Total No. of Questions :5] *[Total No. of Printed Pages :2*

Roll No .. ..

MCA - 305

MCA. III Semester

Examination, December 2015

Computer Networks

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each questions are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) What are two reasons for using layered protocols? What is one possible disadvantage of using layered protocols?
   b) What is the baud rate of classic 10-Mbps Ethernet?
   c) Television channels are 6 MHz wide. How many bits/sec can be sent if four level digital signals are used? Assume a noiseless channel.
   d) How does sliding window protocol help to reduce congestion to an extent? Explain with suitable example.

   OR

   Compare and contrast between PCM, FDM and TDM.

Unit - II

2. a) A bit string, 0111101111101111110, needs to be transmitted at the data link layer. What is the string actually transmitted after bit stuffing?
   b) Explain the process to generate CRC with example.
   c) A 12-bit hamming code whose hexadecimal value is 0xE4F arrives at a receiver. What was the original value in hexadecimal? Assume that not more than 1 bit is in error.
   d) Describe the working of sliding window protocol with selective repeat request. How does it achieve flow control?

OR

Illustrates the calculation for a frame 1101011111 using the generator $G(x) = x^4 + x + 1$.

Unit - III

3. a) Sketch the Manchester encoding on a classic Ethernet for the bit stream 0001110101.
   b) Compare Bridge and Switch internetworking devices.
   c) Differentiate between Router and Gateway on the basis of their functionalities.
   d) Describe the frame format of 802.5 IEEE Token Ring Standard.

   OR

   Describe the frame format of 802.3 IEEE Ethernet Standard.

Unit - IV

4. a) Give two example computer applications for which connection-oriented service is appropriate.
   b) A network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts it can handle?
   c) The maximum payload of a TCP segment is 65,495 bytes. Why was such a strange number chosen?
   d) Explain the Bellman Ford Algorithm for routing in network with an example.

   OR

   Describe the process of TCP connection establishment.

Unit - V

5. a) Many business computers have three distinct and worldwide unique identifiers. What are they?
   b) Name the frames that MPEG consist.
   c) DNS uses UDP instead of TCP. If a DNS packet is lost, there is no automatic recovery. Does this cause a problem, and if so, how is it solved?
   d) Briefly describe the architecture of an E-mail system with neat diagram.

   OR

   Define the following terms:

   i) Cryptography ii) Cryptanalysis

   iii) Cryptology

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