

Duration: 3 Hours

Marks: 80

- N.B (1) Question No. 1 is compulsory  
(2) Out of remaining questions attempt three  
(3) Figures to right indicate full marks.

- Q1) Solve any four 20 (5\*4)
- a) With the help of typical values, state various RF bands along with their Applications.
  - b) State Friiss formula & hence determine the overall noise figure in a two Stage cascaded amplifier if each stage has a gain of 10 dB along with a noise figure of 3 dB. (1+4)
  - c) Define Image frequency of AM receiver & hence calculate image frequency Of AM superheterodyne receiver with RF & IF frequencies of 600 KHz & 455 KHz respectively. (1+4)
  - d) Compare PAM, PWM & PPM system.
  - e) Define the following
    - (i) Quantization noise (ii) line coding process (iii) inter symbol interference
    - (iv) Bit rate (v) Baud Rate
  - f) Explain ground wave propagation in brief
- Q2 a) Explain following in relation to radio receiver with suitable figure
  - 1) Selectivity (2) sensitivity (3) double spotting (4) fidelity (10)
- b) Explain the principal of TDM with neat diagram. Also explain need of synchronization in TDM. (10) 6+4
- Q3 a) What are different sources of noise? Classify & explain various noises that affect Communications. ~~(10)~~ 20
- Q4 a) Explain/define/clarify the following term (10)
  - (i) Modulation index in AM (ii) Modulation index in FM
  - (iii) Over modulation in AM (iv) Total power in AM
  - (v) Transmission bandwidth in AM & FM
- b) State & explain classification of line codes with neat figure (10)
- Q5 a) Draw the ASK, PSK & FSK waveforms for digital data 11010101  
Also compare all three techniques of modulation (6+4) (10)
- b) State and prove following properties of Fourier transforms
  - 1) Time scaling 2) frequency shifting. (10)
- Also state significance of these properties in communication system (8+2)

Q6 Write short notes on following: **Any Four**

**20 (5\*4)**

- a) Need of modulation
- b) Ratio detector
- c) Sky wave propagation
- d) Quantization process
- e) FM Noise triangle
- f) Block diagram of analog communication system