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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; August - 2023

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 configurations of robots.
CO2: Identify different types off 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**			
1 a.	Define accuracy with respect to industrial robot.	2	L1	CO1	PO1
b.	Name different types of gripper used in robots.	2	L1	CO2	PO1
c.	Name different programming methods to write program for industrial robot.	2	L1	CO3	PO1
d.	Name different computer process control and its capabilities.	2	L1	CO4	PO1
e.	Name different material handling operations carried out by industrial robot.	2	L2	CO5	PO1
	II : PART - B	**90**			
	UNIT - I	**18**			
2 a.	Define automation. List and explain different automation process by plotting a graph with volume versus variety of product to be produced in industry.	9	L2	CO1	PO1
b.	Give classification of robot based on physical configuration. Explain anyone with a neat diagram.	9	L1	CO1	PO1,3
c.	With a neat diagram explain Servo control for closed loop control system.	9	L3	CO1	PO3
	UNIT - II	**18**			
3 a.	With a neat block diagram explain hydraulic drive system with their advantages and limitations.	9	L2	CO2	PO2
b.	Draw a neat diagram and explain principle and working of tactile sensor.	9	L1	CO2	PO3
c.	Explain proximity sensor with neat diagram.	9	L2	CO2	PO3
	UNIT - III	**18**			
4 a.	Mention different motion commands which are used to write robot programming.	9	L2	CO3	PO1
b.	Explain lead through programming method to write a program for industrial robot.	9	L1	CO3	PO2

Contd….2

c.	Explain different generations of robot programming.	9	L2	CO3	PO3
	UNIT - IV	**18**			
5 a.	With a neat block diagram explain basic elements of automated system in industry.	9	L1	CO4	PO1
b.	Explain advanced automation functions in detail.	9	L1	CO4	PO3
c.	Explain different levels of automation in industry.	9	L2	CO4	PO2
	UNIT - V	**18**			
6 a.	Explain different material handling operations carried out by industrial robot.	9	L2	CO5	PO1
b.	With neat diagram explain plastic moulding operation.	9	L1	CO5	PO2
c.	With neat diagram explain forging operation carried out by industrial robots.	9	L2	CO5	PO2

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