

17437

21415

3 Hours / 100 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions :** (1) All Questions are *compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. (A) Attempt any SIX :

12

- (a) Explain :
 - (i) Radiation and (ii) Absorption
- (b) What is transverse electromagnetic wave ?
- (c) Define :
 - (i) Antenna gain
 - (ii) Antenna resistance
- (d) Explain the function of Baluns.
- (e) Draw the spectrum of electromagnetic waves.
- (f) State the different FM demodulation methods.
- (g) Draw the circuit diagram of simple AGC circuit.
- (h) Define IF frequency and the IF frequency for AM and write FM radio receiver.

(B) Attempt any TWO :

8

- (a) Draw and explain Ground wave propagation. State its advantages.
- (b) How can a quarter wave transformer be used for impedance matching ?

P.T.O.

- (c) Draw and explain the operation of Foster Seeley discriminator. Draw ckt. diagram of Foster Seeley discriminator and describe its operation.

2. Attempt any FOUR :

16

- (a) Define the following w.r.t. wave propagation :
- (i) Virtual height
 - (ii) Critical frequency
 - (iii) Maximum usable frequency
 - (iv) Skip distance
- (b) Explain different types of losses in transmission lines.
- (c) Draw and explain the operation of Horn antenna.
- (d) Explain selectivity and sensitivity of radio receiver.
- (e) Draw and explain the operation of loop antenna.
- (f) Draw the circuit diagram of ratio detector and explain its working.

3. Attempt any FOUR :

16

- (a) Draw and explain duct propagation.
- (b) Draw the equivalent circuit of transmission line for low frequency and radio frequency.
- (c) Draw Yagi-Uda antenna. Draw its radiation pattern. Explain its operation.
- (d) State various factors influencing the choice of IF for radio receivers.
- (e) Draw the radiation pattern for the resonant dipole with following lengths :
- (i) $L = \frac{\lambda}{2}$
 - (ii) $L = \lambda$
 - (iii) $L = \frac{3\lambda}{2}$
 - (iv) $L = 3\lambda$
- (f) Draw the block diagram of FM radio receiver and explain.

4. Attempt any FOUR :**16**

- (a) Derive the relation between reflection coefficient and standing wave ratio.
- (b) Describe space wave propagation with neat sketch.
- (c) Draw and explain the operation of TRF radio receiver.
- (d) Describe the importance of frequency tracking in AM radio receiver.
- (e) Draw the circuit diagram of amplitude limiter and describe its operation.
- (f) Draw and explain the operation of Cassegrain feed parabolic reflector.

5. Attempt any FOUR :**16**

- (a) Draw and describe the operation of superheterodyne radio receiver.
- (b) Explain the need of AGC and delayed AGC.
- (c) Draw and explain tropospheric scatter propagation.
- (d) Describe the working principle of transmission line and describe the balanced line with diagram.
- (e) Draw and explain the operation of phased array.
- (f) Explain the role of AFC in radio receiver.

6. Attempt any FOUR :**16**

- (a) Describe the purpose of short length transmission line for open and short circuit.
 - (b) Compare Resonant and non-resonant antenna (any four points).
 - (c) Draw and explain the working of practical diode detector circuit with waveforms.
 - (d) Draw and explain the operation of FM demodulator using PLL.
 - (e) Explain fidelity and dynamic range of radio receiver.
 - (f) Explain the operation of non resonant antenna.
-

