

Name:

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Student University Roll No.:

School of Engineering

Second Sessional Examination, Odd Semester (AS: 2023-24)

B. Tech: AI, CCML, IOTBC

Year: 2ndSemester: 3rd

Course Title: AI in Mechanical Engineering

Max Marks: 60

Course Code: BAI3302

Time: 3 hr

*Instructions if any: Read the question Carefully.***SECTION 'A'**

Q.N.1. Attempt all parts of the following:

		Cour se Obje ctive	Mar s
a)	What is Machine Learning.	CO3	1
b)	What do you mean by CAD.	CO3	1
c)	Explain types of Mechanical Engineering Systems (MES)	CO1	1
d)	How may axis do Cartesian coordinate Robot work.	CO3	1
e)	Explain three benefits of AI for Mechanical Engineering systems	CO1	1
f)	Explain Joints and Links of a Robot.	CO3	1
g)	Write one industrial manufacturing use of 3D printing	CO4	1
h)	Explain application of Machine vision sensors.	CO2	1

SECTION 'B'

Q.N.2. Attempt any two parts of the following:

a)	What are the five joint types used in Robotic arms and wrists with neat sketches?	CO3	6
b)	Explain Basic Elements of an Automated System in detail.	CO2	6
c)	What is an expert system. What are the components of Expert System.	CO3	6
d)	What is Adaptive Control. How it is useful for implementing AI in any system.	CO3	6

SECTION 'C'

Q.N.3. Attempt any Two parts of the following:

a)	What are Advanced Automation Functions.	CO2	5
b)	What is safety monitoring in an Automated system.	CO2	5
c)	Explain CAPP and MRP using block diagrams.	CO3	5

Q.N.4. Attempt any Two parts of the following:

a)	What is the role of AI in thermal power plant.	CO3	5
b)	What do you mean by Input/Output Interfaces	CO2	5
c)	What is Additive Manufacturing Process. What are the different processes.	CO4	5
Q.N.5. Attempt any Two parts of the following:			
a)	Explain human like machine vision with examples.	CO3	5
b)	Identify the five levels of automation in a production plant.	CO2	5
c)	What is the difference between a closed-loop control system and an open- loop control system.	CO3	5
Q.N.6. Attempt any Two parts of the following:			
a)	Explain in detail about. 1) Tactile Sensors. 2) Proximity Sensors. 3) Optical Sensors.	CO3	5
b)	What is automation, name the three basic elements of an automated system.	CO2	5
c)	Define Analog-Digital Conversions. Explain it with diagram.	CO2	5

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

COs	Questions Numbers	Total Marks
CO1	1(a,c,e)	3
CO2	1(f), 2(b), 3(a,b), 4(b), 5(b), 6(b,c)	37
CO3	1(b,d,h), 2(a,c,d), 3(c), 4(a), 5(a,c), 6(a)	46
CO4	1(g), 4(c)	6