

(3 Hours)

[Total Marks: 80]

- 1) Question 1 is compulsory
- 2) Solve any three from the remaining five questions
- 3) Assume suitable data if necessary.
- 4) Figures to the right indicate full marks

- Q.1. Answer any **four** questions from the following: [20]
- a) What are pre emphasis and De emphasis circuits?
 - b) What is vestigial sideband transmission? Where is it used?
 - c) Discuss the need for modulation in wireless communication system.
 - d) Why is PCM more resistant to noise?
 - e) Explain the significance of noise figure.
- Q.2.a Why the local oscillator frequency is always kept higher than the incoming signal frequency in a super heterodyne receiver? [05]
- b. For an AM DSBFC wave with a carrier power of 5 W and a modulation coefficient of 1, determine the upper and lower sideband powers and the total modulated power. [05]
- c. What is the importance of proper choice of RC time constant in an AM detector circuit? Explain with neat diagrams the distortions caused by improper time constant. [10]
- Q.3.a With the help of a neat circuit diagram, explain the working of Foster Seeley discriminator. What is its disadvantage? [10]
- b. Discuss the shortcomings of TRF receiver. [05]
- c. Why is AGC needed in super heterodyne receivers? [05]
- Q.4.a Justify the statement: "Multiplexing helps in proper use of communication resources" [10]
- b. Discuss in detail any two sampling techniques. [10]
- Q.5.a Explain the term companding as applied to Pulse Code Modulation. Why is Delta modulation an extreme case of PCM? [10]
- b. For a sinusoidal modulating signal, draw PPM, and PWM pulses. [05]
- c. Discuss a simple method of noise suppression in an FM wave. [05]
- Q.6 Write short notes on **any four**: [20]
- a) Choice of intermediate frequency in a super heterodyne receiver
 - b) Sky wave propagation
 - c) Delta modulation
 - d) Varactor diode detector
 - e) Image frequency