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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

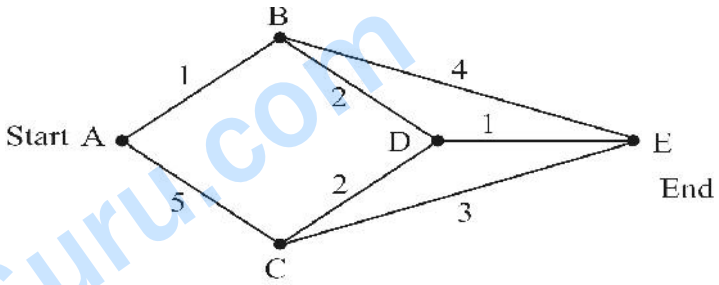
3. (a) What is a Hamming Code ? How many redundant bits are required to identify errors in a character of 7 bits. Also mention the specified positions for inserting these redundant bits. 5

(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