PVP 22

Code: 22MEMD2T2

I M.Tech - II Semester – Regular Examinations - JULY - 2023

AI AND ML OF MECHANICAL SYSTEMS
(MACHINE DESIGN)

Duration: 3 hours Max. Marks: 60

Note: 1. This paper contains 4 questions from 4 units of Syllabus. Each unit carries 15 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Discuss the general frame work of Industry 4.0 and its Needs.	L2	CO1	7 M
	b)	Explain how can you implement Industry 4.0?	L2	CO1	8 M
OR					
2	a)	Define centre limit theorem. Explain briefly the steps in deriving the centre limit theorem.	L2	CO1	7 M
	b)	Write briefly about correlation vs regression with its types?	L2	CO1	8 M
UNIT-II					
3	a)	State and explain the algorithm for Breath first search with an example.	L2	CO2	8 M
	b)	What is uniform cost search algorithm? Explain it with an example.	L2	CO2	7 M
OR					

4	a)	State and explain the algorithm for Depth first search with an example.	L2	CO2	7 M
	b)	Develop A* algorithm for AI applications.	L2	CO2	8 M
		UNIT-III			
5	a)	Cluster the following eight points (with (x, y) representing locations) into three clusters: A1(2, 10), A2(2, 5), A3(8, 4), A4(5, 8), A5(7, 5), A6(6, 4), A7(1, 2), A8(4, 9) Initial cluster centres are: A1(2, 10), A4(5, 8) and A7(1, 2). The distance function between two points $a = (x_1, y_1)$ and $b = (x_2, y_2)$ is defined as $P(a, b) = \|x_2 - x_1\| + \|y_2 - y_1\|$ Use K-Means Algorithm to find the three cluster centres after the second iteration.	L3	CO3	10 M
	b)	Write briefly about various non-linear regression models?	L2	CO3	5 M
		OR			
6	a)	Explain the difference between pooling and Padding Operations.	L2	CO3	7 M
	b)	Explain the different layers in Conventional neural Network?	L2	CO3	8 M
		UNIT-IV			
7	a)	Explain the Digital logic “Exclusive-OR” and “Exclusive-NOR” briefly and draw the circuit.	L2	CO4	8 M
	b)	Prove the statement $(p \rightarrow q) \leftrightarrow (\sim q \rightarrow p)$ is a tautology.	L3	CO4	7 M

OR					
8	a)	Prove the statement $(p \vee q) \wedge (\neg p) \wedge (\neg q)$ is a Contradiction.	L3	CO4	7 M
	b)	Convert the following sentence into predicate logic and then its clause form i. The-humidity-is-high ii. If the-sky-is-cloudy then it-will-rain iii. If the-humidity-is-high then it-is-hot. iv. It-is-not-hot. v. the-sky-is-cloudy	L3	CO4	8 M