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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.**

**Semester: VI**

**Branch: Mechanical Engineering**

**Duration: 3 hrs.**

**Course Code: 23ME6PCAUR / 22ME6PCAUR**

**Max Marks: 100**

**Course: Automation and Robotics**

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

<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	<b>10</b>
	b)	Compare and contrast different types of production systems (Job shop, Batch, Mass, and Continuous production) with suitable examples.	CO1	PO1	<b>10</b>
<b>OR</b>					
2	a)	Compare traditional manufacturing with automated manufacturing systems.	CO1	PO1	<b>10</b>
	b)	Explain the working principle of mechanical feeders and hoppers in automated assembly systems. Provide examples of their applications.	CO1	PO1	<b>10</b>
<b>UNIT - II</b>					
3	a)	What is Cellular Manufacturing. Discuss how it improves production efficiency?	CO2	PO1	<b>10</b>
	b)	Define Flexible Manufacturing System (FMS) and explain its key features and advantages in modern manufacturing.	CO2	PO1	<b>10</b>
<b>OR</b>					
4	a)	Explain the concept of Group Technology (GT) and its benefits in manufacturing.	CO2	PO1	<b>10</b>
	b)	Define machine vision systems and explain their key components. How are they used for defect detection in manufacturing?	CO2	PO1	<b>10</b>

**Important Note:** 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 - 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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