(2) Attempt it all five questions.
(3) Assume suitable data if necessary.

1. Answer the following : 20

(a) Compare A. M. with F.M.
(b) List the advantages of digital modulation techniques
(c) State and explain sampling theorem
(d) Explain the term double spotting
(e) State the need for single side band modulation techniques.

2. (a)Explain FET based Balanced modulator. 8
   (b)Write a rote on pulse code modulation techniques. 8
   (c)State and explain any four characteristics of a radio receiver 4

3. (a) An AM carrier is modulated with an audio signal given by : 8
m(t)= 0.2 sin (w,(0+ 0.5 as w2(t))
where f1= 500 Hz and f2= 1000 Hz
The peak amplitude of the carrier signal AO = 10 volts and the carrier frequency = 50 Hz.
Assume that the AM signal is fed into 50 Q load.
(i) Evaluate and sketch the spectrum of AM wave
(ii) Calculate the modulation Index
(iii) Find the average power of the AM wave
(iv) Find the power carried by the sidebands.
(b)Sketch the circuit and explain the working of Foster-Seeley discriminator. Give phasor
diagrams for - 12
(i)   fin = fc(ii)   fin > fc(iii) fin < fc.
4.(a)Compare the following : 12
(i) Delta modulation with Adaptive Delta modulation
(ii) Frequency modulation with Phase modulation
(iii) PCM with DPOM
(b) Explain in brief the generation and detection of PAM signals. 8
5.(a) State the explain sampling thorem. What is its limitations ? Develop the concept of
aliasing when does it occur ? 8
(b) Draw the block diagram of BPSK receiver, show its out-put waveforms and explain its
working in detail 12

6.(a)Write a short note on TDM 8

(b) Describe the following terms : 8
(i)   Virtual height
(ii)   Critical frequency
(iii) Maximum usable frequency
(iv) Skip Distance.

(c)Write a note on NOISE TRIANGLE. 4

7. Write notes on :   20
(a) Vestigial sideband modulation techniques
(b) Delayed AGO and simple AGC
(c) Choice of intermediate frequency for a radio receiver
(d) Companding Technique.