

Model Question Paper

Time: 3 Hours

Max.Marks: 100

Instructions:

1. **Group A** and **Group B** questions should be answered in the Main Answer book.
2. Answer any **TEN** questions in **Group A**. Each question carries three marks.
3. Answer **ALL** questions either **(a)** subdivision or **(b)** subdivision in **Group B**. Each question carries 14 marks.

Group – A

Marks: 10 x 3 = 30

1. What are the elements of communication?
2. The carrier performs certain functions in radio communications. What are they?
3. Mention the methods of communication.
4. Derive the relation between the output power of an AM transmitter and depth of Modulation.
5. Find the modulation index for the modulated wave whose carrier signal maximum amplitude is twice the message signal. Modulating signal amplitude is 15v.
6. Discuss the merits and demerits of SSB
7. Find the carrier and modulating frequencies, modulation index and maximum deviation of the FM wave represented by $v=12\sin(6 \times 10^8 t + 5 \sin 1250t)$
8. Describe frequency and phase modulation, by giving mechanical analogies for each.
9. What is the pre-emphasis & list its uses?
10. What are the functions fulfilled by the intermediate frequency amplifier in a radio receiver.
11. What is simple automatic gain control?
12. Mention the types of transmitter.
13. A lossless transmission line has a shunt capacitance of 100pf/m and a series inductance of 4uh/m. What its characteristics impedance?
14. Define the term power density.
15. Define the length of the antenna operating at a frequency of 500Hz.

Group– B

Marks: 5 x 14 = 70

16. a) Describe the functions of a radio transmitter and the corresponding functions of the receiver with neat diagram.

(OR)

- b) Define the modulation and explain the need for modulation.

17. a) Explain with the aid of waveforms, how a grid –Modulated class C amplifiers generates Amplitude modulation.
(OR)
b) Derive the expression for the Amplitude modulation.
18. a) Draw the complete diagram of the Armstrong frequency modulation system and explain the functions of the each block.
(OR)
b) Derive the Expression and draw the wave form of frequency modulation.
19. a) With the neat diagram explain how amplitude modulation will be done using balanced Modulator
(OR)
b) Briefly explain the function of each of the blocks in the superheterodyne receiver.
20. a) Draw the transmission line equivalent circuits and derive the transmission line equation.
(OR)
b) i) What is meant by elementary doublet? How does it differ from the infinitesimal dipole? (6)
ii) Explain fully what is meant by the term resonant antenna. (8)