(REVISED COURSE)

(3 Hours)　　　　　　　　　　　　　　　**[Total Marks : 100**

N.B. (1) Question No. **1** is **compulsory.**
　　 (2) Attempt in **all five** questions.
　　 (3) Assume suitable **data** if **necessary**.

1. Answer the following :—　　　　　　　　　　　　　　　　　　　　　　　**20**
　　 (a) Compare A.M. with F.M.
　　 (b) What is companding ?
　　 (c) List the advantages of digital modulation techniques.
　　 (d) Choice of intermediate frequency for a radio receiver.
　　 (e) Delayed AGC and simple AGC.

2. (a) Define and describe independent side band system.　　　　　　　　　　**8**
　　 (b) Write a short note on TDM.　　　　　　　　　　　　　　　　　　　　　**8**
　　 (c) State and explain any four characteristics of a radio receiver.　　　　**4**

3. (a) Sketch the circuit and explain the working of Foster-Seeley discriminator. Give phasor **12**
　　　　 diagrams for—
　　　　　 (i) fin = fc
　　　　　 (ii) fin > fc
　　　　　 (iii) fin < fc
　　 (b) Explain in brief the generation and detection of PAM signals.　　　　**8**

4. (a) Explain with circuit diagram, collector modulated class 'C' transistor amplifier. **10**
　　　　 What are the advantages of collector modulation over base modulation ?
　　 (b) Explain the concept of noise triangle. What is Pre-emphasis ? Why is it used ? **10**
　　　　 What is de-emphasis ? Explain both with the help of circuit diagrams.

5. a) Explain any one method of generating SSB.　　　　　　　　　　　　　　**8**
　　 b) Explain Adaptive delta modulation technique by comparing the same with delta **8**
　　　　 modulation.
　　 c) Write a brief note on the direct method of FM generation.　　　　　　**4**

6. a) Explain the working of a balanced modulator.　　　　　　　　　　　　**8**
　　 b) State and explain sampling theorem. Develop the concept of aliasing. When does **6**
　　　　 it occur ?
　　 c) For a receiver with IF and RF frequencies of 455 KHz and 800 KHz respectively, **6**
　　　　 determine—
　　　　　 (i) The local oscillator frequency.
　　　　　 (ii) Image frequency.
　　　　　 (iii) Image frequency rejection for a Q of 70.

7. Write short notes on any **four** :—　　　　　　　　　　　　　　　　　　　**20**
　　 a) Ground wave propagation.
　　 b) Vestigial side band modulation techniques.
　　 c) Various analog pulse modulation techniques.
　　 d) Expression for FM wave and use of Bessel's functions
　　 e) Selectivity, sensitivity, fidility, tracking and alignment.