Time: 3 hours **Marks: 80**

N.B: 1. Questions.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.

Q.1 Solve **any four**. 20
a) Explain the difference between wideband FM and narrowband FM.
b) With the help of circuit diagram explain Delayed AGC.
c) Define Thermal Noise and describe its relationship with temperature and bandwidth.
d) What are the major factors influencing the choice of the intermediate frequency?
e) Explain Time Division Multiplexing.

Q.2 a) Draw the block diagram for an AM super-heterodyne receiverand describe its operation and primary functions of each stage with waveforms. 10

b) With the help of block diagram explain Phase Shift method of SSB generation. 10

Q.3 a) Explain generation and detection of Delta Modulation with the help of suitable block diagram also explain slope overload and granular noise. 10

b) Derive the relationship between total transmitted power and carrier power of AM signal. Calculate its transmission power efficiency. 10

Q.4 a) What are different methods of FM generation? Sketch the circuit and explain the principle of reactance modulator. 10

b) Explain generation and demodulation of PWM signal with the help of suitable diagrams and waveforms. 10

Q.5 a) With the help of circuit diagram and characteristics curve explain Balanced slope FM detector. 10

b) Explain in detail vestigial side band (VSB) system. Mention its applications. 10

Q.6 Solve **any four.** 20
a) Explain the difference between correlated and uncorrelated noise.
b) Explain sensitivity and selectivity.
c) Justify why FM is more immune to noise.
d) Compare FDM and TDM.
e) Explain Aliasing error and Aperture effect.

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