17670

15116

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

Marks

1. a) **Attempt any <u>THREE</u> of the following:** **12**

(i) Define terms w.r.t. waveguide:

(1) Phase velocity

(2) Cutoff wavelength

(ii) State the applications of reflex Klystron and Magnetron.

(iii) How doppler effect can be used to measure speed of moving objects?

(iv) Describe following terms w.r.t. Satellite:

(1) Footprint

(2) Station keeping

Marks

b) **Attempt any ONE of the following:** **6**

(i) What is dominant mode in waveguide? Draw field patterns of TE_{10} and TE_{11} mode.

(ii) Sketch the construction of PIN diode and write its operation.

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

a) Distinguish between Microwave Circular and Isolator with following parameters.

(i) Function

(ii) Construction

(iii) Application

(iv) Number of ports

b) Draw construction sketch of Magnetron and state its specification.

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

d) Draw the block diagram of satellite subsystem. State function of antenna subsystem.

e) State the reason for difference in uplink and downlink frequency in satellite communication.

f) Describe A-scope, API display method with its diagram.

Marks

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

a) Draw the diagram of corners and twists. State its function.

b) Sketch the construction of IMPATT diode and explain its operation.

c) Describe the operation of CW doppler radar with its block diagram.

d) Explain the Altitude and Orbit control system of satellite.

e) Explain following terms w.r.t. satellite:

(i) Azimuth angle

(ii) Elevation angle

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

(i) Draw H-plane and E-plane junction. State its application.

(ii) Sketch the construction of TRAPATT diode and explain its operation.

(iii) Explain the operation of pulsed radar system for detection of the object.

(iv) Draw the block diagram of satellite earth station. State function of HPA and LNA.

b) **Attempt any ONE of the following:** **6**

(i) Describe the operation of MTI radar with its block diagram and waveforms.

(ii) Draw construction sketch of two cavity Klystron and describe its working principle.

Marks

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

a) Draw the block diagram of communication channel subsystem. State function of each block.

b) State applications of:

(i) Gunn diode

(ii) IMPATT diode

c) Compare waveguide with two wire transmission line (four points)

d) Show how reflex Klystron can be used as an amplifier.

e) Draw labelled sketch of TWT. State its applications.

f) How power is generated in satellite? Describe how it is distributed to other subsystem of satellite.

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

a) Illustrate how telemetry tracking and command subsystem used in satellite communication.

b) What are cavity Rosonators? State its operation.

c) Explain the operation of magnetron as an oscillator.

d) State the advantages of microwave tube over conventional vacuum tube.

e) Sketch the construction of Gunn diode and explain its operation.

f) What are Radar becons? State its applications.

———