MCS-218

MASTER OF COMPUTER APPLICATIONS (MCA) (NEW)

Term-End Examination

December, 2021

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) Find the CRC for the data polynomial $x^9 + x^7 + x^5 + x^2 + 1$, with the generator polynomial $x^3 + x + 1$. 3

   (b) What is a Local Area Network (LAN) ? What are the typical characteristics of a LAN ? 5

   (c) Write the characteristics of transmission and propagation delays. 4

   (d) Differentiate between congestion control and flow control. 4

   (e) Compare layer 2 and layer 3 switches. 5

   (f) Explain key generation algorithm for RSA. Explain its process with an example. 6

   (g) Discuss the QAM (Quadrature Amplitude Modulation) technique. Draw 8-QAM constellation diagram. 7

   (h) Draw IPv4 header structure and explain the significance of flags. 6

2. (a) Which frequency bands are used for AM, FM and Radar bands ? Write the relationship between tower height and distance between repeaters. 5

   (b) Explain why PAM is a necessary pre-requisite to PCM ? What would be the minimum sampling interval needed for reconstructing a signal with highest frequency of 1 kHz ? 5

(c) Explain the concept of circuit and packet switching, with a suitable example.   5

(d) Compare star and tree topology in detail with a suitable diagram.   5

3. (a) What is a Hamming Code ? How many redundant bits are required to identify errors in a character of 7 bits. Also mention the specified positions for inserting these redundant bits.   5

(b) What is meant by pure ALOHA ? Calculate the throughput of slotted ALOHA protocol.   5

(c) Discuss IEEE 802.11 protocol in detail with a suitable diagram.   10

4. (a) With reference to connection oriented services, what are the steps in connection establishment and termination ?   5

(b) What is Dijkstra's algorithm for shortest path ? Find the best route between points 'A' and 'E' using Dijkstra's algorithm.   10
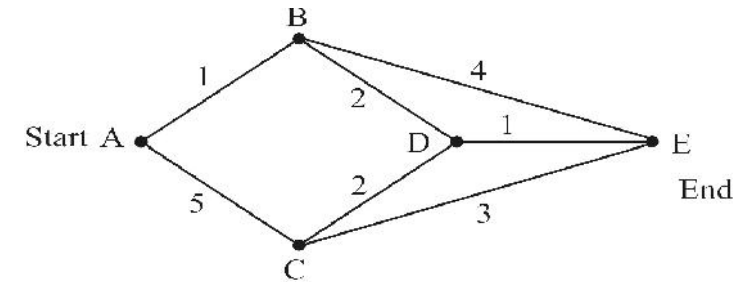
(c) What are the classes in IP addressing ? Explain the rules to determine the address class.   5

5. (a) What is Multiplexing ? Show the upward multiplexing with the help of a diagram. 5

(b) Discuss the contents of a digital certificate. Explain the importance of digital certificate.   5

(c) Explain the concept of RPC in detail. Draw a diagram to explain RPC.   10

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