B.E. (Fire Engineering) Seventh Semester (C.B.S.)

Elective - II : Robotics and Robot Application

P. Pages : 2 **NRT/KS/19/3970**

Time : Three Hours * 0 3 1 8 * Max. Marks : 80

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. Diagrams and chemical equations should be given whenever necessary.
11. Illustrate your answers whenever necessary with the help of neat sketches.
12. Use of non programmable calculator is permitted.

1. a) Explain with neat sketch SCARA and jointed Arm Robot Configuration. **7**

b) Explain work volume of various robot anatomies in details. **6**

OR

2. a) Explain in brief joint notation schemes in context of Robot. **6**

b) Explain importance of Robot in Industry. Draw a neat schematic line sketch of Robot wrist showing various motion on it. **7**

3. a) What are end effectors? Explain mechanical gripper in detail. **7**

b) Explain drive system for gripper in Robot? **7**

OR

4. a) Explain with neat sketch internal & external grippers. **7**

b) Explain working of magnetic & Electrostatic grippers. **7**

5. a) Explain the role of sensors in Robot. Describe position sensors and it's types. **8**

b) Explain power transmission system in robot? **5**

OR

6. a) What is controller? Explain in detail different types of controllers. **8**

b) Explain working of AC servomotors. **5**

7.	a)	Explain role of artificial intelligence in robotics.	**4**
	b)	Write a LISP program which might be able determine if one object is on top of another. Assume you are given the location of two objects in the from of a list (x, y, z) for each object. Assume that if x and y are equal for both parts and z is greater for one than the other that one is on top. Use CAR and CDR to get the individual x, y and z values and the perform the comparisons.	**9**

OR

8.		What is artificial intelligence? Explain knowledge representation, problem representation and problem solving?	**13**
9.	a)	Explain quantitative techniques for economic performance of Robot.	**7**
	b)	Explain with suitable diagram the application of robot for die casting operation.	**7**

OR

10.	a)	What are general consideration in robotic material handling?	**7**
	b)	Explain the loading and unloading operation using robot.	**7**
11.	a)	Explain the application of robot in hazardous and non manufacturing in acessible environment.	**8**
	b)	Describe flexible manufacturing systems.	**5**

OR

12.	a)	Write short note on Robot Intelligence?	**4**
	b)	Describe different applications of Robot in Service Industries.	**9**

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