



(3 Hours)

Total Marks : 80

N.B. (1) Question No. 1 is compulsory.

(2) Attempt any three questions out of remaining five.

(3) Figures to the right indicate full marks.

(4) Assume suitable data if required and mention the same in answer sheet

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1. Solve any four 20
- (a) Modulation Index for AM should be less than one. Justify/Contradict.
 - (b) What is aliasing? How it can be prevented?
 - (c) Why AGC is required in radio receivers?
 - (d) Justify, why FM is more immune to noise?
 - (e) Define noise figure and noise factor.
2. (a) State and prove sampling theorem for low pass bandlimited signals. 10
- (b) One input to AM modulation is 800 KHz carries with an amplitude of 10 Vp. The second input is 10KHz modulating signal that is of sufficient amplitude to cause a change in o/p wave of $\pm 5.5V_p$. Determine. 10
- i) Upper and lower side frequency
 - ii) Modulation co-efficient and percent modulation
 - iv) Draw o/p frequency spectrum
 - v) Draw modulated wave showing maxima and minima of waveforms
3. (a) Explain the operation of Foster seeley discriminator with the help of circuit diagram and phasor diagram. 10
- (b) Explain the working of stabilized reactance modulator with suitable diagram. 10
4. (a) With help of neat diagram and waveforms explain generation and demodulation of PWM 10
- (b) Explain phase shift method for suppression of unwanted carrier with neat block diagram. 10

5. (a) Explain the following with reference to AM receiver 10
- (i) Double spotting
 - (ii) Three point tracking
 - (iii) Image frequency rejection ratio
 - (iv) Fidelity
- (b) Explain Indirect FM transmitter with suitable diagram. 10
6. Write short note on (any four) 20
- (a) Vestigial side band transmission (VSB) and its application.
 - (b) μ -law and A-law companding
 - (c) Frequency division Multiplexing (FDM)
 - (d) Amplitude limiting and thresholding
 - (e) Pre emphasis and de-emphasis circuits and its need