

Elective - I : Industrial Robotics

P. Pages : 2

Time : Three Hours



TKN/KS/16/7555

Max. Marks : 80

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- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain with the help of sketches various configuration of robot. 7
- b) Explain following terms for robot arm performance: 7
- i) Work volume
 - ii) Accuracy
 - iii) Repeatability.

OR

2. a) Define industrial robot and explain various types of joints used in robot with neat sketches. 7
- b) Explain work volume for various robot anatomies in details. 7
3. a) Explain different types of magnetic grippers and electrostatic grippers with neat sketches. 7
- b) Describe robot end effector structure and enlist the applications of each type of grippers. 6

OR

4. a) Describe in brief mechanical grippers and state their types with applications. 7
- b) Explain drive system for grippers in robots. 6
5. a) Explain in brief robot programming and methods of programming. 7
- b) Describe the various motion system followed by robots in brief & state their application area. 6

OR

6. a) Explain forward and reverse transformation of two DOF manipulator. 6

- b) What are the different types of robot drive system? Explain with advantages and disadvantages. 7
7. a) Explain different types of contact type sensors and position sensors. 6
- b) Explain 'Sensors' in robots? State their types with application in detail. 7

OR

8. a) Explain in brief safety measures in robots & discuss factor affecting robot economy. 6
- b) Explain with principle of range imaging sensor with neat sketch. 7
9. a) What are various robot cell layouts? Explain with neat sketch along with its application area. 7
- b) Explain in brief robot cycle time analysis. 7

OR

10. Write short notes on **any three**. 14
- a) Interlocks
- b) Error detection and recovery.
- c) Work cell controller
- d) Robot and machine inter face.
11. a) Explain a plastic moulding operation performed using robot manipulator in brief. 6
- b) Discuss in brief the various general considerations for robots in material handling operation. 7

OR

12. a) Describe stamping press operation using robot with application. 7
- b) Discuss robot implementation in machine loading and unloading operations. 6
