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# B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## June 2025 Semester End Main Examinations

Programme: B.E.

Branch: Mechanical Engineering

Course Code: 23ME6PCAUR / 22ME6PCAUR

Course: Automation and Robotics

Semester: VI

Duration: 3 hrs.

Max Marks: 100

**Instructions:** 1. Answer any FIVE full questions, choosing one full question from each unit.  
2. Missing data, if any, may be suitably assumed.

<b>Important Note:</b> Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.			<b>UNIT - I</b>	<b>CO</b>	<b>PO</b>	<b>Marks</b>
	1	a)	Describe the basic elements of an automated system with a neat block diagram. Explain the role of each component.	CO1	PO1	10
		b)	Compare and contrast different types of production systems (Job shop, Batch, Mass, and Continuous production) with suitable examples.	CO1	PO1	10
			<b>OR</b>			
	2	a)	Compare traditional manufacturing with automated manufacturing systems.	CO1	PO1	10
		b)	Explain the working principle of mechanical feeders and hoppers in automated assembly systems. Provide examples of their applications.	CO1	PO1	10
			<b>UNIT - II</b>			
	3	a)	What is Cellular Manufacturing. Discuss how it improves production efficiency?	CO2	PO1	10
		b)	Define Flexible Manufacturing System (FMS) and explain its key features and advantages in modern manufacturing.	CO2	PO1	10
			<b>OR</b>			
	4	a)	Explain the concept of Group Technology (GT) and its benefits in manufacturing.	CO2	PO1	10
		b)	Define machine vision systems and explain their key components. How are they used for defect detection in manufacturing?	CO2	PO1	10

			<b>UNIT - III</b>			
5	a)	Explain the key principles of material handling and discuss how automation contributes to their implementation.	CO4	PO1	<b>10</b>	
	b)	Sketch and designate a typical 5-axis CNC machine.	CO4	PO1	<b>10</b>	
		<b>OR</b>				
6	a)	Explain the key elements of a CNC system with block diagram.	CO4	PO1	<b>10</b>	
	b)	What is an automated guided vehicle system (AGVS)? Explain three categories of automated guided vehicles.	CO4	PO1	<b>10</b>	
		<b>UNIT - IV</b>				
7	a)	Discuss the different configurations of robots, based on their joint arrangements.	CO4	PO1	<b>10</b>	
	b)	With block diagram explain the working of robot control unit.	CO4	PO1	<b>10</b>	
		<b>OR</b>				
8	a)	Explain the anatomy of an industrial robot with a neat diagram.	CO4	PO1	<b>10</b>	
	b)	Define work volume (workspace) of a robot. How does the robot's configuration affect its work envelope?	CO4	PO1	<b>10</b>	
		<b>UNIT - V</b>				
9	a)	Compare textual programming and graphical programming methods for robots. Which is more suitable for complex applications?	CO4	PO1	<b>10</b>	
	b)	Discuss how robots are used in assembly and inspection processes.	CO3	PO1	<b>10</b>	
		<b>OR</b>				
10	a)	What are the advantages and disadvantages of online vs. offline robot programming? Provide examples where each method is preferred.	CO4	PO1	<b>10</b>	
	b)	Describe the steps involved in programming of a simple pick-and-place operation.	CO3	PO1	<b>10</b>	

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