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MCS–218

MASTER OF COMPUTER APPLICATIONS (MCA–NEW)

Term-End Examination

June, 2024

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) Differentiate between Analog and Digital signals. Draw the diagrams for both. 5

   (b) Define vulnerable period. Give an expression of throughput in pure ALOHA. Also differentiate pure ALOHA with slotted ALOHA. 5

(c) Define bridge. In which scenario bridge should be used ? What are the characteristics of it ? 5

(d) Describe transmission and propagation delays. Explain the working of a fibre-optic cable. 5

(e) List and explain the functionalities of various layers in OSI reference model. 5

(f) Explain count to infinity problem with the help of an example. 5

(g) Explain the features of M2M communication. Differentiate between Leaky bucket and Token bucket shaper. 5

(h) Define cryptography, encryption, decryption and block-cipher. Give an example of modulo function. 5

2. (a) Describe Automatic Repeat Request (ARQ). Also discuss the following methods for flow and error control : 12

(i) Stop and Wait ARQ

(ii) Selective Repeat ARQ

(b) Explain circuit and packet switching. Give an example where circuit switching should be applied. 8

3. (a) What do you mean by error detection ? Cyclic Redundancy Check (CRC) is used to detect which type of error ? Determine CRC for the bit sequence 1101011011 where the generator polynomial key is 10011. 7

(b) Explain Wireless LAN protocols. What are the features of MACAW which extends MACA to improve the performance ? 6

(c) What is Multiplexing ? Explain synchronous time division multiplexing. 7

4. (a) Explain the concept of congestion and routing in networks. Draw the graph for throughput and delay in poor and good routing. 5

(b) Explain the working of Dijkstra's algorithm. 5

(c) Define Hierarchical Routing. In which scenario, it is more advantageous ? Explain Reverse Path forwarding mechanism. 5

(d) Explain the mechanism on which open loop algorithm work. How is congestion controlled in packet switched network ? 5

5. (a) Describe the services required by application layer from transport layer. 5

(b) Enlist important features of UDP. Give an example where it can be used. 5

(c) Explain Remote Procedure Cell (RPC) with the help of an appropriate block diagram. 5

(d) Find the secret key using Diffie Hellman for the case, where : 5

User 1 : Public Key = 33, Private key = 3

User 2 : Public key = 8, Private key = 8.

And User 1 is sender, User 2 is receiver.