1. a) With the help of a diagram, explain the operation of director exchange.
   b) Explain General Trunking diagram of a telephone exchange. [15]

2. a) Obtain the expression for second Erlang distribution.
   b) Derive the expression for portability of delay and finite queue capacity. [15]

3. a) Explain traffic capacity and applications of gradings.
   b) Design a two stage switching network for connecting 200 incoming trunks to 200 outgoing trunks. [15]

4. a) Discuss the grade of service of time division switching networks.
   b) Explain the operations of synchronization networks. [15]

5. Explain call processing functions. Also draw signal exchange diagram and state transition diagram of a local call. [15]

6. Explain the following signaling techniques:
   i) Inter register signaling
   ii) Common channel signaling. [15]

7. a) Discuss the traffic capacity of circuit switched and packet switched networks.
   b) Explain statistical multiplexing techniques. [15]

8. Write the following:
   i) Integrated services digital networks (ISDN).
   ii) Intelligent networks. [15]
TELECOMMUNICATION SWITCHING SYSTEMS
(ELECTRONICS AND COMMUNICATIONS ENGINEERING)

Time: 3 hours

Answer any five questions
All questions carry equal marks

Max. Marks: 75

1. a) Draw Trunking diagram of a 10,000 line step by step exchange and explain its operation.
   b) Explain the operations of a single and multistage cross bar switch. [15]

2. Explain the following terms:
   i) Unit of traffic
   ii) Congestion
   iii) Traffic measurement. [15]

3. a) Design a three stage network for connecting 100 incoming trunks to 100 outgoing trunks.
   b) What is grade of service? Obtain grade of service for three stage and four stage networks. [15]

4. a) Explain the principle of operation space division and time division switches.
   b) What is concentrator? Explain it with suitable diagram. [15]

5. Explain the architectures of stored program control. [15]

6. Discuss about the following signaling techniques:
   i) In band signaling
   ii) Out band signaling
   iii) PCM signaling. [15]

7. a) Explain the modes of operation of Bus networks.
   b) Give the frame format of Ethernet frame. [15]

8. Write a brief note on:
   i) Analog networks

---ooOoo---
1. a) Compare message switching and circuit switching.
   b) What is register-translator-sender? Explain. [15]

   a) During the busy hours, 1200 calls were offered to a group of trunks and six calls were lost. The average calls duration was 3 minutes find:
   i) The traffic offered
   ii) The traffic carried
   iii) The traffic lost
   iv) The grade of service
   v) The total duration of periods of congestion

   b) On average, one call arrives every 5 sec. During a period of 10 seconds, what is the probability that:
   i) No call arrives?
   ii) One call arrives?
   iii) Two calls arrive?
   iv) More than two calls arrive? [15]

3. What is grade of service? Obtain grade of service of two stage, three stage and four stage networks. [15]

4. a) Explain time multiplexed space switching.
   b) Describe three stage combination switching. [15]

5. a) Explain the operation of common control system.
   b) Discuss reliability, availability and security with reference to switching systems. [15]

6. a) List out the advantages of common channel signaling.
   b) Explain CCITT No. 7 signaling system with its block schematic. [15]

7. a) Distinguish between X.25 and frame relay networks.
   b) List out the features of ATM networks. Explain the principle of operation of ATM switch. [15]

8. Write notes on:
   i) Private Networks.
   ii) Automatic alternative routing. [15]
MODEL PAPER – 4

B. Tech IV Year I Semester Examinations, Nov/Dec - 2012
TELECOMMUNICATION SWITCHING SYSTEMS
(ELECTRONICS AND COMMUNICATIONS ENGINEERING)

Time: 3 hours
Answer any five questions
All questions carry equal marks

Max. Marks: 75

1. a) What are the functions of switching systems? Explain.
   b) Explain the operation of strowger step by step system. [15]

2. a) Describe the mathematical model of the traffic offered to telecommunication system.
   b) Obtain grade of service of lost call system having N trunks. [15]

3. a) Give the design equation of progressive gradings.
    b) Obtain the grade of service of two stage and three stage networks. [15]

4. a) Explain the operation of space division and time division switches.
    b) What is a concentration? Explain. [15]

5. a) Explain call processing function.
    b) Describe processor configuration of SPC architecture. [15]

6. Discuss the following signaling mechanisms:
   i) Out-band signaling   ii) In band signaling
   iii) PCM signaling     iv) Inter register signaling. [15]

7. a) What is statistical multiplexing? Explain.
    b) Compare bus and ring networks. [15]

8. Write a brief note on:
   i) Cellular radio networks

--ooOoo--