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B. Tech
CPEC 5308

Seventh Semester Examination – 2008

COMMUNICATION ENGINEERING

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory
and any **five** from the rest.*

*The figures in the right-hand margin
indicate marks.*

1. Answer the following questions : 2×10
- (a) Give the Fourier transform of $e^{-t}, t \geq 0$.
- (b) A signal exhibits an amplitude swing of ± 3.5 V. It is quantized into 7 levels. Find the step size and hence the quantization error.

P.T.O.

- (c) What are the objectives of a clock in a digital system ?
- (d) What is the 'Code' aspect of PCM ?
- (e) What is the impulse response of an ideal low pass filter ? Sketch it.
- (f) Give a block schematic of generating a SSB signal from a DSBSC signal.
- (g) Write two advantages of a FSK signal.
- (h) What is the practical value of the noise figure of a two-port network ? Why ?
- (i) Give two typical bands used in satellite communication. Why the uplink and down link frequencies are different ?
- (j) How diversity is useful in a Cellular Communication System ?

2. Derive the PSD of a NRZ data stream. Sketch it and state its salient features. 10
3. Derive the Fourier transform of a triangular wave of amplitude A volt and duration T sec from a similar rectangular pulse by using certain properties of Fourier transform. Sketch the spectrum. Why does it look so ? 10
4. Derive the output signal power in a PCM transmission system. Hence find out the signal to quantization noise ratio. 8+2
5. (a) How the equivalent noise temperature of a system in cascade is calculated ? What is its practical implication ? 5
- (b) Discuss the radiation pattern of a dipole antenna. Explain how does a dipole act as an antenna ? 5

6. (a) Compare a LED and a LASER as optical sources. 5
- (b) Discuss the principle and operation of any photodetector. 5
7. (a) Write down the salient features of a satellite communication system. Explain the working of a typical transponder. 6
- (b) What is fading ? What is its cause ? Write two remedies for it. 4
8. (a) Draw and explain any AM demodulator. 5
- (b) Discuss any two types of antennas as used in a satellite communication system. 5