

17670

21415

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

Marks

1. Attempt any FIVE :

20

- List any 4 microwave frequency bands with their frequency range and give two applications of each.
- Draw schematic of reflex klystron and describe its function as amplifier.
- With the help of neat sketch, describe construction of GUNN diode.
- List any 4 factors influencing maximum range of radar.
- Define the terms : Uplink and Downlink frequencies with respect to satellite communication.
- Explain the term : Cut off frequency with reference to wave guide.
- Describe any two antenna scanning methods used in radar with neat sketches of scanning patterns.

2. Attempt any FOUR :

16

- Compare wave guide with 2 wire transmission lines.
- With neat schematic explain operation of two cavity Klystron amplifier.
- Draw neat sketch and explain working of PIN diode as an microwave component.
- Define radar beacons. Describe their typical usage.
- Describe station keeping in satellite communication system.
- Describe the function of isolator with neat schematic diagram. Give any 2 applications of isolator.

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- 3. Attempt any TWO :** **16**
- (a) (i) Describe the function of E & H plane junction in microwave communication system with neat diagram.
 - (ii) Describe working of cavity resonator with the help of neat diagram.
 - (b) Describe working of magnetron with neat diagrams. List any two applications.
 - (c) Describe the operation of impatt diode with the help of well labelled sketches.
- 4. Attempt any FOUR :** **16**
- (a) Define the terms : Group velocity and phase velocity with respect to wave guide.
 - (b) Describe function of following microwave components with the help of neat sketch :
 - (i) Flanges
 - (ii) Taper & Twist
 - (c) List advantages of microwave tubes over conventional vacuum tube (any 4).
 - (d) Draw well labelled schematic of TWT and describe its working as amplifier. List any 2 applications of TWT.
 - (e) Describe working of microwave bipolar transistor with characteristics curve.
 - (f) Describe A-scope display method used in Radar system.
- 5. Attempt any FOUR :** **16**
- (a) List two applications of two cavity Klystron and four specifications of same.
 - (b) Give specifications and applications of Trapatt diode.
 - (c) Draw block diagram of basic pulse radar system and describe the function of each block.
 - (d) Draw block diagram of MTI radar system and give function of COHO and Stalo.
 - (e) Define the term : look angles, footprint in satellite communication system.
 - (f) Draw the block diagram of communication subsystem of satellite.

6. Attempt any FOUR :**16**

- (a) Describe the working of CW Doppler radar system with help of block diagram.
 - (b) List various antenna tracking methods used in radar system. Describe mono pulse tracking method.
 - (c) With the help of block diagram, describe the working of TTC subsystem of satellite.
 - (d) Draw well labelled block diagram of satellite subsystem.
 - (e) Draw block diagram of satellite earth station transmitter and state function of each block.
 - (f) Describe the function of propulsion subsystem and antenna subsystem in satellite.
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