

# RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FOURTH SEMESTER EXAMINATION, AUGUST 2021

SECOND YEAR [BATCH 2019-22]

COMPUTER SCIENCE (Honours)

PAPER : X [CC10]

Date : 11/08/2021

Time : 11 am – 1 pm

Full Marks : 50

Answer **any five** of the following questions:

[5×10]

1. a) What is constellation diagram? Explain its use with example.  
b) A mesh network has one coordinator and six end devices. Determine the number of channels.  
c) What is footprint? [5+3+2]
2. a) A signal travels from point A to point B. At point A, the signal power is 100 W. At point B, the power is 90 W. What is the attenuation in decibels?  
b) What would be the checksum of 10010011100100111001100001001101 if 8-bit segment is used?  
c) What is the role of 'two-dimensional parity check' in error detection and correction? [3+4+3]
3. a) A 4-bit sequence number is used to send a series of packets to the same destination. If the sequence numbers start with 0, what is the sequence number of 51<sup>st</sup> packet?  
b) Encode 11010010 using differential Manchester line coding scheme.  
c) Differentiate between PCM and DM. [4+4+2]
4. a) A pure ALOHA network transmits 100-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces i) 1000 frames per second ii) 200 frames per second?  
b) Routers work in network layer. What will happen if we use a router just to connect two segments of a LAN cable?  
c) Compare node-to-node, host-to-host and process-to-process data delivery. [(2+2)+3+3]
5. a) You are given the following address: 154.50.6.27/25. Determine the subnet mask; address class, subnet address and broadcast address.  
b) A router has the following entries in its routing table:

Address/ mask	Next hop
135.46.56.0/22	Interface 0
135.46.60.0/22	Interface 1
192.53.40.0/23	Router 1
Default	Router 2

- i) What is the next hop the router routes if a packet with the IP addresses 135.46.57.14 arrive at it?
- ii) What is the next hop the router routes if a packet with the IP addresses 135.46.52.2 arrive at it?
- c) Write a short note on logical to physical address mapping. [3+(2+2)+3]

6. a) Explain different data rate management techniques in TDM.  
b) Discuss the advantages and disadvantages of fiber optic cable. [6+4]
7. a) Why do we need a DNS system when we can directly use an IP address?  
b) Explain how CGI handles dynamic web content?  
c) Do port addresses need to be unique? Why or why not? [3+4+3]

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