CBCS SCHEME

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BMT602

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
Industrial Robotics

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	What is Robot Anatomy and explain with a neat sketch different types of configurations in industrial robots.	12	L2	CO1
	b.	What is Work volume? Discuss with a neat sketch the work volume of cylindrical and Cartesian robots.	8	L2	CO1
		OR			
Q.2	a.	What is end effector? Discuss different types of end effectors.	10	L2	CO1
	b.	Derive the mathematical model and transfer function equation for spring mass damper system.	10	L2	CO1
		Module – 2			
Q.3	a.	What is manipulator path controller? Explain the types of manipulator path controller.	10	L2	CO3
	b.	Explain the factors that should be considered in selection of grippers.	10	L2	CO3
		OR			
Q.4	a.	Briefly explain proximity and range sensors with a neat sketch.	10	L2	CO1
	b.	Discuss with a block diagram the functions of a machine vision system.	10	L2	CO1
		Module – 3			
Q.5	a.	Discuss the x-y-z coordinate motion of defining the position in space.	10	L3	CO2
	b.	Explain the capabilities and limitations of lead through methods.	10	L3	CO2
		OR			
Q.6	a.	Briefly explain the goals of AI research.	10	L3	CO2
	b.	Discuss the depth-first and breadth first AI search techniques for problem solving.	10	L3	CO2
		Module – 4			
Q.7	a.	With a neat sketch, explain the basic types of robot cell layouts.	12	L2	CO4
	b.	Explain the factors to be considered in the design of robot work cell.	8	L2	CO4

		OR			
Q.8	**a.**	What are Interlocks? Explain the types of interlocks and its purpose.	**10**	**L2**	**CO4**
	b.	Write a short note on: i) Robot cycle time analysis ii) Error detection and recovery.	**10**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Explain with a neat sketch the automatic processing operation of spot-welding using robot.	**10**	**L3**	**CO2**
	b.	Discuss the requirements of robotics system in spray-coating applications and its benefits.	**10**	**L2**	**CO2**
		OR			
Q.10	**a.**	With the neat sketches explain the remote center compliance device system.	**10**	**L3**	**CO2**
	b.	Discuss with a neat sketch series assembly robotic work cell.	**10**	**L2**	**CO2**

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