

**Duration: 3hrs**

**[Max Marks:80]**

- N.B. : (1) Question No 1 is Compulsory.  
(2) Attempt any three questions out of the remaining five.  
(3) All questions carry equal marks.  
(4) Assume suitable data, if required and state it clearly.

- 1 Attempt any **FOUR** [20]
- a Explain the necessity of de-emphasis and pre-emphasis
  - b Compare AM and FM.
  - c What is aliasing? How it can be avoided?
  - d A transmitter radiates 9kW of power with carrier unmodulated and 10.125 kW when modulated. Calculate the depth of modulation.
  - e List the advantages of pulse modulation over continuous modulation schemes.
- 2 a Explain indirect FM transmitter. [10]
- b Draw a neat block diagram of a superheterodyne radio receiver and explain each block in detail. [10]
- 3 a What are the different methods for SSB generation? Explain any one in detail. [10]
- b Explain the balanced slope detector with the help of a schematic diagram. [10]
- 4 a State and prove sampling theorem for low pass bandlimited signal. [10]
- b With the help of suitable waveforms explain the generation and detection of PPM [10]
- 5 a Draw and explain the FDM transmitter & receiver block diagram along with its applications. [10]
- b With the help of a block diagram explain the concept of PCM. [10]
- 6 a Explain in detail the balanced modulator with suitable expressions and waveforms. [10]
- b i) Write a note on Delta and adaptive delta modulation [10]
- ii) Explain VSB in broadcast television.

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