Reg. No.															

Question Paper Code	14141

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Sixth Semester

Mechanical and Automation Engineering

20MUPC602 – ROBOTS AND SYSTEMS IN SMART MANUFACTUIRING

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	The word Robot is derived from the Czech word "Robota" meaning _____ (a) Forced labourer (b) Toy (c) Teache (d) Intelligent worker	1	K1	CO1
2.	From the following in which FMS layout robots are used as material handling system (a) Ladder layout (b) Open field layout (c) Loop layout (d) Robot centered layout	1	K1	CO1
3.	Which type of robot is best suited for palletizing and packaging applications? (a) Articulated robot (b) Cartesian robot (c) Delta robot (d) Collaborative robot (Cobot)	1	K1	CO2
4.	Which application uses robots to load/unload parts into CNC machines? (a) Welding (b) Machine tending (c) Quality inspection (d) 3D printing	1	K1	CO2
5.	Which type of material handling equipment is used for lifting and transporting heavy loads in warehouses? (a) Belt conveyor (b) Forklift (c) Hand truck (d) Hoist	1	K1	CO3
6.	ASRS is commonly used in which of the following industries? (a) Agriculture (b) Manufacturing and warehousing (c) Real estate (d) Banking	1	K1	CO3
7.	Which language is commonly used for industrial robot programming? (a) Python (b) C++ (c) RAPID (d) All of the above	1	K1	CO4
8.	What does the acronym "ROS" stand for in robotics? (a) Robotic Operation System (b) Robot Operating System (c) Robotic Optical Sensors (d) Remote Operating System	1	K1	CO4
9.	Which types of robots are commonly used for welding in shipbuilding? (a) Articulated robots (b) SCARA robots (c) Mobile robots (d) Exoskeletons	1	K1	CO5
10.	What is the primary role of robots in the microelectronics industry? (a) Playing video games (b) Automating delicate assembly and manufacturing processes (c) Cooking food in semiconductor factories (d) Writing microprocessor software	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Define a Robot.	2	K1	CO1
12.	Discuss about requirements of FMS.	2	K2	CO1
13.	Justify the need of Robot economics.	2	K2	CO2
14.	List out few industrial applications which require robots.	2	K1	CO2
15.	Define ASRS.	2	K1	CO3
16.	Differentiate AGV from RGV.	2	K2	CO3
17.	What is a teach pendant?	2	K1	CO4
18.	List out various types of robot control.	2	K1	CO4
19.	Name a few applications of Robots in manufacturing.	2	K1	CO5
20.	List down few applications of Robots in terrestrial locations.	2	K1	CO5
21.	Write few high level programming languages.	2	K2	CO4

22.		Classify various types of material handling systems.	2	K2	CO3

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Sketch and explain the four basic robot configurations classified according to the coordinate system.	11	K2	CO1
		OR			
	b)	Explain about robot centered work cells with suitable diagram and illustrations.	11	K2	CO1
24.	a)	List down and explain the factors influencing the choice of a robot in an industry.	11	K2	CO2
		OR			
	b)	Elaborate the construction, working principle of end effectors for spray painting robots.	11	K2	CO2
25.	a)	Demonstrate the working and features of ASRS with suitable example.	11	K3	CO3
		OR			
	b)	Compute various types of AGVs with neat sketches.	11	K3	CO3
26.	a)	Explain in detail about lead through programming.	11	K2	CO4
		OR			
	b)	Justify the needs of Robot in welding with a suitable industrial example.	11	K2	CO4
27.	a)	Explain the working of Cartesian PCB Robot with a neat sketch.	11	K2	CO5
		OR			
	b)	Elaborate the applications of Robot in packaging with suitable program and example.	11	K2	CO5
28.	a)	Explain the various components of a robot with a neat sketch.	11	K2	CO1
		OR			
	b)	Enumerate the various needs and requirements of FMS in industrial scenario.	11	K2	CO1