B.E / B.Tech (Full Time) DEGREE EXAMINATION, APRIL / MAY. 2014

ELECTRONICS AND COMMUNICATION ENGINEERING

SIXTH SEMESTER

EC9032 DIGITAL SWITCHING AND TRANSMISSION

(REGULATION 2008)

Time: 3 hours   Maximum Marks : 100

Answer All Questions

Part – A (10 x 2 = 20 Marks)

1. A fully connected network supports full duplex communication using unidirectional links.Compute the total number of links in such a network with n nodes.
2. What is Binary N-zero substitution?
3. Why is a readily (hardware) implementable FIFO queuing operation not always employed in ATM switching?
4. Sketch a time switch module with output associated control.
5. Define section,line and path.
6. Is cladding strictly essential for the construction of an optical fiber?Why?
7. Wide-bandwidth transmission on copper pairs installed for analog POTS service is complicated by several factors. State any two factors.
8. Define BRI and PRI.
9. State the relationship between Markov process and Birth-Death process.
10. Cite an example each for the situations(i) When a Loss system will behave like a Delay system and(ii)When a Delay system will behave like a Loss system.

Part – B (5 x 16 = 80 Marks)

11. (i) With a basic block diagram, describe a communication system and its governing principles.   (10)

    (ii)Compare Synchronous and Asynchronous transmission   (6)

12. a(i) Determine the average transmission capacity required to retransmit 50 kilobyte messages if they are transmitted intact across a single transmission link with a BER of 10^{-6}.What is the average retransmission capacity required if the messages are packetized into 2-kilobyte packets.(Ignore the size of the packet headers.)   (6)

    (ii)Describe SONET/SDH.   (10)

(OR)

12. b(i)A long haul single mode optical fiber system operating at a wavelength of 0.8µm has the following parameters: Mean power launched into the fiber = - 3 dBm, Fiber attenuation= 2 dB/km, Splice loss = 0.3 dB/splice, Connector loss = 1 dB/connector, Receiver sensitivity = -55 dBm and Required safety margin = 9 dB. Determine the maximum possible link length without repeaters, if the link is formed by splicing 1-km fiber lengths. Assume that the connectors are used only at the ends.   (6)

b(ii)Elaborate on the various multiplexing schemes. To accommodate variable rate users,what are the multiplexing options available? Substantiate **(10)**

13. a(i) Describe ISDN local loop. **(12)**

(ii)Determine the maximum loop length of a ping-pong transmission system utilizing 8-kHz data bursts of 50 µsec duration in each direction.Assume the velocity of propagation is one-third the speed of light. **(4)**

(OR)

13.bElaborate on ADSL and Fiber in the Loop.

14. a(i)Compare ATM switching and synchronous TDM. **(4)**

(ii)Describe WDM. **(6)**

(iii)Derive the expression corresponding to the number of crosspoints required in in a three stage space switch. **(6)**

(OR)

14. b(i)Discuss about the recent advances in switching techniques. **(12)**

(ii)Determine the implementation complexity of the TS switch when the number of TDM input lines N=80 and each input line carries 24 channels. **(4)**

15. a(i) Derive Erlang C formula. **(12)**

(ii)In an office,calls arrive at a PABX at the rate of 30 per hour during office hours.How much time is expected to elapse before the first call arrives at the exchange after the office opens in the morning? **(4)**

(OR)

15. b(i)While employing Negative Exponential Interarrival times, what are the assumptions made? **(4)**

(ii)A rural telephone exchange normally experiences four call originations per minute. What is the probability that exactly eight calls occur in an arbitrarily chosen interval of 30 seconds? **(4)**

(iii)Compare and contrast the salient features of Loss systems and Delay systems.(8)