Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.Tech(CSE)/SEM-2/CST-621/2013

2013

NEXT GENERATION INTERNET AND MULTIMEDIA

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

(All questions carry equal marks (i.e. 5). Answer total 14 questions taking minimum 6 questions from each group. All answer should be precise and with example or diagram if required)

GROUP – A

1. Describe how port address, IP address and physical address are used for transmission of data through different layers in TCP/IP protocol suits.
2. What is the requirement for classless addressing scheme ? Assume a company has 5 branches. The company is granted a block of 64 addresses with the beginning address 80.12.100.128/26. The company has decided to distribute 32 addresses for the main branch and divides the rest of addresses between the four other offices. Design the subnet.

3. Describe link state routing.

4. The routing table for router R1 is given below. Draw the topology.

1. Mask	2. Network Address	3. Next-Hop Address	4. Interface number
5. /26	6. 140.6.12.64	7. 180.14.2.5	8. M2
9. /24	10. 130.4.8.0	11. 190.17.6.2	12. M1
13. /16	14. 110.70.0.0	15. ----------	16. M0
17. /16	18. 180.14.0.0	19. ----------	20. M2
21. /16	22. 190.17.0.0	23. ----------	24. M1
25. Default	26. Default	27. 110.70.4.6	28. M0

5. Why is ICMP required ? Describe ICMP message formats in brief.

6. Explain fragmentation procedure of IP explaining the need.

7. Why TCP is byte oriented ? Why TCP is called connection oriented service ? Explain the methods.

8. How TCP handles errors during transmission of packets ? Describe all possible rules.

9. Explain DHCP with various options and transition states.

10. What is DNS ? Why is it used ? Explain the resolution methods.

11. Explain congestion avoidance mechanism of TCP.

12. What is the requirement of IPv6 ? Describe IPv6 addresses.

GROUP – B

13. Compare lossy and lossless compression technique. A series of messages is to be transferred between two computers. The message comprises the character from *A* to *F*. Analysis has shown that the probability (relative frequency of occurrence) of each character is as follows :

    a) $A = 0.16$

    b) $B = 0.25$

    c) $C = 0.3$

    d) $D = 0.08$

    e) $E = 0.1$

    f) $F = 0.11$

    g) Using Huffman coding derive the Huffman Tree and Huffman code for each.

14. Compare Rster and Vector Graphics with example. What is image resolution ? How is it related with the image size ?

15. Describe JPEG process for image compression in brief.

16. Explain briefly HSB colour model and CMYK colour model.

17. What is motion compensation ? What are the *I*, *P* and *B* frames in the context of MPEG coding standard ?

18. Define sampling, quantization related to the digitization of analog signal with suitbale diagram. An audio signal is digitized at a sampling rate of 44.1 kHz, a bit depth of 16 and in stereo mode. Calculate the space occupied by 4 minutes of the audio.

19. Describe briefly the operation of a digital CCD camera and the concept of megapixel.

20. What are the types of redundancies defined for Audio compression ? What is MP3 ?