

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 it's 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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