Multimedia Communication VTU VTU Question Paper Set

USN | | | | | | | | | | |

10EC/TE841

Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Multimedia Communications

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. With neat diagrams, explain communication networks used to provide multi-media communication services. **(10 Marks)**

b. Determine the propagation delay associated with the following communication channels : i) a connection through a private telephone network of 1 km, ii) a connection through a PSTN of 200 km, iii) a connection over a satellite channel of 50,000 km. Assume that the velocity of propagation of a signal in the case of i) and ii) is 2×10^8 ms^{-1} and in the case of iii) 3×10^8 ms^{-1}. **(10 Marks)**

2 a. List and explain types of text used to produce pages of documents. **(06 Marks)**

b. With schematic diagram discuss audio/sound synthesizer. **(08 Marks)**

c. Derive the time to transmit the following digitized images at both 64 kbps and 1.5 Mbps : i) a 640 × 480 × 8 VGA – compatible image, ii) a 1024 × 768 × 24 SVGA – compatible image. **(06 Marks)**

3 a. Briefly discuss JPEG encoder and decoder. **(14 Marks)**

b. A series of messages is to be transferred between two computers over a PSTN. The messages comprise just the characters A through H, Analysis has shown that the relative frequency of occurrence of each character is as follows : A and B = 0.25, C and D = 0.14, E, F, G and H = 0.055. Derive code word set using Huffman coding. **(06 Marks)**

4 a. Discuss ADPCM sub-band encoder and decoder. **(12 Marks)**

b. With neat schematic, discuss MPEG-4 decoder. **(08 Marks)**

PART – B

5 a. With neat frame format, explain IEEE802.3 network characteristics. **(08 Marks)**

b. Explain LAN protocol framework. **(06 Marks)**

c. Assuming a signal propagation delay in the fiber of 5 μs per 1 km, derive the latency of the following FDDI ring configurations in both time and bits assuming a usable bit rate of 100 Mbps i) 2 km ring with 20 stations ii) 20 km ring with 200 stations iii) 100 km ring with 500 stations. **(06 Marks)**

6 a. Discuss internet networking components and protocols. **(10 Marks)**

b. Explain IPV6 header fields and format. **(06 Marks)**

c. Determine the amount of padding required in a MAC frame when transmitting an ARP/RARP message over i) an Ethernet LAN and ii) an IEEE 802.3 LAN. **(04 Marks)**

7 a. With neat schematic diagram, explain ATM protocol architecture. **(12 Marks)**

b. Discuss ATM cell formats. **(08 Marks)**

8 a. Explain TCP/IP protocol suite and inter layer address selectors. **(12 Marks)**

b. Discuss real-time transport control protocol usage. **(08 Marks)**

* * * * *

USN | | | | | | | | | | |

10EC/TE841

Eighth Semester B.E. Degree Examination, June/July 2016
Multimedia Communication

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain any two multimedia networks that provides single type of service? **(08 Marks)**

b. Which are the modes of multipoint conferencing. And explain with diagram. **(06 Marks)**

c. Define Network Quality of Service parameters. Explain packet switched network parameters. **(06 Marks)**

2 a. Derive the bit rate and memory requirements to store each frame that result from the digitization of both a 525 line system and a 625 line system assuming a 4:2:0 format. Also find the memory required to store a 1.5 hour movie/video. **(08 Marks)**

b. Explain any two types of texts in detail. **(06 Marks)**

c. Differentiate Non-interlaced and interlaced scanning. **(06 Marks)**

3 a. What are pass mode, vertical mode and horizontal modes in run length possibilities and explain the same with flow chart. **(07 Marks)**

b. Describe forward DCT, quantization block of JPEG standard. **(06 Marks)**

c. Construct Huffman table and code tree for the given characters. Relative frequency of occurrence of each character is as follows :
A and B = 0.25, and C and D = 0.14, E, F, G and H = 0.055. Also derive the set of code-words for the given characters **(07 Marks)**

4 a. Explain perceptual features of the ear and vocal tract excitation parameters. With a neat diagram, explain linear predictive coding (LPC) signal encode and decoder. **(10 Marks)**

b. Explain H.261 video compression standard with the help of macro block format frame format and GOB structure. **(10 Marks)**

PART – B

5 a. Explain in detail with diagrams LAN protocols and protocol frame work. **(10 Marks)**

b. What is a transparent bridge? With a neat diagram. Explain transparent architecture and its application example. **(10 Marks)**

6 a. Explain the operation of internet with a neat diagram of protocol components. Assuming the IP address formats, derive the range of host addresses for classes A, B and C. express the answer in dotted decimal notation and also straight decimal. **(10 Marks)**

b. Explain in detail datagram format of IPV6. **(10 Marks)**

7 a. With the help of diagram, explain broadband ATM cell formats. **(10 Marks)**

b. Explain ATM protocol architecture. **(10 Marks)**

8 a. Explain RTP and RTCP protocols. **(10 Marks)**

b. Explain TCP/IP protocol suite with a diagram. **(10 Marks)**

* * * * *

USN | | | | | | | | | | |

10EC/TE841

Eighth Semester B.E. Degree Examination, Dec.2015/Jan.2016

Multimedia Communication

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. List out the different multimedia networks and explain telephone networks and broadcast television network using cable with relevant diagrams. **(10 Marks)**

b. With neat diagram, explain multipoint conferencing modes of operation. **(07 Marks)**

c. Determine the propagation delay associated with the following communication channels given velocity of propagation for case (i) and (ii) as 2×10^8 m/s and (iii) 3×10^8 m/s.
i) a connection through a private telephone network of 1 km.
ii) a connection through a PSTN of 200 km
iii) a connection over a satellite channel of 50000 km. **(03 Marks)**

2 a. With the aid of a diagram, explain color image capture using camera and also RGB signal generation methods for the above. **(10 Marks)**

b. With the aid of a diagram, explain audio/sound synthesizer. **(07 Marks)**

c. Derive the memory required to store a 10 minute passage of stereophonic music. Assume bandwidth of music is 15 Hz through 20 kHz and Nyquist rate is 16 bits per sample. **(03 Marks)**

3 a. Explain with a neat diagram JPEG encoder. **(10 Marks)**

b. Encode the string went comprising characters with probability of e = 0.3, n = 0.3, t = 0.2, w = 0.1, • = 0.1 using arithmetic coding. **(10 Marks)**

4 a. Explain with a diagram ADPCM subband encoder and decoder. **(10 Marks)**

b. Explain with diagram H.263 error tracking. **(10 Marks)**

PART – B

5 a. With the aid of a diagram, explain transparent bridge and give an example. **(10 Marks)**

b. Explain with diagrams FDDI networking components and interface. **(10 Marks)**

6 a. Explain IP datagram/packet format and header fields. **(10 Marks)**

b. What is QoS support for internet applications? Explain the control mechanism used in each class to meet QoS requirement. **(10 Marks)**

7 a. With relevant diagrams explain two types of routing in ATM network and also explain general structure of ATM switch. **(10 Marks)**

b. Explain LAN emulation in ATM and also unicast protocol architecture with relevant diagrams. **(10 Marks)**

8 a. Explain TCP connection establishment with the aid of a diagram (only client server). **(10 Marks)**

b. With the aid of a diagram, explain congestion control and avoidance for TCP (only diagram for congestion control). **(10 Marks)**

* * * * *

USN | | | | | | | | | | |

10EC/TE841

Eighth Semester B.E. Degree Examination, June/July 2015
Multimedia Communications

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. What is multimedia? Explain its applications? **(08 Marks)**
b. With diagram explain different types of multimedia networks. **(12 Marks)**

2 a. Explain clearly different types of text data representation. **(08 Marks)**
b. With schematic diagram, explain PCM signal encoding and decoding principles. **(12 Marks)**

3 a. Explain clearly about image encoding and decoding methods with diagram. **(14 Marks)**
b. Explain Huffman coding procedure for encoding any given data. **(06 Marks)**

4 a. What is the role of DCT and quantization in video compression? **(08 Marks)**
b. Explain perceptual coding technique with diagram. **(08 Marks)**
c. Explain aspect ratio? **(04 Marks)**

PART – B

5 a. Explain the operation of token ring network. **(10 Marks)**
b. Explain the LAN protocols. **(10 Marks)**

6 a. With example explain fragmentation and reassembly in the internet. **(10 Marks)**
b. Explain clearly datagram format of IPv6. **(10 Marks)**

7 a. With the help of diagram, explain broadband ATM cell formats. **(10 Marks)**
b. Explain LAN emulation in ATM. **(10 Marks)**

8 a. Explain RTP and RTCP protocols. **(10 Marks)**
b. Explain TCP and UDP protocols. **(10 Marks)**

* * * * *

1 copy

USN | | | | | | | | | | |

10EC/TE841

Eighth Semester B.E. Degree Examination, Dec.2014/Jan. 2015
Multimedia Communication

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. With a neat diagram, explain how voice mail and teleconferencing is supported in relation with speech only interpersonal communication involving both public (PSTN/ISDN) and private network : Also, explain the role of voice mail server and audio bridge. **(10 Marks)**

b. With the aid of diagrams, explain the meaning of the following operational modes of a communication channel : i) simplex ii) duplex iii) broadcast iv) multicast v) asymmetric and symmetric. **(10 Marks)**

2 a. With the aid of diagrams, describe the following digitization formats, i) 4 : 2 : 2 ii) QCIF. For each format, state the temporal resolution, bit rate and give an example application for each format. **(09 Marks)**

b. Describe the raster scan operation associated with TV/computer monitor. **(07 Marks)**

c. Assuming the bandwidth of a speech signal is from 50 Hz through to 10 KHz and that of a music signal is from 15 Hz through to 20 KHz, derive the bit rate that is generated by the digitization procedure in each case assuming the Nyquist sampling rate is used with 12 bits per sample for the speech signal and 16 bits per sample for the music signal. Derive the memory required to store a 10 minute passage of stereophonic music. **(04 Marks)**

3 a. With a neat diagram, explain the JPEG encoder, in detail. **(10 Marks)**

b. With the aid of diagrams, define the following terms :
i) Spatial frequency
ii) Horizontal and vertical frequency components
iii) Discrete cosine transform (DCT). **(06 Marks)**

c. Explain the following :
i) Pure channel traffic
ii) Congestion. **(04 Marks)**

4 a. With the help of a neat diagram, explain LPC encoder and decoder. **(08 Marks)**

b. Explain the error tracking procedures of H·263, With neat diagram. **(07 Marks)**

c. A digitized video is to be compressed using MPEG – 1 standard. Assuming a frame sequence of I BBPBBPBBPBBI . . . . . and average compression ratio of 10 : 1(I), 20 : 1(P) and 50 : 1(B), derive the average bit rate that is generated by the encoder for NISC digitization format with $y = 352 \times 240$ and c_b, $c_r = 176 \times 120$. **(05 Marks)**

PART – B

5 a. Explain in detail, with diagrams, the token frame transmission and reception with priority operation. **(10 Marks)**

b. Explain spanning tree algorithm. **(04 Marks)**

c. Explain CSMA/ CDMAC method used in IEEE 802.3 standard. **(06 Marks)**

6 a. With the aid of an example, explain why sub-netting was introduced. Hence state the meaning of a subnet router and an address mask. **(08 Marks)**

b. Explain the operation of ARP and RARP. **(08 Marks)**

c. The administrator of a campus LAN is assigned a single class B IP address 150·10·0. Assuming the LAN comprises 100 subnets, each of which is connected to FDDI sadS$_j$f$_c$^j network, using a subnet router, define a suitable address mask for the site if the nImr.'a number of hosts connected to each subnet is 70. **(04 Marks)**

7 a. Explain ATM protocol architecture. **(10 Marks)**

b. Explain the communication access ATM network. **(10 Marks)**

8 a. Explain TGMP protocol suite. **(10 Marks)**

b. By means of a diagram, show the socket interface associated with UDP in relation to a user AD. Include in your diagram the send and receive buffers associated with the socket and the input and output buffers associated with the UDP entity. **(10 Marks)**

* * * * *

USN | | | | | | | | | | |

10EC/TE841

Eighth Semester B.E. Degree Examination, June / July 2014
Multimedia Communication

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. List the five basic of communication network that are used to provide multimedia services. Explain with a neat diagram, i) Broadcast television network ii) Integrated service digital network. **(12 Marks)**

b. Explain with neat diagram of multipoint conferencing modes and types of conferencing. **(08 Marks)**

2 a. With the aid of a diagram, explain how a color image is captured within a camera scanner using each of the following methods:
i) Single image sensor.
ii) A single image sensor with filters.
iii) Three separate image sensors. Include in your explanantions the term "photosities and 'CCD's and the role of the readout register. **(10 Marks)**

b. Derive the bit rate and the memory requirements to store each frame that results from the digitization of both a 525 line and 625 line system, assuming a 4 : 2 : 0 format. Also find the total memory required to store a 2 hour movie / video. **(10 Marks)**

3 a. Initially a dictionary containing only three characters with code as follows:

Code	String
1	X
2	Y
3	Z

Now if the input string is XYXYYXYZXYXYYX. Use LZW compression algorithm, find the output code. Also show that it is truly lossless algorithm by using LZW decoder. **(10 Marks)**

b. Explain the following with neat diagram,
i) Image / block preparation. ii) Forward DCT. **(10 Marks)**

4 a. With the help of a neat diagram, explain LPC encoder and decoder. **(10 Marks)**

b. Explain H.261 encoding formats. **(10 Marks)**

PART – B

5 a. What is transparent bridge? With a neat diagram, explain transparent bridge architecture and its application example. **(10 Marks)**

b. Explain in detail token ring network frame formats and field description. **(10 Marks)**

6 a. Explain with a neat diagram, IP adjunct protocol. **(10 Marks)**

b. Explain IPV6 datagram format. **(10 Marks)**

7 a. Explain ATM adaption layer 1 & 2 with neat format. **(10 Marks)**

b. Explain with a schematic diagram of ATM LAN. **(10 Marks)**

8 a. Explain TCP / IP protocol suite with a neat diagram. **(10 Marks)**

b. Write a short note on:
i) Real time transport protocol (RTP).
ii) Real time transport control protocol (RTCP). **(10 Marks)**

* * * * *