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Total Number of Pages: 02

B.TECH
PEEC5417

7th Semester Regular / Back Examination 2015-16
DIGITAL SWITCHING AND TELECOMMUNICATION NETWORKS

BRANCH: CSE, IT

Time: 3 Hours

Max Marks: 70

Q.CODE: T580

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

- Q1** Answer the following questions: **(2 x 10)**
- a) If the signal input to an amplifier is 0 dBm, what is the power output in mW if the gain of the amplifier is 30 dB?
 - b) In a 50 line folded network, how many switching elements are required for non blocking operation?
 - c) A subscriber makes five phone calls of three minutes, four minutes and five minutes duration in a one-hour period. Calculate the subscriber traffic in erlangs.
 - d) A rural telephone exchange four call originations per minute. What is the probability that exactly eight calls occur in an arbitrarily chosen interval of 30 seconds?
 - e) If the signal-to-thermal noise ratio of a telephone channel is about 30dB and band width is 3KHz, then calculate the maximum bit rate of that channel
 - f) An antenna has a directive gain of 18dBi, a radiation efficiency of 85% and a feeder loss of 3DB. Determine the power gain.
 - g) 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.
 - h) What are the differences between Voice traffic & Data traffic?
 - i) What are the responsible factors for the development towards ISDN?
 - j) What are the various parameters relating to digitized voice and data traffic in the integration of voice and data?
- Q2**
- a) A 1000 line exchange is partly folded and partly non folded. 40% of the subscribers are active during peak hour. If the ratio of local to external traffic is 4:1, estimate the number of trunk lines required. **(5)**
 - b) Write the differences between Single stage and Multi stage networks in telecom switching network. **(5)**

- Q3 a)** A three stage switching structure supports 128 inlets and 128 outlets. It is proposed to use 16 first stage and third stage matrices. **(5)**
- i) What is the number of switching elements in the network if is non blocking.
- ii) At peak periods, the occupancy rate of an inlet is 10%. If the number of switching elements required for non blocking operation is reduced by a factor of 3, what is the blocking probability of the network?
- b)** Describe in brief about the time multiplexed space switching with neat diagram. **(5)**
- Q4 a)** The power required at a receiving microwave antenna is -60dBw. The transmitting and receiving antenna have a power gain of 40dB each. Determine the required transmitter power if the carrier frequency is 4 GHz and the distance between the antenna is 48km. find out the free space loss (FSL), if the distance between the antenna is doubled. **(5)**
- b)** Calculate the maximum access time that can be permitted for the data and control memories and compare it with that of a single-stage space division switch. an a TSI switch with a single input and single output trunk multiplexing 1250 channels. Also, estimate the cost of the switch **(5)**
- Q5 a)** 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 the servers being busy is 0.2. Calculate the GOS assuming **(5)**
- (i) Erlang traffic
- (ii) Engest traffic
- b)** State and explain B-D process in telecom switching system using state transition diagram **(5)**
- Q6 a)** What is return loss? Define it in terms of power and signal voltage. Calculate the return loss of two perfectly balanced network **(5)**
- b)** Distinguish between Inchannel and Common Channel signalling Explain in details about the different type of signalling techniques used in telecom network. **(5)**
- Q7 a)** Describe in brief about ISDN architecture with suitable neat diagram. **(5)**
- b)** Give the brief description about the various level of Signalling in ISDN. **(5)**
- Q8** Write short notes on any two: **(5 x 2)**
- a)** Coaxial Cable Transmission
- b)** Lost calls returned (LCR)
- c)** Broadband ISDN
- d)** Single Stage Vs Multistage switches.