Time: 3 Hours **Max. Marks: 80**

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N.B.

1. **Question No.1 is Compulsory**
2. **From Remaining 5 Questions You are Required to Solve any 3 Questions.**
3. **Assume the data if Necessary**

1 Attempt Any Four: - **20**

a) Explain Block Diagram of Analog Communication System.
b) Explain pre-emphasis and de-emphasis in FM.
c) Justify how modulation reduces the height of antenna.
d) Differentiate Between Analog and Digital Communication system.
e) Explain importance of Fourier transforms in communication.

2 Attempt the Following **20**

a) Define Noise and explain in detail various sources of Noise.
b) Explain different types of channels in communication.

3 Attempt the Following **20**

a) A modulating signal 20 Sin (2π x10^3t) is used to modulate carrier signal 40 Sin (2π x10^4t). Find
   1. Modulation Index
   2. Percentage Modulation
   3. Sideband Frequencies and their amplitude
   4. Bandwidth of AM wave
   5. Draw the frequency spectrum

b) Explain in detail generation of DSBFC .

4 Attempt the Following **20**

a) Draw and explain in detail FM demodulator: Foster Seeley discriminator.
b) Explain in detail Armstrong method of generation of FM.

5 Attempt the Following **20**

a). Derive Friss formula for two stage cascade amplifiers. Am amplifier operating over a frequency range from 17 to 19MHz has an input resistance of 5kohms. What is the rms thermal noise voltage at the input of this amplifier. Assume the operating temperature to be 27 C.
b) Draw and explain in detail with block diagram High Level AM Modulator.

6 Attempt the Following (any four) **20**

a) Draw and explain Electromagnetic Spectrum and specify applications of different bands.
b) Write short note on phase shift method of SSB generation
c) Derive time shifting property of Fourier Transform.
d) Compare AM and FM.
e) Explain sensitivity and selectivity in AM Receiver.

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