

Con. 3893-10.

(REVISED COURSE)

AN-4459

(3 Hours)

[Total Marks : 100

- N.B. :** (1) Question No. 1 is compulsory.
 (2) Attempt any four questions out of remaining six questions.
 (3) Assume suitable data if required.
 (4) Figures to the right indicate full marks.

1. Attempt any four questions :- 20
 - (a) Find the length of a half wave dipole at 30 MHz, 300 MHz and 3000 MHz.
 - (b) Define directivity, antenna gain, polarisation of antenna.
 - (c) What is doppler effect ? (explain with relevant mathematical equation and example).
 - (d) In color TV system, explain the significance of color difference signals.
 - (e) Justify selection of 4.43 MHz as color subcarrier frequency.

2. (a) Derive an expression for maximum possible range of radar. 8
 (b) What is pulsed radar system ? Explain basic pulse radar system with the neat sketch. 8
 (b) Explain what is meant by term blind speed in MTI Radar. 4

3. (a) Define the terms :- 8
 - (i) Apogee
 - (ii) Perigee
 - (iii) Ascending Node
 - (iv) Descending Node.
- (b) With the help of neat block diagram explain satellite earth stations, discuss the functions of various blocks in it. Also derive the expression to show that a satellite launched into a circular orbit at a height (H) meters from the surface of the earth moving with a velocity (V). 12

4. (a) Explain in detail the various mechanisms for fiber attenuation and dispersion. 12
 (b) Explain with block diagram the various sub-parts of a fibre optic link. 4
 (c) An optical fibre has NA = 0.20 and a cladding refractive index of 1.59. 4
 Determine -
 - (i) The acceptance angle for the fiber in water having refractive index of 1.33.
 - (ii) The critical angle at the core-cladding interface.

5. (a) Explain Yagi-Uda antenna and log periodic antenna with respect to their radiation pattern dipole spacing, dipole lengths and applications along with the sketch. 12
 (b) Explain the de-gaussing circuit. 4
 (c) Discuss the broad side array and its radiation pattern. 4

6. (a) Explain what is equatorial, polar and inclined orbits. 5
(b) Distinguish between the resonant and non-resonant antennas. 5
(c) Why green signal is not transmitted? 5
(d) Draw and explain composite video signal. 5
7. Write short notes on the following (any four) :- 20
(a) Effect of ground on antennas
(b) Satellite uplink and downlink models
(c) Digital TV
(d) Differentiate between LEO, MEO and GEO stationary satellites
(e) HDTV.
