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11718

3 Hours / 100 Marks

Seat No.

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- 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. Attempt any five :

20

- a) Define terms group velocity and cutoff frequency with reference to waveguide.
- b) List advantages of microwave tubes over conventional vacuum tubes (any two)
- c) With the help of neat sketch describe the construction of PIN diode.
- d) Define Radar beacons. Describe their typical usages.
- e) Explain the term station keeping with respect to Satellite communication.
- f) Sketch the field pattern for dominant mode TE_{11} in circular waveguide.
- g) Describe the working of frequency modulated C.W. Radar system with the help of block diagram.

2. Attempt any four :

16

- a) Compare between circulator and isolator.
- b) Sketch constructional details of TWT and explain its working.
- c) Give specification and application of IMPATT diode.
- d) Describe PPI display method used in radar system.
- e) Define Azimuth angle and angle of elevation with respect to Satellite communication.
- f) List any four microwave frequency bands with their frequency range. Give application of microwave frequency.

P.T.O.

**3. Attempt any two :****16**

- a) Describe the function of following microwave component with the help of neat sketch :
- i) Bends
 - ii) Corner
 - iii) Flange
 - iv) Twist
- b) Describe the working of two cavity Klystron amplifier with neat diagram. List any two applications.
- c) Describe the operation of Gunn diode with the help of labelled sketches.

4. Attempt any four :**16**

- a) Describe the function of Hybride-Tee with a neat diagram.
- b) Compare waveguide with two wire transmission lines (any four points).
- c) List any two applications and four specifications of magnetron.
- d) Draw schematic of reflex Klystron and describe its function as amplifier.
- e) Describe the operation of TRAPATT diode with the help of well labelled sketches.
- f) List various antenna scanning patterns and draw the same.

5. Attempt any four :**16**

- a) Give two application each for
- i) Reflex Klystron
 - ii) Travelling wave tube.
- b) Describe working of microwave bipolar transistor with characteristics curve.
- c) State factors influencing maximum range of Radar.
- d) State various Antenna tracking methods used in Radar system. Describe monopulse tracking method.
- e) Draw labelled block diagram of satellite subsystem.
- f) With the help of block diagram describe the working telemetry, tracking and control subsystem of satellite.

6. Attempt any four :**16**

- a) Draw diagram of pulsed radar system and state function of each block.
- b) Draw block diagram of MTI radar system and give function of COHO and STALO.
- c) Explain why uplink frequency is greater than Downlink frequency.
- d) Draw block diagram of satellite earth station and state function of low noise amplifier and high power amplifier.
- e) Describe the function of power subsystem in satellite.
- f) With the help of block diagram, describe the working of communication channel subsystem of satellite.
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