

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

(2) Attempt any **four** questions from remaining **six** questions.

(3) Assume **suitable** data whenever **necessary**.

(4) **Figures** to the **right** indicate **full** marks.

1. Attempt any **four** of the following :— 20
 - (a) Explain 'Noise factor' and 'Noise Temperature'.
 - (b) Explain F. M. noise triangle.
 - (c) Explain diagonal clipping and double spotting in relation to an A. M. radio receiver.
 - (d) Derive an expression for an A. M. voltage.
 - (e) Explain VSB transmission.

2. (a) Compare the following amplitude modulated systems. 12
DSB-FC, DSB-SC, SSB, VSB.
(b) Compare low level modulation and high level modulation. Draw the block diagrams of both transmitters. 8

3. (a) Explain the following with respect to frequency modulation :— 12
 - (i) Carson's rule
 - (ii) Pre-emphasis
 - (iii) De-emphasis
 - (iv) Wide band F. M.
(b) Explain Armstrong method of F. M. generation with the help of a neat block diagram. 8

4. (a) Explain pulse code modulation with the help of a neat block diagram. Why companding is needed in PCM ? 10
(b) Explain with the help of block diagram of Adaptive Delta Modulation (ADM) for generating digital modulated signal. Why it is preferred over delta modulation ? 10

5. (a) Explain modulation and Demodulation of PAM, PWM and PPM with neat block diagrams and waveforms. 12
(b) Explain the functioning of a superheterodyne A. M. receiver with the help of neat block diagram and waveforms. 8

6. (a) Explain the following terms with respect to radio wave propagation :— 10
 - (i) Skip distance
 - (ii) Virtual height
 - (iii) Maximum usable frequency
 - (iv) Fading
 - (v) Critical frequency.
(b) Explain TDM and FDM. 10

7. Write notes on :— 20
 - (a) Phase shift method of SSB generation.
 - (b) Sensitivity, selectivity and double spotting.
 - (c) Various noises that affect communication.