

22334

23124

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
  - (2) Illustrate your answers with neat sketches wherever necessary.
  - (3) Figures to the right indicate full marks.
  - (4) Assume suitable data, if necessary.
  - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any FIVE of the following :**

**10**

- (a) Write IF values of (i) FM radio receiver (ii) MW band AM.
- (b) Write Carson's rule to calculate bandwidth of FM wave.
- (c) Define virtual height with respect to wave propagation.
- (d) Define modulation index of FM wave.
- (e) Define radiation pattern and antenna resistance.
- (f) Define the term signal to noise ratio.
- (g) Classify types of noise.

**2. Attempt any THREE of the following :**

**12**

- (a) Draw the block diagram of electronic communication system & describe function of each block.
- (b) Define the term AGC with respect to AM receiver. State its need.
- (c) Explain concept of Fading. State reasons of Fading.
- (d) Define modulation. State the need of modulation for effective communication.



- 3. Attempt any THREE of the following :** **12**
- (a) With the help of sketch explain simplex & duplex system.
  - (b) Compare ground wave and sky wave propagation (any 4 points).
  - (c) Draw block diagram of PLL as FM demodulator and describe function of each block.
  - (d) Draw radiation pattern for resonant dipole
    - (i)  $L = \lambda/2$  (ii)  $L = \lambda$  (iii)  $L = 3 \lambda/2$  (iv)  $L = 3\lambda$
- 4. Attempt any THREE of the following :** **12**
- (a) A 400 watt carrier is modulated to a depth of 75%. Calculate the total power in modulated wave. Calculate total power if same carrier is modulated to 50%.
  - (b) Draw construction of Yagi-Uda antenna. Draw its radiation pattern. State its application.
  - (c) Draw and explain block diagram of AM superheterodyne radio receiver.
  - (d) Compare amplitude modulation and frequency modulation (any 4 points).
  - (e) State frequency ranges of the following :
    - (i) Audio frequency
    - (ii) IR frequency
    - (iii) High frequency
    - (iv) Ultra high frequency
- 5. Attempt any TWO of the following :** **12**
- (a) Define frequency modulation with the help of suitable waveforms. Compare narrow band FM with wide band FM.
  - (b) Draw block diagram and describe working of Armstrong method to generate FM signal.
  - (c) Explain with sketch the duct propagation. Give its applications.
- 6. Attempt any TWO of the following :** **12**
- (a) Define modulation index of AM wave. Explain effect of modulation index on AM wave with waveforms.
  - (b) Explain sky wave propagation with neat diagram.
  - (c)
    - (i) Define resonant and non-resonant antenna.
    - (ii) Draw folded dipole antenna and explain with radiation pattern.
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