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**BTECH**  
**(SEM IV) THEORY EXAMINATION 2023-24**  
**AUTOMATION AND ROBOTICS**

TIME: 3 HRS

M.MARKS: 70

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

## SECTION A

1. Attempt all questions in brief. 2 x 7 = 14

a.	What are the different levels of automation?
b.	What is the role of automation in Industry 4.0?
c.	What is the meaning of payload capacity of a robot?
d.	What is sensor?
e.	What is a hard wire system?
f.	What is group technology?
g.	What are the benefits of using robots in welding?

## SECTION B

2. Attempt any three of the following: 7 x 3 = 21

a.	Explain the working of (a) Closed loop (b) Open loop system work.
b.	Discuss the advantages and limitations of robot application in industry.
c.	Explain the different types of sensors required in a humanoid robot.
d.	Discuss the different components of computer integrated manufacturing.
e.	What are the medical applications of automation and robotics?

## SECTION C

3. Attempt any one part of the following: 7 x 1 = 7

(a)	Explain any three situations in which manual labor is preferred over automation.
(b)	What is the USA Principle? What does each of the letters stand for? Explain with example.

4. Attempt any one part of the following: 7 x 1 = 7

(a)	What are the different types of joints used in robots? Explain with sketch.
(b)	Explain: (a) Forward Kinematics (b) Inverse Kinematics

5. Attempt any one part of the following: 7 x 1 = 7

(a)	What are some basic logic functions in ladder programming?
(b)	What is the function of an actuator? Classify and explain the different type of Actuator.

6. Attempt any one part of the following: 7 x 1 = 7

(a)	Explain the three capabilities that a manufacturing system must possess to be flexible?
(b)	Explain the five functions of the material handling and storage system in a flexible manufacturing system?

7. Attempt any one part of the following: 7 x 1 = 7

(a)	What will be the implications of using robots for household tasks in India? How will it impact society?
(b)	Create a work cell for a robot to address a specific problem you aim to solve using the robot.