17656

11920

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 of the following : **12**

(a) Define the term w.r.t. waveguide :

(i) Cut-OFF frequency

(ii) Group Velocity

(b) Draw labelled sketch of TWT and give it's two applications.

(c) List different display methods used in Radar. Explain any one display method.

(d) Define the following terms with respect to satellite :

(i) Azimuth Angle

(ii) Elevation Angle

(B) Attempt any ONE of the following : **6**

(a) Describe rectangular waveguide in TE & TM mode.

(b) With suitable sketch and explain the working of IMPATT diode.

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

(a) State the advantages of circular waveguide and list its applications.

(b) Describe working of Reflex Klystron amplifier with a neat diagram.

(c) Describe the operation for pulsed radar to detect the object.

(d) Explain absorption loss and scattering loss occur in optical fiber.

(e) Explain advantages of satellite communication system.

(f) Distinguish between LED & LASER. (any four points)

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

(a) Compare between waveguide and two wire transmission line. (any four points)

(b) Sketch the construction of tunnel diode and write its operation.

(c) State two advantages and two applications of continuous wave radar.

(d) Define geo-stationary orbit and the geo-stationary satellite.

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

4. (A) Attempt any THREE of the following : **12**

(a) Draw the field pattern of circular waveguide for its dominant mode.

(b) Draw the construction of magnetron and describe its working.

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

(d) Illustrate how telemetry tracking and command system used in satellite communication.

(B) Attempt any ONE of the following : **6**

(a) Explain the working of MTI radar with the help of block diagram and with suitable waveforms.

(b) Explain with neat sketch block diagram of optical fiber communication system and list out sources and detectors suitable for it.

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

(a) Describe the working of directional coupler with neat diagram.

(b) Draw the construction of Gunn diode and explain its working.

(c) Write up-link and down-link frequency for c-band, x-band, ka-band & ku-band.

(d) Calculate critical angle of incidence between two substances with different refractive indices $n_1 = 1.5$ and $n_2 = 1.46$.

(e) Draw the construction of Avalanche photodiode. State its working principle.

(f) Define w.r.t. Optical fiber cable :

(i) Numerical Aperture

(ii) Acceptance Angle

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

(a) Describe with the neat sketch of hybrid junction and illustrate its properties.

(b) Draw the diagram of Fusion Splice and rigid alignment tube splice.

(c) Describe the antenna subsystem of satellite.

(d) Classify the optical fiber based on bands and specify their operating frequency ranges.

(e) Differentiate between single mode and multimode fiber. (four points)
