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

PAPER ID : 3085 Roll No.

B. Tech.

(SEM. V) ODD SEMESTER THEORY EXAMINATION 2010-11

PRINCIPLE OF COMMUNICATION

Time : 3 Hours *Total Marks : 100*

Note : Attempt **all** questions. All questions carry equal marks.

1. Attempt any **four** out of the following : **(5×4=20)**
   (a) What is Vestigal side band and how is it different from SSB transmission ?
   (b) Why over modulation is undesirable in amplitude modulation system ?
   (c) Compare the features of AM/FM and PM signal.
   (d) State the channel capacity theorem.
   (e) Draw the plot for total power transmitted versus carrier power of an AM signal and give your comments briefly.
   (f) What is the function of Noise limiter ?

2. Attempt any **four** out of the following : **(5×4=20)**
   (a) A modulating signal $5 \cos 2\pi 15 \times 10^3 t$ angle modulates a carrier $A \cos(\omega_c t)$. Find the modulation index and bandwidth for (i) F.M. system, (ii) P.M. system.
   (b) Explain the detection of F.M. signal by Foster Sealy discrimination method. Give suitable phasor diagram.
   (c) What is effect of modulation index β, in the spectrum of frequency modulation ? Hence explain the significance of Carson's rule in B.W. of F.M. signal.

(d) Explain the demodulation technique Pulse width modulation and Pulse modulation.

(e) Given the spectral analysis of PAM, PWM and PPM signal. Compare SNR for such pulse analog modulation system.

(f) Compare the F.D.M. and T.D.M. technique.

3. Attempt any **two** out of the following : **(10×2=20)**

(a) Explain the different types of noise in detail.

(b) Distinguish between Narrow band F.M. and Wide band F.M. with their basic equations.

(c) Write short notes on external noise versus internal noise.

4. Attempt any **two** out of the following : **(10×2=20)**

(a) What is narrow band noise and how it is represented mathematically ?

(b) Write short notes on amplitude modulated system versus angle modulated system.

(c) Explain the concept noise triangle with respect to frequency modulation.

5. Attempt any **two** out of the following : **(10×2=20)**

(a) Derive the expression for the addition of noise due to several amplifier in cascading.

(b) Given the method for generation of AM DSBSC signals. How will you demodulate such signals ? Give suitable block/functional diagram with necessary mathematical analysis.

(c) What is mutual information ? Give any three properties. State and explain Shanon's source coding theorem. How it helps in removing redundancy of source information ?