17656

21819

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.

Marks

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

(a) State the advantages of waveguide over two wire transmission line. (any 4)

(b) Draw construction and explain working of Reflex Klystron.

(c) Write RADAR range equation and state the factor affecting maximum range of RADAR.

(d) Define the following terms w.r.t. Satellite.

(i) Foot print (ii) Station keeping

(iii) Azimuth angle (iv) Elevation angle

(B) Attempt any ONE : **6**

(a) Draw different types of waveguide. What is dominant mode ? Explain wave propagation in rectangular waveguide.

(b) With neat sketch describe the operation of the GUNN Diode & list it's applications.

2. Attempt any FOUR : **16**

(a) Differentiate between TE mode & TM mode in rectangular wave guide.

(b) Write the effect of magnetic and electric fields in Magnetron.

(c) Write the operation of pulsed radar to detect the object.

(d) Draw block diagram of Satellite earth station and explain function of each block.

(e) Define (1) Critical angle, (2) Snell's Law, (3) Numerical aperture, (4) Acceptance angle.

(f) Give classification of optical fiber.

3. Attempt any FOUR : **16**

(a) State any two advantages and application of circular waveguide.

(b) With neat sketch describe the operation of PIN diode.

(c) Draw neat labelled block diagram of CW Doppler Radar & explain its working.

(d) Define the term orbit w.r.t. Satellite. List different types of orbits of Satellite.

(e) State & explain advantages of fiber optical communication. (any 4)

4. (A) Attempt any THREE : **12**

(a) Draw field pattern of circular waveguide.

(b) Draw construction of tunnel diode and describe its working principle.

(c) Define antenna scanning & its type used in a radar.

(d) Write working of Telemetry and tracking control sub-system in Satellite communication.

(B) Attempt any ONE : **6**

(a) With neat sketch draw block diagram of MTI radar system and explain working.

(b) Draw block diagram of fiber optic communication system & list out optical sources and detectors suitable for fiber optic communication.

5. Attempt any FOUR : **16**

(a) Draw constructional diagram of Isolator and explain its working.

(b) Describe with waveform, how signal grow in TWT.

(c) Draw constructional diagram of Edge Light emitter diode and explain its working.

(d) Draw block diagram of Satellite power sub-system.

(e) A silica optical fiber with core diameter large enough to be considered by ray theory analysis has core refractive index of 1.50 & cladding refractive index of 1.47. Calculate (1) Critical angle, (2) NA of fiber, (3) Acceptance angle.

(f) State the need of splicing & list different techniques used for optical fiber. Explain any one in detail.

P.T.O.

6. Attempt any FOUR : **16**

(a) Draw constructional diagram of two hole directional coupler & explain its working.

(b) Describe absorption and dispersion losses in optical fiber.

(c) Draw block diagram of OTDR and explain its working principle.

(d) Differentiate satellite communication and fiber optic communication w.r.t.

(i) Frequency range

(ii) Electro Magnetic Interference

(iii) Application

(iv) Limitation

(e) Draw the constructional diagram of PIN photo diode and explain its working.
