21718

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)   Use of Non-programmable Electronic Pocket Calculator is permissible.

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

(8)   Use of steam tables, logarithmic, Mollier's chart is permitted.

Marks

1.   (A)   **Attempt any SIX :**   **12**

(a)   Define attenuation of electromagnetic wave.

(b)   Draw equivalent circuit of transmission line.

(c)   Name various wave propagation. Which type is used for low frequency wave ?

(d)   Draw neat diagram of Hertzian dipole.

(e)   Name UHF and microwave antenna and draw neat diagram of any one.

(f)   State function of mixer circuit in superheterodyne receiver.

(g)   State necessity of alignment in radio receiver.

(h)   State function of amplitude limiter block in FM receiver.

    (B) **Attempt any TWO :**   8

        (a) Describe following terms :

            (i) Virtual height

            (ii) Skip distance

        (b) Explain reactance properties of transmission line.

        (c) Draw block diagram of FM radio receiver. State function of FM demodulator.

2. **Attempt any FOUR :**   16

    (a) Describe ground wave propagation with neat sketches.

    (b) Define characteristics impedance of transmission line. State its importance.

    (c) Differentiate between resonant and non-resonant antenna for two points.

    (d) Describe working principle of focal feed parabolic reflector.

    (e) Draw block diagram of tuned radio receiver and explain each block.

    (f) State procedure for alignment of RF in radio receiver.

3. **Attempt any FOUR :**   16

    (a) Explain tropospheric scatter propagation.

    (b) What are standing waves ? Define SWR and VSWR.

    (c) Describe with neat diagram beamwidth and bandwidth of antenna.

    (d) What is antenna array ? Draw Yagi-Uda antenna.

    (e) With neat circuit of simple AGC, explain the working of AGC.

    (f) Draw neat circuit diagram of slope detector and explain it.

4. **Attempt any FOUR :**   **16**

    (a) Describe sky wave propagation. Give range of frequency propagate through sky wave.

    (b) Describe basic principle of transmission line.

    (c) Describe construction of broad side array. Draw radiation pattern of it.

    (d) Describe choice of IF used in radio receiver.

    (e) Draw neat circuit diagram of practical diode detector. Draw its waveforms.

    (f) Draw neat circuit diagram of amplitude limiter and explain its working.

5. **Attempt any SIX :**   **16**

    (a) Define critical frequency and maximum usable frequency. State their relationship.

    (b) Describe quarter wave line.

    (c) Draw neat diagram and state working of Horn antenna.

    (d) Describe image signal. How it is rejected ?

    (e) Describe with neat diagram selectivity and fidelity.

    (f) Describe AFC. How it is useful in receiver circuit ?

6. **Attempt any FOUR :**   **16**

    (a) Describe primary and secondary constants of transmission line.

(b) Define following terms w.r.t. antenna :

   (i) Antenna gain

   (ii) Directivity

   (iii) Power gain

   (iv) Antenna resistance

(c) Draw and explain working principle of dipole array.

(d) Describe frequency tracking.

(e) Draw neat diagram of ratio detector. How it is different from Foster Seelay detector ?

(f) Describe dynamic range of radio receiver.

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