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M.Tech. (ECE) (2016 Batch) (Sem.–1)

ADVANCED COMMUNICATION SYSTEM

Subject Code : MTEC-103

M.Code : 74148

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

1. a) Assume that the input to a DM is $0.1t^8 - 5t + 2$ .The step size of the DM is 1V. The sampler operates at 10 samples/s. Sketch the input waveform, the delta modulator output and the integrator output over a time interval of 0 to 2 s. Denote the Granular noise and slope over load regions. 15

   b) Draw and explain Block diagram of Digital Communication System. 5

2. a) For $\frac{\pi}{4}$ QPSK signaling, Calculate the carrier phase shifts when the input data stream is 10110100101010, where the left most bits are first applied to the transmitter. Find the absolute band width of the signal if r = 0.5 raised cosine -roll off filtering is use and the data rate is 1.5 Mbits/s. 10

   b) A CDMA mobile measures the signal strength from the base as –100 dBm. What should the mobile transmitter power be set to as a first approximation 5

   c) How does GSM handle handoff requests from base to mobile? 5

3. a) Explain the Architecture of optical transport network. 10

   b) Describe what a Satellite link budget is and how it is used? 10

4. a) An earth station receiving system consist of a 20dB gain antenna with $T_{AR} = 80K$, an RF amplifier $G_a = 40$dB and $T_e = 30$K and a down converter with $T_e = 15{,}000$K. What is the over all Effective input noise temperature of the receiving system? 10

   b) Write a note on Link management protocols. 10

5. a) Draw the signal space representation of QPSK and BPSK signals. 10

   b) Draw QPSK wave forms for the Binary sequence 00110100. 10

6. a) Explain frequency reuse and cell splitting in mobile radio. Why they are required? 10

   b) Write a note on Digital transmission and transmission impairments. 10

7. a) A PCS cellular site base station operates with 10W into an antenna with 18 Db gain at 1800 MHz the path loss reference distance is d_0 = 0.25 miles, X_{dB} = 0 and PCS antenna has 0 dB gain. Find the received power in dBm at the output of the base station antenna where PCS phone when the PCS phone is located at distance of 1 mile, 2 miles, 5 miles and 10 miles from BS if the path loss exponent is n = 2, n = 3,n = 4. 10

   b) What is meant by a logical channel and how is the control channel divided into logical channels in TDMA system? 10

8. Write a note on following :

   a) SONET 10

   b) VSAT 10

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.