M.Tech. Degree Examination, December 2011
Multimedia Communication

Time: 3 hrs. Max. Marks:100

Note: *Answer any FIVE full questions.*

1   a.   Define multimedia. Briefly explain the media types associated with multimedia.   **(06 Marks)**
    b.   With the help of a diagram, describe the main components of PSTN and show how a high speed modem provides multiple services in addition to basic telephony.   **(10 Marks)**
    c.   Briefly explain the following operational modes of a communication channel i) Simplex ii) Duplex   iii) Broadcast   iv) Multicast.   **(04 Marks)**

2   a.   With a neat diagram, explain the working of circuit switched and packet switched networks.   **(10 Marks)**
    b.   Briefly explain the network QOS associated with the circuit switched and packet switched networks.   **(07 Marks)**
    c.   Derive the maximum block size that should be used over a channel which has a mean BFR probability of 10^{-4}, if the probability of a block containing an error and hence being discarded is to be 10^{-1}.   **(03 Marks)**

3   a.   Explain briefly three texts that are used to produce pages of documents.   **(06 Marks)**
    b.   With the aid of the diagram, explain the principle of operation of PCM speech codec. Explain also the compression and expander characteristics.   **(10 Marks)**
    c.   Find out the time taken to transmit the following digitized images at both 64Kbps and 1.5Mbps : i) a $640 \times 480 \times 8$ VGA compatible image   ii)   a $1024 \times 768 \times 24$ SVGA compatible image.   **(04 Marks)**

4   a.   A series of messages is to be transmitted between computers over a PSTN. The messages comprise the characters, A through H. The probability of each character is as follows :
    A and B = 0.25,   C and D = 0.14,   E, F, G and H = 0.055.
    i) Use Shanon's formula to derive the minimum average number of bits / character.
    ii) Use Haffman coding to derive the codeword and prove that this is the minimum set by constructing the corresponding Huffman code tree.   **(14 Marks)**
    b.   With the aid of a diagram, identify the five main stages associated with the base line made of operation of JPEG.   **(06 Marks)**

5   a.   With the help of an encoder / decoder draw schematic diagram explain the principles of DPCM.   **(10 Marks)**
    b.   With the help of example frame sequences, explain I, P, B, and D frames and the reasons for their use.   **(10 Marks)**

6   a.   With the help of a neat diagram, explain the MPEG – 4 system architecture.   **(10 Marks)**
    b.   Discuss the significant features of JPEG – 2000.   **(05 Marks)**
    c.   Write short note on MPEG – 7.   **(05 Marks)**

7   a.   Explain four layer synchronization reference model of an multimedia applications.   **(10 Marks)**
    b.   With the aid of neat diagrams, explain the classification of logical data units.   **(10 Marks)**

8   Write short notes on :
    a.   Multimedia operating system.   b.   Multimedia in mobile networks.
    c.   Resourse and process management technique.   d.   Error resilient coding.   **(20 Marks)**

*****