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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Semester End Main Examinations

Programme: B.E. **Semester: III**
Branch: Artificial Intelligence and Machine Learning **Duration: 3 hrs.**
Course Code: 22AM3PCCNS **Max Marks: 100**
Course: Computer Networks

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1	a)	Calculate the required bandwidth, if, in a communication channel, the signal power is 100 W and noise power is 10 W and the information transmission rate is 10kbps	**10**
	b)	Discuss the devices and protocols of each layer of the OSI reference model & TCP/IP model.	**10**

UNIT - II

2	a)	Illustrate different types of errors that can occur during data transmission.	**10**
	b)	"Reliable transmission can be achieved using stop and wait protocol mechanism". Justify	**10**

OR

3	a)	Find the CRC for the data block 100100 with the divisor 1101	**10**
	b)	Sketch the digital signal for all types of line coding for the digital message 0100110	**10**

UNIT - III

4	a)	Compare different Switching techniques.	**10**
	b)	Given the IP address 180.25.21.172 and subnet mask 255.255.192.0 what is the subnet address?	**5**
	c)	What is the Total delay (Latency) for a frame size of 10 million bits that are being sent up on a link with 15 routers each having queuing time of 2 micro sec and a processing time of 1 micro sec? The length of the link is 3000km. The speed of light inside the link is 2×10^8 m/sec. The link has a bandwidth of 6Mbps.	**5**

OR

5 a) Apply the principles of IPv4 and justify if the following IP address are valid or invalid. **8**

i. 111.57.046.79

ii. 225.34.7.8.20

iii. 76.45.301.40

iv. 11110.23.14.67

b) Hosts A and B are connected to each other via router R. R is a store-and-forward router. The bandwidth from A to R is 10Mbps, and the bandwidth from R to B is 5Mbps. The one-way latency of each link is 22ms. Assume host A sends a 30KB file to host B. **6**

i) Assume the file is divided into two packets, p1 and p2, where p1 has a length of 10KB, and assume the packets are sent back-to-back. What is the difference between the arrival times of the first and the second packet at host B?

ii) What is the effective throughput between A and B in part (i)? (The transmission time is the time interval from the time the first bit is sent at A until the final bit is received at B).

iii) Does the throughput increase or decrease if we divide the file into smaller packets? Why?

c) Differentiate packet switching vs. circuit switching. **6**

UNIT - IV

6 a) "Transport layer ensures that the complete message arrives at the destination in the proper order". Justify with a neat sketch. **8**

b) Differentiate TCP & UDP w.r.t connection, usage, data packet ordering, error checking and acknowledgement with TCP and UDP header formats. **12**

UNIT - V

7 a) Participant A uses two prime numbers p = 11 and q = 03. Using RSA technique determine the public key and private key and also perform encryption and decryption for the message m=7 **10**

b) Discuss the properties of Audio and video applications in multimedia networking. **10**

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