



Paper ID : 261320

Printed Page: 1

Subject Code:BME061

Roll No:

BTECH

(SEM. VI) THEORY EXAMINATION 2025-26

INDUSTRIAL ROBOTICS

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief.

02 x 7 = 14

Q no.	Question	CO	Level
a.	Define robotics and explain any two components of a robotic system	1	K2
b.	Explain the concept of robot accuracy and repeatability with suitable distinction.	2	K2
c.	Define robotic gripper and explain its role in material handling applications.	2	K2
d.	What are sensors in robotics? Explain their importance in robot control.	2	K2
e.	Define actuator and explain its function in a robotic drive system.	3	K2
f.	What is robot programming? Explain any one command such as WAIT or DELAY.	4	K2
g.	Explain the need of safety measures and Artificial Intelligence in modern robotics.	5	K2

SECTION B

2. Attempt any *three* of the following:

07 x 3 = 21

Q no.	Question	CO	Level
a.	Analyze the effect of Degree of Freedom on robot work envelope and flexibility. Also classify robots based on configuration.	1	K4
b.	Design a suitable gripper system for handling fragile glass objects in an automated production line. Justify the type of gripper selected.	2	K5
c.	Compare hydraulic, pneumatic, and electric drives used in robotics. Also analyze their suitability for different industrial applications.	3	K4
d.	Develop a robot program to perform a pick-and-place operation using basic commands, subroutines, and signals.	4	K3
e.	Evaluate the impact of robotization on society and industry. Discuss safety standards and explain how Artificial Intelligence is transforming modern robotic systems.	5	K5

SECTION C

3. Attempt any *one* part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Explain the concept of automation in robotics. Explain types and levels of automation. Also evaluate its role in improving industrial productivity.	1	K5
b.	Describe the elements of a generalized robotic system and examine the role of each element in achieving efficient robot operation in industry.	1	K4



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4. Attempt any *one* part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Classify different types of sensors used in robotics and analyze how their characteristics influence performance in dynamic industrial environments	2	K4
b.	Discuss the role of machine vision systems in robotics and evaluate their advantages and limitations in automated manufacturing.	2	K5

5. Attempt any *one* part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Explain different types of control systems used in robotics. Analyze the advantages of closed-loop control over open-loop systems in industrial applications.	3	K4
b.	Analyze the sources of errors in robotic drive systems and suggest methods to minimize these errors for improved performance.	3	K5

6. Attempt any *one* part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Compare different robot programming methods. Analyze their advantages and limitations in industrial applications.	4	K4
b.	Explain the evolution of robotic programming languages from early systems to modern platforms. Also evaluate their impact on industrial automation.	4	K5

7. Attempt any *one* part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Explain different types of mobile robot locomotion i.e. wheeled, legged, hopping etc. Also compare their stability, maneuverability, and controllability.	5	K4
b.	Discuss recent trends and emerging technologies in robotics, and evaluate their impact on future industrial applications.	5	K5