

22587

12425

03 Hours / 70 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 of the following:** **10**
 - a) List different robotic end effectors.
 - b) State any four end effector commands.
 - c) State the function of force sensor.
 - d) State the types of robot maintenance.
 - e) List various methods of robot programming.
 - f) List various future technologies of robot.
 - g) State various image devices used in robot lightining techniques.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Explain tactile sensor with neat sketch.
 - b) List requirements of good programming language.
 - c) Explain need of robotic system in industry.
 - d) Differentiate between preventive maintenance and predictive maintenance.
- 3. Attempt any THREE of the following:** **12**
- a) Explain advance sensor capabilities technology.
 - b) Explain application of robot in spot and continuous arc welding.
 - c) Define:
 - i) Accuracy
 - ii) Resolution or Precision
 - iii) Repeatability
 - iv) DOF
 - d) State different laws of robot.
- 4. Attempt any THREE of the following:** **12**
- a) Explain edge detection and its procedure.
 - b) Explain various robot motion with neat sketch.
 - c) State the needs of robot maintenance.
 - d) Explain lead through programming method.
 - e) Explain the concept universal hand.

5. Attempt any TWO of the following:**12**

- a) Write VAL robot program for palletization of parts in pallet having 4 row that are 60 mm apart and 6 column 50 mm apart. The robot must pick parts from a incoming chute and are 25 mm tall.
- b) Explain procedure of robot maintenance.
- c) Explain mobility, locomotion and navigation technology use in robots.

6. Attempt any TWO of the following:**12**

- a) Explain anatomy of a robot.
 - b) List any 6 VAL commands with function used in programming.
 - c) Explain with block diagram components of digital image processing.
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