5

(d) How does CSMA/CD differ from CSMA/CA ? 5

(e) Compare connection oriented with connectionless services. 5

(f) Define the term network congestion problem. Explain the methods to deal with it. 5

(g) Differentiate leaky bucket and token bucket traffic shaper mechanisms. 5

(h) Describe three-way handshake mechanism with the help of a diagram. 5

2. (a) Explain ATM network technology. Write its advantages and disadvantages. 6

(b) Discuss the issues faced by the signal when it is transmitted over the transmission lines. 6

(c) Define modulation. Why is it required ? Discuss the types of modulation. Why is Amplitude Modulation (AM) most susceptible to noise ? 8

3. (a) State the functionality of data link layer. Name different methods for framing. Give an example for each type of framing. 7

   (b) What are the limitations of stop and wait flow control mechanism ? Discuss how sliding window protocol deals with their issues. 6

   (c) Define vulnerable period. Draw throughput *vs.* load graph for pure ALOHA and slotted ALOHA. Give an expression for throughput with an assumption of no collision. 7

4. (a) Define IP address. Compare virtual circuit with datagram subnet. 5

   (b) Explain Adaptive and Non-adaptive routing algorithms. Describe the concept of flooding. 5

   (c) Define Count to Infinity problem. How does link state routing overcome with it ? Explain the link state routing operations. 5

   (d) How Border Gateway Protocol (BGP) solve count to infinity problem ? Name the routers identified by OSPF. 5

5. (a) Explain Quality of Services provided by the transport layer. 5

(b) Compare and contrast the flow control. Explain the flow-control and buffering mechanism at the transport-layer. 5

(c) Explain Nagle's algorithm. How does it overcome the problem of wastage of bandwidth ? 5

(d) Discuss Virtual Private Network (VPN) standard. Explain its types. 5