(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1405 Roll No. | | | | | | | | | | |

MCA

THIRD SEMESTER EXAMINATION, 2004-2005

DATA COMMUNICATION AND COMPUTER NETWORK

Time : 3 Hours *Total Marks : 100*

Note : *(i) Attempt ALL questions.*

(ii) All questions carry equal marks.

1. Attempt ***any two*** of the following : – **(10x2=20)**

(a) (i) Discuss the finite limits of a transmission path with Shanon's and Nyquist's formulae ?

(ii) Define the terms Bandwidth and Wavelength in data Communication.

(b) How does digital transmission work ? How does delta modulation improve the performance of PCM (Pulse Code Modulation).

(c) (i) Discuss the channel capacity in the presence of NOISE.

(ii) List the steps that convert an Analog signal to PCM digital code ?

2. Attempt *any two* of the following :– **(10x2=20)**

(a) (i) For the bit stream 100010100 sketch the waveform for Manchester and Differential Manchester coding and also discuss the advantages of the coding schemes.

(ii) With the help of block diagram explain the working of DPSK system.

(b) (i) Three types of impairment can effect an Analog signal transmitted in copper cable; Attenuation, Delay distortion and Noise. Briefly describe each of these impairments and show (by means of a diagram) their effect on an analog signal. Why are impairments to analog signals of significance when transmitting binary data ?

(ii) For binary phase shift keying, Eb/No. = 8.4dB is required for a bit error rate of 10^{-4}. If the effective noise temperature is 290°K and the data rate is 2400 bps, what is the received signal level required.

(c) List the various transmission media used in Local Area Networks. For each of these types of media provide a brief physical description and outline the advantages and disadvantages of each.

3. Attempt *any two* of the following :– **(10x2=20)**

(a) Explain the THREE different types of errors that occur during the transmission and methods of error correction.

(b) Write a C-program fragment to calculate CRC (Cyclic Redundancy Code) for any message using polynomial generator x^4+x^3+x+1 using modulo−2 arithmetic.

(c) (i) Explain briefly the various layers of the ISO OSI model.

(ii) Outline the FOUR (4) layers of the TCP/IP reference model and indicate the roughly equivalent levels of the OSI model.

4. Attempt *any two* of the following :– **(10x2=20)**

(a) (i) Compare the effect of node failure in CSMA/CD and token passing ring.

(ii) Why is an Ethernet not suitable for real-time applications.

(b) What is HDLC protocol ? Discuss its importance in data communication. What are the different types of frames. Explain in brief.

(c) Explain the IEEE 802.3 MAC sublayer frame format ? What is the binary exponential back off algorithm.

5. Attempt *any two* of the following :– **(10x2=20)**

(a) (i) List the similarities and differences between a session and a transport connection.

(ii) Discuss the facilities provided by X.25.

(b) (i) What is ATM ? What can ATM offer to reduced bandwidth bottlenecks that traditional LAN technologies cannot provide ?

(ii) Give the speed of proposed Broadband and ISDN channel.

(c) (i) Describe a suitable congestion control algorithm with an example used for Multicast Routing ?

(ii) Discuss the token passing technique used in FDDI ?

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