

Name:		Printed Pages:	
Student University Roll No.:			
<p align="center">School of Engineering Second Theory Sessional Examination Odd Semester (AS: 2024-25)</p>			
B. Tech: CS(AI)		[Year:] 2 nd	[Semester:] III rd
Course Title: AI in ME Systems		Max Marks: 30	
Course Code: NAI4302		Time: 1hr	
<i>Instructions if any: Read the question Carefully.</i>			
SECTION 'A'		Course Objective	Marks
Q.N.1. Attempt all parts of the following:			
a)	Explain two benefits of AI in Mechanical Engineering systems.	CO3	1
b)	Define Joints of a Robot.	CO3	1
c)	Write one industrial application of 3D printing.	CO4	1
d)	Define machine vision.	CO3	1
e)	Define Snake Arm Robot.	CO4	1
SECTION 'B'		Course Objective	Marks
Q.N.2. Attempt any two parts of the following:			
a)	What is an Expert System ? What are the components of Expert System.	CO3	7.5
b)	Explain Sensors and Actuators and their types.	CO4	7.5
c)	Identify the Five Levels of Automation in a production plant.	CO3	7.5
SECTION 'C'		Course Objective	Marks
Q.N.3. Attempt any one part of the following:			
a)	Define AI in Manufacturing Sector-Industry 4.0.	CO4	10
b)	Define 3D printing and explain its steps.	CO4	10
c)	What is the difference between open control and closed loop control system.	CO3	10

Table 1: Mapping between COs and questions
(Number of COs may vary from course to course)

COs	Questions Numbers	Total Marks
CO3	Q.no1(a,b,d)Q.no2(a,c)Q.no3(c)	28

No. of Printed Pages : 03

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 43901

Roll
No.

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B. Tech. Examination, 2024-25

(Odd Semester)

**ARTIFICIAL INTELLIGENCE IN MECHANICAL
ENGINEERING SYSTEMS**

Time : Three Hours]

[Maximum Marks : 60

Note :- Attempt all questions.

SECTION - A

1. Attempt all parts of the following : $8 \times 1 = 8$

- (a) What is an end effector?
- (b) Define machine learning.
- (c) What is actuator?
- (d) What is fixed routing?
- (e) Define automation.

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- (f) What is CAPP?
- (g) Define AI in banking sector.
- (h) Define tachometer.

SECTION – B

2. Attempt any two parts of the following : $2 \times 6 = 12$
- (a) Explain the five levels of automation and control in manufacturing.
 - (b) What is the role of artificial intelligence in thermal powerplants? Explain in detail.
 - (c) Describe knowledge acquisition and how it is useful in artificial intelligence system.
 - (d) Explain the types of joints with diagrams.

SECTION – C

Note :- Attempt all questions. Attempt any two parts from each questions. $8 \times 5 = 40$

- 3. (a) Explain error detection and recovery and types of error recovery.
- (b) Define analog-digital converters.

- (c) What is an expert system?
- 4. (a) Explain the working of articulated robot and SCARA with diagram.
- (b) Define MRP and explain how it works?
- (c) How does adaptive control work?
- 5. (a) Define actuators according to the type of drive power.
- (b) Differentiate between machine learning and data mining.
- (c) Discuss the role of AI in manufacturing sector.
- 6. (a) Define the following :
 - (i) Tactile sensors
 - (ii) Proximity sensors
 - (iii) Optical sensors
- (b) Define the architecture of expert system.
- (c) Define additive manufacturing and how does 3D printing works?
