

Time:3Hours

Total Marks:80

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

(2). Out of remaining attempt any three.

(3). Assume & mention suitable data wherever required.

(4). Figures to right indicates full marks.

Q.1 Solve any four

[20]

- Explain need of modulation. Justify it with example.
- Define the following terms.
 - Noise figure
 - Noise temperature
 - Noise bandwidth
 - Noise voltage
 - Modulation.
- Compare AM and FM.
- Explain in short pre-emphasis and De-emphasis.
- What is PSK signal. Draw the PSK signal for the following binary signal 111010011.
- Explain the principle of reflection and refraction.

Q.2 a) Define signal to noise ratio. Explain the effect of cascade connection on a signal to noise ratio. Derive Friss formula for two stage cascade amplifier.

[10]

b) Derive the expression for total power in AM.

[10]

Q.3 a) The AM Transmitter develops an unmodulated power o/p of 400 Watts across a 50Ω resistive load. The carrier is modulated by a sinusoidal signal with a modulation index of 0.8. Assuming $f_m = 5\text{KHz}$ and $f_c = 1\text{MHz}$.

(i) Obtain the value of carrier amplitude V_c and hence write the expression for AM signal.

(ii) Find the total sideband power.

(iii) Draw the AM wave for the given modulation index.

[10]

b) Explain quantization process in PCM with suitable diagram.

[10]

Q.4 a) What are the limitations of TRF receiver? Explain how these limitations are avoided using super-heterodyne receiver.

[10]

b) Compare ground wave, sky wave, space wave and tropospheric scatter propagation..

[10]

Q.5 a) Explain FDM transmitter & receiver with block diagram

[10]

b) Draw the block diagram of PAM generator and detector. Explain the working giving waveforms at the output of each block.

[10]

Q6. a) Explain slope overload error and hunting error in Delta modulation. Derive the condition to avoid slope overload distortion.

[10]

b) Explain the generation of SSB with phase shift method.

[10]