

(3 Hours)

[Total Marks : 80]

Please check whether you have got the right question paper.

N.B.:

1. Question No. 1 is Compulsory .
2. Out of remaining questions attempt three.
3. Figures to right indicate full marks.

1. Solve any **four** **20**
 - a) State various frequency bands with their typical values of electromagnetic spectrum along with their applications.
 - b) Derive the relation of Friss formula.
 - c) Explain need of modulation. Justify with example.
 - d) Explain pre-emphasis and de-emphasis circuits.
 - e) Compare FDM and TDM.
 - f) Explain tropospheric scatter propagation in brief.
2.
 - a) Draw and explain the block diagram of superheterodyne receiver. State the advantages of superheterodyne receiver over TRF receiver. **20**
 - b) What are different sources of noise? Classify and explain various noises that affect communications.
3.
 - a) With the help of neat circuit diagram explain Indirect method of FM modulation. **20**
 - b) What are the limitations of linear Delta Modulator? How are they overcome in Adaptive Delta Modulator?
4.
 - a) State and prove following properties of Fourier Transform **20**
 - i) Time Scaling
 - ii) Frequency Shifting
 - b) The AM transmitter develops an unmodulated power output of 400 watts across a $50\ \Omega$ resistive load. The is modulated by a sinusoidal signal with a modulation index of 0.8. Assume $f_m = 5\text{KHz}$ and $f_c = 1\text{ MHz}$. I) Obtain the value of carrier amplitude V_c and write the expression of AM signal.

II) Find the total sideband power. III) Find the total power in AM wave.

5. a) State and explain classification of line codes with neat diagram. 20
b) Compare PAM, PWM and PPM.
6. Answer any four 20
a) What is ISI? How can it be avoided?
b) Explain ground wave propagation.
c) Explain wired communication channel.
d) Explain Ration detector.
e) Compare ASK, FSK and PSK.
f) State and explain different noise parameters.
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