B 295

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

Eighth Semester

Electronics and Communication Engineering

EC 054 — TELECOMMUNICATION SWITCHING AND NETWORKS

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. While doing the analysis using lost calls returned (LCR) model, what are the assumptions made regarding the nature of the returning calls?

2. What is BORSCHT?

3. What is the need for ISDN?

4. 'Numbering plan in a telephone network must be independent of call routing'? Why? Explain.

5. What is plesiochronous multiplexing?

6. Why is ISO-OSI architecture based on seven layers (not on 5 or 9 layers say, for example)?

7. Conventionally telephony makes use of circuit switching. Is it resource efficient? Why? Explain.

8. What is the need for combination switching?

9. What is CDMA?

10. What is the significance of SS7 protocol?

PART B — (5 × 16 = 80 marks)

11. (i) A switching system serves 10,000 subscribers with a traffic intensity of 0.1 Erlang per subscriber. If there is a sudden spurt in the traffic, increasing the average traffic by 50%, what is the effect on the arrival rate? (4)

(ii) In a telephone system, there are 20 servers and 100 subscribers. On an average there are 10 busy servers at any time. The probability of all servers being busy is 0.2. Calculate the grade of service assuming (1) Erlang traffic (2) Engest traffic. (4)

(iii) Discuss in detail about lost calls held system. Give an example of LCH system. (8)

12. (a) (i) Calculate the number of trunks that can be supported on a time multiplexed space switch, given that 32 channels are multiplexed in each stream, control memory access time is 100 ns and bus switching and transfer time is 100 ns per transfer. (3)

(ii) Calculate the access time of the memory modules in parallel in/serial out time switch using 64 input and 64 output streams with each stream multiplexing 32 channels. (3)

(iii) Discuss in detail about time division space switching and time division time switching. (10)

Or

(b) (i) A circuit switched connection involves 5 switching nodes. Each node takes 2 seconds and 0.2 second for establishing and releasing connections respectively. If the data transfer rate is 2400 bps compute the data transfer time for a message that is 300 bytes long. (3)

(ii) Discuss in detail about circuit switching and store and forward switching. (10)

(iii) List out the differences between voice and data traffic. (3)

13. (a) (i) A CSMA/CD bus spans a distance of 1.5 km. If the data rate is 5 Mbps, what is the minimum frame size? (3)

(ii) "Connection oriented service is modelled after the telephone system, where as connectionless service is modelled after the postal system". Explain. (3)

(iii) Describe in detail about ISO-OSI architecture. (10)

Or

(i) (i) Consider a fibre optic token ring with a physical length of 100 km, an operating speed of 100 Mbps and having 100 stations each introducing 1 bit delay. Compute the maximum ring utilisation if the free token were to be reintroduced after the first bit arrives at the source. Assume a frame length of 1000 bits, and also assume that the stations are equally spaced. (4)

(ii) Discuss in detail about ATM networks. (8)

(iii) What are CSMA/CD and CSMA/CA schems? Compare and contrast. (4)

14. (a) (i) In a cellular communications, a region is geographically divided into cells which are hexagonal in shape. Why? (2)

(ii) What is the rationale behind specifying different functional groupings and interfaces in ISDN? Do you think U interface is relevant to India? Why? (4)

(iii) Describe in detail about subscriber loop system and their characteristics. (10)

Or

(b) (i) Describe in detail about SONET/SDH standard. (10)

(ii) Discuss about compression techniques used in facsimile transmission. (6)

15. (a) (i) In a 1000 line exchange using Strowger scheme, the number range 000–299 is allotted to business subscribers. Forty percent of these subscribers in each group of 100 are active during peak hours. The number range 300–999 is allotted to domestic connections. Ten percent of the domestic subscribers are active in each group at any time. Estimate the total numbers of final selectors required. (3)

(ii) In an English speaking country, a long distance caller hears the voice announcement 'Lines in this route are busy. Please try after sometime'. Is it possible for him to determine which segment is busy? Compare the situation in a multilingual country like India. (3)

(iii) Discuss in detail about distributed SPC. Describe the three level processing functions. (10)

Or