This question paper contains **3** printed pages]

Roll No. | | | | | | | | | | | | |

No. of Question Paper : **2048**

Unique Paper Code : **32341303** **GC-3**

Name of the Paper : **Computer Networks**

Name of the Course : **B.Sc. (H) Computer Science (CBCS)**

Semester : **III**

Duration : **3 Hours** Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Part A is compulsory and carries **35** marks.

Attempt any *four* questions from Part B.

Part A

1. (*a*) Name and state the two types of line configuration. 3

(*b*) Assume five devices are arranged in a mesh topology. How many ports are needed for each device ? How many cables are needed in this topology ? 2

(*c*) What is the difference between data element and signal element ? 2

(*d*) What are the parts of a URL ? Give an example. 2

(*e*) State optimality principle. 2

(*f*) What is the use of Urgent Pointer in a TCP header ? 2

(*g*) What is the purpose of options field in an IP Header ? Explain any *two* options. 3

P.T.O.

P.T.O.

(*h*) State count to infinity problem. Give an example.

(*i*) What is QAM ? Give the constellation diagram for 64 QAM.

(*j*) What is the purpose of using Guard Bands in multiplexed channels ?

(*k*) What is the significance of twisting in twisted-pair cables ?

(*l*) What is Discrete Multitone technique ?

(*m*) What is flow control ? How is it handled at data link layer ?

(*n*) Which layer in the OSI model perform the following services ?

(*i*) Translation

(*ii*) Network virtual terminal

(*iii*) Synchronization.

Part B

2. (*a*) Explain layered OSI model, stating the functionality of each layer.

(*b*) Explain the concept of self-synchronization in reference to digital signals.

(*c*) Explain the basic difference between a hub, bridge and a switch.

3. (*a*) What is subnetting ? A network on the internet has a subnet mass of 255.255.240 What is the maximum number of hosts it can handle ?

(*b*) Give the structure of TCP Header. Discuss the purpose of six one-bit flags. 2

(*c*) Why is header checksum of an IP packet computed at every hop from source destination ?

(*a*) Describe the binary exponential back off algorithm. 3

(*b*) Explain the multimode technique used for propagation of light in optical fibres. 2

(*c*) What are the differences between Packet switching and circuit switching ? 5

4. (*a*) What is the Nyquist sampling rate for a bandpass signal with bandwidth of 300 kHz with lowest frequency as 100 kHz. 2

(*b*) A bit string needs to be transmitted at the data link layer. What is the string transmitted after bit stuffing if the original bit string is 0111101111101111110. 2

(*c*) Explain the *two* basic approaches that use the concept of pipelining at data link layer. 6

5. (*a*) What is the result of applying the following schemes on sequence 11100000000000 ? Assume that before arrival of this signal, the non-zero signal level has been positive. 4

(*i*) B8ZS

(*ii*) HDB3

(*b*) 16 bit messages are transmitted using a hamming code. How many check bits are needed to ensure that the receiver can detect and correct single bit errors ? Show the bit pattern transmitted for the message 1101001100110101. 4

(*c*) Write a short note on any *one* of the following : 2

(*i*) WWW

(*ii*) DNS.

P.T.O.