

17437

21314

3 Hours / 100 Marks

Seat No.

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- 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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) Attempt any SIX of the following:

12

- i) Define the term polarization.
- ii) With respect to space wave, what is radio horizon?
- iii) A piece of coaxial cable has characteristic impedance of 75Ω and a nominal capacitance of 69 PF/m. What is its inductance/meter.
- iv) Define the terms: Antenna resistance and ERP.
- v) Draw neat sketch showing constructional details of Yagi Uda antenna.
- vi) Explain the term: adjacent channel selectivity in AM receiver.
- vii) Draw neat circuit diagram of Foster Seelay Detector.
- viii) List the factors on which choice of IF depends.

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b) **Attempt any TWO of the following:** **8**

- i) Describe ground wave propagation. What is angle of tilt? How does it affect field strength.
- ii) Describe the purpose of short length transmission line with open and short circuit.
- iii) Draw neat block diagram of FM receiver.

2. **Attempt any FOUR of the following:** **16**

- a) Describe briefly structure of ionosphere and its effects on sky wave propagation.
- b) Describe the types of losses that may occur with RF transmission line. In what units these losses are normally given?
- c) Write the concepts of Hertzian dipole. Draw its radiation pattern.
- d) Draw construction of phased array and describe its working.
- e) Draw neat block diagram of superheterodyne AM receiver.
- f) Draw diagram of balanced slope detector and explain its operation.

3. **Attempt any FOUR of the following:** **16**

- a) What is fading? List its major causes.
- b) Explain how standing waves occur in an imperfectly matched transmission line.
- c) Define the terms: Beam width and band width of antenna.
- d) With sketches, describe any one method of feeding paraboloid reflector in the primary antenna located at focal point.
- e) Give the merits of simple AGC circuits.
- f) Describe the concept of AFC.

4. Attempt any FOUR of the following:**16**

- a) Draw neat sketch and explain tropospheric scatter.
- b) Draw equivalent circuit of transmission line at low frequency and for RF frequency.
- c) Explain meaning of term resonant antenna. Draw radiation patterns of resonant dipoles with length $l = \lambda/2$ and $l = \lambda$.
- d) List functions of RF amplifier in AM receiver.
- e) Draw neat circuit diagram of simple diode detector and explain its operation.
- f) With neat circuit diagram, explain operation of amplitude limiter circuit.

5. Attempt any FOUR of the following:**16**

- a) With neat sketch, explain effect of increasing angle of incidence of radio waves in sky wave propagation.
- b) Define and explain the term standing wave ratio. Give its formula for purely resistive load.
- c) Draw neat sketch and explain construction and working of loop antenna.
- d) Draw neat diagram and describe tracking. How is it carried out in AM receiver?
- e) Explain the terms fidelity and dynamic range of AM receiver.
- f) Draw neat sketch and explain operation of PLL based FM demodulator.

6. Attempt any FOUR of the following:**16**

- a) Define and explain the term characteristics impedance of transmission line. When is the i/p impedance of transmission line becomes equal to the characteristics impedance?
 - b) State the features of directional high frequency antenna. List its two examples.
 - c) What is horn antenna? How is it fed? List its applications.
 - d) Define:
 - i) selectivity
 - ii) sensitivity for AM receiver.
 - e) Give step by step procedure to be carried out for IF alignment.
 - f) Draw neat circuit diagram of ratio detector and describe its working principle.
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