

22535

23124

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Attempt **06** questions including Question No. 1 which is compulsory.
 - (3) Answer each next main Question on a new page.
 - (4) Illustrate your answers with neat sketches wherever necessary.
 - (5) Figures to the right indicate full marks.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following :

10

- (a) List two applications of IMPATT diode.
- (b) State different types of waveguides.
- (c) Give the applications of RADAR.
- (d) Draw constructional details of Gunn diode and label it.
- (e) State the frequency for following bands :
 - (i) C Band
 - (ii) X Band
 - (iii) K Band
 - (iv) Ku Band
- (f) List two advantages of pulse RADAR system.
- (g) Draw neat sketches of Magic Tee and label it.



- 2. Attempt any THREE of the following :** **12**
- (a) Compare waveguide and two wire transmission line (4 points).
 - (b) State the types of Radar Antenna Scanning and explain spiral scanning.
 - (c) Describe operating principle of directional coupler and give two applications.
 - (d) Define Doppler effect. Draw block diagram and explain principle operation of CW doppler Radar.
- 3. Attempt any THREE of the following :** **12**
- (a) Draw construction diagram of magnetron and label it. Give two applications.
 - (b) Compare TE & TM modes (any four points).
 - (c) State RADAR tracking antennas types and explain any one type of tracking antennas.
 - (d) Draw block diagram of MTI RADAR and explain function of each block.
- 4. Attempt any THREE of the following :** **12**
- (a) State the working principle of Reflex Klystron and explain applegate diagram.
 - (b) Explain tunnel diode with neat sketch.
 - (c) State working principle of Sonar system and list four applications.
 - (d) State the advantages, disadvantages and application of circular waveguide.
 - (e) Draw and explain block diagram of basic RADAR system.
- 5. Attempt any TWO of the following :** **12**
- (a) Derive the maximum Radar range equation. Also state significance of each term.
 - (b) Compare with neat sketches Gyrator, Isolator and Circulators (any four points).
 - (c) Draw and explain PIN diode. Also state its two applications.
- 6. Attempt any TWO of the following :** **12**
- (a) Compare the performance of Klystron, Magnetron and TWT (4 points each).
 - (b) A rectangular waveguide has a cross-section of dimensions $a = 10$ cm, $b = 2.5$ cm. The waveguide is air-filled and operated at frequency 4 GHz.
 - (c) Draw and explain working principle of TWT. Also state its two advantages and two applications.
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