GYANMANJARI INNOVATIVE UNIVERSITY

GYANMANJARI INSTITUTE OF TECHNOLOGY

M. Tech.-End Semester Examination (ESE)- Summer-2026

Enrollment No.
Subject Code: METAI12509
Subject Name: Artificial Intelligence for Robotics
Time: 10:30 AM to 01:30 PM

Date: 14-05-2026
Semester: 02
Total Marks: 100

Instructions:

1. **Question No. 1 is compulsory.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			Marks
Q.1	(a)	Explain the history and evolution of robotics. Discuss major milestones leading to modern intelligent robots.	10
	(b)	Explain different types of grippers and discuss important design considerations for grippers.	10
Q.2	(a)	Explain Breadth First Search (BFS) and Depth First Search (DFS) with examples.	10
		OR	
	(a)	Discuss ethical issues and safety standards in modern robotics.	10
	(b)	Discuss robot programming commands such as WAIT, SIGNAL, DELAY, and branching limitations.	10
		OR	
	(b)	Explain lead-through programming and motion interpolation techniques in robots.	10
Q.3	(a)	Analyze recent trends in robotics including collaborative robots (cobots) and autonomous systems.	10
	(b)	Explain robot cell design, safety considerations, and layout planning.	10
		OR	
Q.3	(a)	Perform force analysis of mechanical and hydraulic gripper systems with neat diagrams.	10
	(b)	Explain Denavit - Hartenberg (D-H) parameters and their role in robot kinematics. Illustrate with an example.	10
Q.4	(a)	Discuss various robot sensors including tactile, proximity, and range sensors. Explain their working principles.	10
	(b)	Discuss constraint satisfaction problems and means-ends analysis with examples.	10
		OR	
Q.4	(a)	Explain robot programming languages and their structure.	10
	(b)	Discuss production systems and their role in AI problem solving.	10
Q.5	(a)	Explain robotic vision system, image acquisition, and image segmentation techniques.	10
	(b)	Discuss trajectory generation and robot dynamics with suitable examples.	10
		OR	
Q.5	(a)	Discuss various industrial applications of robots such as material handling, assembly, and inspection.	10
	(b)	Describe the classification of robots based on structure and application with suitable examples.	10