Printed Pages : 4 EEC-702

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0305 Roll No.

B. Tech.

(SEM. VII) EXAMINATION, 2008-09

ELECTRONICS SWITCHING

Time : 3 Hours] *[Total Marks : 100*

Note : *(1) Attempt all questions.*
(2) All questions carry equal marks.
(3) In case of numerical problems assume data wherever not provided.
(4) Be precise in your answer.

1 Attempt any **four** parts of the following :

(a) Give the classifications of switching systems. Compare manual exchange and automatic exchange.

(b) Give the classification of switching techniques used in PSTN and explain in brief.

(c) Why is Electronic Exchange alone suitable for digital telephony ? Explain.

(d) What do you understand by blocking and nonblocking model of telephone traffic ? Draw NXN three stage switching network.

(e) Draw the block diagram showing the organization of crossbar exchange and briefly explain the operation.

(f) What do you mean by baud rates and bit rates ? What is the maximum data rate achievable, if a binary signal is sent over a 3 kHz channel whose S/N ratio is 40 dB.

2 Attempt any two parts of the following :

(a) In a TS switch, M = 128, N = 16 and the number of subscribers connected to the system is 0.1 MN. Determine the blocking probability of the switch if :

(i) All the subscribers are active at the same time.

(ii) Only 50% of the subscribers are active simultaneously.

(b) Explain the working of a basic time division time switching system. How a time space time switch works ? Discuss the necessity of combination switching.

(c) An STS network has ten incoming highways, ten outgoing highways and ten time switch links. The highways convey 32 PCM time slots. The average occupancy of incoming PCM channels is 0.7 E.

(i) Derive an equivalent space division networks.

(ii) Estimate the blocking probabilty.

(iii) Estimate the grade of service when an incoming call must be connected to a selected outgoing highway but may use any free channel on it.

3 Attempt any four parts of the following :

(a) The traffic statistics of a company using a PABX indicates that 180 outgoing calls are initiated every hour during working hours. Equal number of calls comes in. Each call lasts for 200 sec. on an average. If the GOS required is 0.05, determine the number of lines required between the PABX and the main exchange.

(b) What is renewal process or pure birth process. Find out the equation which governs the dynamics of renewal process.

(c) Compare loss system and delay system with appropriate examples. In limit all delay system behaves like loss system. How ?

(d) 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.

(e) Find the delay in sending an X bit message over a K hop path in a circuit switched network. The circuit setup is 'S' second, the propagation delay is D sec. per hop, the packet size is P bits and the data rate is B bps.

(f) What is meant by call congestion and time congestion in a telephone network ? During a busy hour, 1400 calls were offered to a group of trunks and 14 calls were lost. The average call duration has 3 minutes. Find (i) GOS (ii) The total duration of period of congestion.

4 Attempt any **two** parts of the following :

(a) Explain Centralized SPC with the concept of dual processor architecture modes and distributed SPC with levels processing used in dual chain distributed control.

(b) Summarize the different types of signaling techniques. Explain CCS (Common Channel Signalling).

(c) (i) Explain the X-25 interface with neat diagram.

(ii) Explain the important features and frame structure of HDLC.

5 Attempt any **four** parts of the following :

(a) Explain the call establishment / release process in ATM using Virtual channel and Virtual paths.

(b) Draw TCP / IP reference model. How IP addressing is achieved ? With reference to IP, explain the address Resolution Protocol.

(c) Draw a 16 × 16 Banyan Switching fabric. Where is header Translation done in a multicast ATM switch ?

(d) A link network is required to connect 64 incoming trunks to 64 outgoing trunks. All its switches are to be of equal size and 64 links are to be provided at each stage. Suggest a suitable size of switch to use in a two stage network. How many cross points does each contain ?

(e) Write a short note on Address structure of ISDN and ISDN service characterization.

(f) Design a three stage networks for 100 incoming trunks and 400 outgoing trunks.

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