Code No: **RT41045**   **R13**   Set No. 1

IV B.Tech I Semester Regular Examinations, November - 2016
ELECTRONIC SWITCHING SYSTEMS
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
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PART–A *(22 Marks)*

1. a) Discuss the advantages of automatic switching systems.   [4]
    b) Write short notes on centralized SPC.   [4]
    c) Write short note on Quantization.   [3]
    d) Define and explain-   i) Busy Hour Call Attempts/Rate
        ii) Average Holding Time   iii) Call Completion Rate   [3]
    e) Discuss about grade of service   [4]
    f) Write User-Network Interface Configuration for ISDN.   [4]

PART–B *(3x16 = 48 Marks)*

2. a) What are different features common to Manual Switching and Electronic
        Switching? List and explain in brief.   [8]
    b) A diagonal cross point matrix exchange supports 500 users. On an average 1000
        calls are put through every day. If the cross point contacts have a mean life of
        10000 breaks and makes, estimate as to how often a cross point may be replaced in
        this exchange.   [8]

3. a) Draw a centralized SPC organization and explain how it works under load sharing
        operation.   [8]
    b) What is time division switching? With the help of block diagram explain basic time
        division time switching method.   [8]

4. a) Discuss different Routing plan adopted in a Telephone network.   [8]
    b) Explain the process of inter-register signalling.   [8]

5. a) What is Traffic Engineering? Define the term busy hour, traffic intensity and grade
        of service.   [8]
    b) Give the operation of different topologies used in local area network bring out their
        advantages and disadvantages.   [8]

6. a) Explain the design of a single stage 100 line exchange with Cross Points. Draw a
        neat diagram.   [8]
    b) Discuss about Strict-sense non-blocking networks.   [8]

7. a) Explain the working of broad band ISDN.   [8]
    b) What are the principles and objectives of ISDN?   [8]

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PART–A *(22 Marks)*

1. a) Explain various functional entities. [3]
   b) Draw a neat diagram for time division switching system. [4]
   c) Compare in channel and common channel signalling schemes. [4]
   d) Explain the effect of Queues in tandem on Delay and Probability of Delay. [4]
   e) Explain the concept of call packing. [4]
   f) What are the ISDN Interfaces? [3]

PART–B *(3x16 = 48 Marks)*

2. a) Explain the operation of touch tone keypad which operates with different frequencies. [8]
   b) Explain briefly about the 3x3 and 6x6 cross bar switching. [8]

3. a) Draw the block diagram for a TS Switch and Explain various functional entities. [8]
   b) In n stage Combination switching, a trade-off between blocking probability and time delay is possible. Explain? [8]

4. a) A telephone company proposes to introduce a simplified charging scheme where charging is directly proportional to the time a user remains off hooks. Discuss the merits and demerits of such a charging scheme. [8]
   b) Explain the term Common channel signaling. State at least four advantages. [8]

5. a) Write short notes on LAN protocol architecture. [8]
   b) Define Blocking probability and GOS? [8]

6. a) Explain the design of a single stage 100 line exchange with Two Motion Selectors. Draw a neat diagram. [8]
   b) Write a brief note on Applications of gradings in a Telecommunication Switching Network. For an ideal Grading, state and explain the Erlang's grading formula. [8]

7. a) Explain the differences between Wide band and Narrow band ISDN. [8]
   b) Describe bearer, tele and supplementary services of ISDN. [8]

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Set No. 3

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Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
*****

PART–A *(22 Marks)*

1. a) Write a brief note on Switching Functions. [3]

    b) Define call congestion and time congestion. [4]

    c) State important specifications of CCITT signalling system No.6. [4]

    d) Explain the terms 'offered traffic' and 'carried traffic'. How are these traffics related in Loss Systems and Delay Systems? [4]

    e) Define Limited Availability and Full Availability. [4]

    f) What are the ISDN Channels? [3]

PART–B *(3x16 = 48 Marks)*

2. a) How are switching systems classified? Explain how a stored program control is superior to hard wired control. [8]

    b) Derive the expression for total no. of cross-points of a Three stage Strict sense non-blocking network with 'N' inlets and 'N' outlets with each primary and tertiary switch having 'n' inlets /outlets. [8]

3. a) Explain operation of Input controlled time division space switching with a neat block diagram. [8]

    b) Determine the switch advantage ratio of a three stage network with N inlets and N outlets for the cases when N=128 & 32,768. [8]

4. a) Describe about the Switching Hierarchy and Routing? [8]

    b) Draw and explain the subscriber loop systems. [8]

5. a) Explain the Packet Switched Networks with the help of diagrams. [8]

    b) Describe different traffic measurement units in Telecommunication Network. Define Erlang and CCS. How are they related? [8]

6. a) Define Graded Groups. Explain the procedure for designing a grading to Provide access to 'N' trunks from switches with availability 'k'. Which is the best grading? [8]

    b) Explain the Grade of Service of Two stage networks In the three modes of the link system. [8]

7. a) What is the basic Concept of ISDN? Explain the architecture of ISDN with neat sketch. [8]

    b) Explain different layers in ISDN Protocol. [8]

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PART–A (22 Marks)

1. a) What is manual Switching system? Explain. [3]

   b) Write a brief note on Digital switching in analog environment. [4]

   c) Explain the term Common channel signalling. [4]

   d) State and explain important parameters used to characterize Telecommunication Traffic. [4]

   e) Define Grading and Availability. [4]

   f) What is digital bit pipe? [3]

PART–B (3x16 = 48 Marks)

2. a) A 1000 line exchange is fairly folded and partly non folded. 40% of subscribers are active during peak hour. If the ratio of local to external traffic is 4:1, estimate the number of trunk lines required. [8]

   b) Draw the block diagram for a Three stage Switching matrix with 'N' inlets and 'N' outlets with 'k' number of switches in the Second stage and each inlet-outlet group of size 'n'. Calculate total no. of cross-points in terms of N, n and k.
   What is the value of 'k' for a Three stage Switching matrix to be non-blocking? [8]

3. a) With examples explain the time division switching and combination switching. [8]

   b) Draw the block diagram for a STS Switch and Explain various functional entities. [8]

4. a) Draw and explain block schematic diagram of CCITT signalling system No.7. [8]
   b) Explain the terms and draw neat diagrams of
      i) Associated signalling   iii) Quasi-associated signalling
      ii) Non-associated signalling iv) Signal Transfer Point. [8]

5. a) State and explain formulae for Probability of Delay, Mean length of the queue, Mean Delay. [8]

   b) Explain how the End to End Blocking Probabilities in a large network are calculated with clearly stating assumptions and sources of error. [8]

6. a) Explain the Grade of Service of Two stage networks In the mode 1 and mode 2 of the link system. [8]

   b) Draw neat diagram for links in a Two Stage Switching Network with 64 by 8 and 8 by 4 switches in a 64 by 16 concentrator. Draw corresponding Grading Diagram. [8]

7. a) What is the criterion for defining ISDN Standards? What are those standards? Define the two ISDN interfaces. [8]
   b) Explain the Numbering and Addressing formats of ISDN with examples. [8]