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10EC82

**Eight Semester B.E. Degree Examination, Dec.2014/Jan.2015**  
**Digital Switching System**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. Explain briefly the network structures used in telecommunication network. (10 Marks)
- b. With neat diagram, explain the hierarchy used in the national Public Switched Telephone Network (PSTN). (06 Marks)
- c. With neat diagram of elementary time-division multiplexing system, explain the principle of time-division multiplex transmission. (04 Marks)
- 2 a. Briefly explain the functions of a switching system. (08 Marks)
- b. With the neat block-diagram of subscribers line interface circuit, mention the functions implemented by it. (04 Marks)
- c. With neat block-diagram explain the different functions performed by stored program control switching system. (08 Marks)
- 3 a. Define traffic intensity, holding time, congestion, grade of service and occupancy. (05 Marks)
- b. Derive the expression for Grade Of Service (GOS) of a lost-call system having N trunks, when the offered traffic is A Erlangs. (10 Marks)
- c. 10 E of traffic is offered to switches that hunt sequentially over a group of trunks. Estimate the traffic carried by each of the first three trunks. (05 Marks)
- 4 a. Define grading. Explain different types of gradings. (05 Marks)
- b. Design a grading for connecting 20 trunks to switches having 10 outlets. Find the best grading. Represent the different possible gradings using grading diagram. (10 Marks)
- c. Design a three stage network for 100 incoming and 100 outgoing trunks. (05 Marks)

**PART – B**

- 5 a. With a neat diagram, briefly explain the space switch with K incoming and m outgoing PCM highways. (06 Marks)
- b. With neat diagram explain time-space-time switching (T-S-T) network. (06 Marks)
- c. With neat diagram explain the frame-alignment of PCM signals entering a digital exchange. (08 Marks)
- 6 a. With a neat diagram, explain the classification of digital switch software. (10 Marks)
- b. Write a short note on a basic call model. (10 Marks)
- 7 a. Write a short note on the interfaces of a typical digital switching system central office. (10 Marks)
- b. Write a short note on a strategy for improving software quality. (10 Marks)
- 8 a. Write a short note on digital switching system hardware architecture. (10 Marks)
- b. Write a short note on digital switching system software architecture. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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**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 1 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 network, using a subnet router, define a suitable address mask for the site if the 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)

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