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12526

3 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) State functions of robot vision system.
- b) Enlist various robotic end effectors.
- c) State the role of imaging devices in robot lighting techniques.
- d) State functions of proximity sensor.
- e) List the different joints used in robots.
- f) Give any two end effector commands used in robot programming.
- g) List the future mechanical design features used in robotics for advanced applications.

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- 2. Attempt any THREE of the following : 12**
- a) Define:
 - i) Accuracy
 - ii) Work envelope
 - iii) Load carrying capacity
 - iv) Control Resolution
 - b) Explain need of robotic system in industry.
 - c) Explain gripper selection criteria for industrial application.
 - d) Classify robot sensors in details.
- 3. Attempt any THREE of the following : 12**
- a) Explain edge detection and its procedure.
 - b) Explain analog to digital conversion process used in robot vision system.
 - c) State limitations of lead through programming method.
 - d) Explain working of piezoelectric sensor with diagram.
- 4. Attempt any THREE of the following : 12**
- a) Explain Teach pendant in brief.
 - b) Explain various robot motion with neat sketch.
 - c) Explain mobility, locomotion and navigation technology used in robots.
 - d) Explain telepresence and list any four related technologies.
 - e) State requirements of good programming language.

- 5. Attempt any TWO of the following : 12**
- a) Explain various elements of Industrial robot system. (Any three)
 - b) Select the proper end effectors with justification for tasks like –
 - i) Gripping
 - ii) Painting
 - iii) Welding.
 - c) Write a program for inspection of bolt. (Assume all necessary dimensions)
- 6. Attempt any TWO of the following : 12**
- a) Explain construction and working of Vidicon camera with diagram.
 - b) Explain motion interpolations for following.
 - i) Point to point
 - ii) Linear
 - iii) Circular
 - c) Explain applications of Robot in material handling.
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