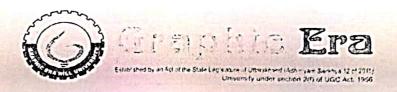
100

End Term (Odd) Semester Examination December 2024

	Roll no
Name of the Course and semester: MCA, 3 rd Sem Name of the Paper: Artificial Intelligence & Mach Paper Code: TMC-303	
Time: 3 hour	Maximum Marks: 100
Note: (i) All the questions are compulsory. (ii) Answer any two sub questions from a, b and (iii) Total marks for each question are 20 (twenty (iv) Each sub-question carries 10 marks.	l c in each main guestion
b. Define a rational agent in AI. What are the key from a simple reflex agent?	components of a rational agent, and how does it differ (CO1) example. How are problems represented in state space.
a. Define a production system. Discuss its componer manage rule execution in production systems. Provide b. Explain Constraint Satisfaction Problem (CSP)? E backtracking. Solve the given problem using CSP: (To. Describe Depth First Search (DFS). How does it does not complexity, and applications? Provide an example to	the an example to illustrate your explanation. (CO2) Explain with an example how CSPs can be solved using COM+NAG=GOAT) (CO2) iffer from BES in terms of implementation, time
way they learn from data and solve problems. b. Explain the difference between inferential and des	(2X10=20 Marks) I reinforcement learning. Analyze real-world scenarios earning is implemented. Discuss the differences in the (CO3) criptive models. Use real-world examples to illustrate on-making processes. Discuss the role of these models (CO3) echniques used in model fitting. Discuss methods like uning, and explain how they contribute to improving
Q4. a. Define regression analysis and differentiate it fi and methodologies. Illustrate the roles of depende an example.	(2X10=20 Marks) rom classification by comparing their objectives ent and independent variables in regression with (CO4)

b. The height details of the boys and girls are given in table:



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Height of the Boys (xi)	65	70	75	78
Height of the Girls (yi)	63	67	70	73

Fit a suitable line of best fit for the above data.

(CO4)

e. Explain the concept of a Support Vector Classifier (SVC) by evaluating its decision boundary using a dataset with two classes (+1 and -1). Illustrate the process of maximizing the margin with an example of random data points and discuss the significance of support vectors. (CO4)

Q5. (2X10=20 Marks)

- a. Explain the Apriori algorithm and its role in association rule mining. Evaluate its application in identifying frequent patterns within a dataset, and provide examples to support your explanation. (CO5) b. Define dimensionality reduction and analyze its benefits in data processing. Compare dimensionality reduction techniques, explaining how each technique works and its typical use cases. (CO5)
- c. Discuss the purpose of hierarchical clustering and the role of linkage criteria in creating clusters. Consider the similarity matrix given below:

	P1	P2	P3	P4	P5	P6
PI	1.00	0.70	0.65	0.40	0.20	0.05
P2	0.70	1.00	0.95	0.70	0.50	0.35
Р3	0.65	0.95	1.00	0.75	0.55	0.40
P4	0.40	0.70	0.75	1.00	0.80	0.65
P.5	0.20	0.50	0.55	0.80	1.00	0.85
P6	0.05	0.35	0.40	0.65	0.85	1.00

Show the hierarchy of clustering created by single-link technique.

(CO5)