

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: BE  
BRANCH: ECE**

**SEMESTER : VII  
SESSION : MO/19**

**SUBJECT: EC7205 TELECOMMUNICATION SWITCHING SYSTEM & NETWORKING**  
**TIME: 3.00Hrs.**

**FULL MARKS: 60**

**INSTRUCTIONS:**

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
  2. Candidates may attempt any 5 questions maximum of 60 marks.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) In a simplex telephone circuit with one way communication, discuss the operation of carbon microphone and derive the instantaneous microphone current expression. [2]
- Q.1(b) Explain with suitable diagram, the various control functions in a common switching system. [4]
- Q.1(c) Explain any three design considerations to avoid talk-off problem. Discuss the different talk-off problems found in a touch tone dial telephone. Explain the 'choice-of-frequency' design consideration to avoid talk-off problem. [6]
- Q.2(a) Discuss the load sharing configuration. What is ED? [2]
- Q.2(b) Given that MTBF = 2000 hours and MTTR = 4 hours, calculate the unavailability for single and dual processor systems. [4]
- Q.2(c) Derive the expression for the blocking probability of a three stage network following Lee's approach. [6]
- Q.3(a) Explain, what is time multiplexed space switching? [2]
- Q.3(b) Calculate the number of trunks that can be supported on a time multiplexed space switch, given that (a) 32 channels are multiplexed in each stream, (b) control memory access time is 100 ns, (c) bus switching and transfer time is 100 ns per transfer. [4]
- Q.3(c) Explain memory-controlled time division space switch with suitable diagram. [6]
- Q.4(a) In a group of 20 servers, each is occupied for 40 minutes in an observation interval of two hours. Calculate the traffic carried by the group. [2]
- Q.4(b) Over a 20 minute observation interval, 40 subscribers initiate calls. Total duration of the calls is 4800 seconds. Calculate the load offered to the network by the subscribers and the average subscriber traffic. [4]
- Q.4(c) Derive the expression for the blocking probability in Erlang traffic. [6]
- Q.5(a) State any four conceptual principles on which ISDN is based on. [2]
- Q.5(b) Mention the function of facsimile system. Discuss the coexistence of ISDN with other networks. [4]
- Q.5(c) Explain with diagram layered protocol architecture of ISDN. Also explain transmission channels in ISDN. [6]
- Q.6(a) Differentiate between Inchannel and Common channel signalling. [2]
- Q.6(b) Discuss the four levels cable hierarchy for subscribers' loops. [4]
- Q.6(c) What is an Echo? Explain how it can be suppressed with an echo-suppressor. [6]
- Q.7(a) What are the two types of sub layer used in ATM adaptation layer? [2]
- Q.7(b) Explain the cell structure of ATM and discuss the UNI/NNI interface briefly. [4]
- Q.7(c) Why ATM is so efficient? Discuss the ATM protocol structure briefly. [6]

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