



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Mechanical Engineering

Semester End Examination; July / Aug. - 2022

Industrial Robotics and Automation

Time: 3 hrs

Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1: Explain work volume, resolution and accuracy of various configuration of robots.

CO2: Identify different types of joints and efforts and cells are required for specific applications.

CO3: Develop robot program using robot languages.

CO4: Explain levels of automation and computer process control.

CO5: Describe requirements of robot systems for various industrial applications.

Note: I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
I : PART - A		10			
I a.	Define automation and robotics in brief.	2	L1,2	CO1	PO1
b.	Enumerate the types of drive systems for industrial robots.	2	L1,2	CO2	PO2
c.	List the programming method for industrial robots.	2	L1	CO3	PO1
d.	List the basic elements of an automated system.	2	L1	CO4	PO1
e.	Enumerate the material transfer functions carried out by a robot.	2	L1,2	CO5	PO1
II : PART - B		90			
UNIT - I		18			
1 a.	Elucidate the different types of automation with suitable schematic.	9	L2,3	CO1	PO2
b.	Elucidate the evolution of industrial robots and their role in automation.	9	L2,3	CO1	PO2
c.	Discuss the concept of resolution, accuracy and repeatability with suitable schematic.	9	L1,2	CO1	PO1
UNIT - II		18			
2 a.	With a neat schematic, explain the construction and functioning of tactile sensors.	9	L1,2	CO2	PO2
b.	With a neat schematic, elucidate hydraulic drive system used in industrial robots.	9	L2,3	CO2	PO2
c.	Elucidate the principle and functioning of proximity sensors with neat a schematic.	9	L2,3	CO2	PO1

Contd... 2

UNIT - III**18**

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|---|---|------|-----|-----|
| 3 a. Elucidate lead through teaching program method for industrial robot. | 9 | L2,3 | CO3 | PO2 |
| b. Discuss different generation of robot programming. | 9 | L1,2 | CO3 | PO1 |
| c. Discuss the different motion commands which are used for writing program for robots. | 9 | L1,2 | CO3 | PO2 |

UNIT - IV**18**

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|---|---|------|-----|-----|
| 4 a. Elucidate the basic elements of an automated system with a neat schematic. | 9 | L2,3 | CO4 | PO1 |
| b. Discuss the different advanced automation functions carried out in industry. | 9 | L1,2 | CO5 | PO1 |
| c. Elucidate the different levels of Industrial automation. | 9 | L2,3 | CO5 | PO2 |

UNIT - V**18**

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|---|---|------|-----|-----|
| 5 a. Elucidate the major consideration in robot handling process. | 9 | L2,3 | CO5 | PO1 |
| b. Discuss pick and place operation by robot with a neat schematic | 9 | L1,2 | CO5 | PO1 |
| c. With a neat schematic diagram, elucidate die-casting operation carried out by robot. | 9 | L2,3 | CO5 | PO2 |

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