T.E. Sem VI, IT AI&DS, C-scheme, 9/12/25, 9/12/2025, QPC 98146

(Time: 3 Hours) [Total Marks: 80]

N.B.
(1) Question No. 1 is compulsory
(2) Attempt any three questions out of the remaining five questions
(3) Figures to the right indicate full marks
(4) Assume suitable data whenever required

Q1 a) Differentiate between Simple Reflex Agent and Model-Based Reflex Agent. 5M
b) Discuss Problem Formulation in AI with an example. 5M
c) Define heuristic search. Give two examples of heuristic functions. 5M
d) Describe the process of knowledge representation using First Order Logic. 5M

Q2 a) What are Supervised Machine Learning techniques? Explain Logistic Regression technique. What makes it a Supervised learning technique? 10M
b) Compare and contrast univariate and multivariate EDA with suitable examples. 10M

Q3 a) Explain the basic steps in developing a Machine Learning application. 10M
b) Explain the importance of graphical methods in EDA. 10M

Q4 a) Describe in detail the stages in the Data Science Lifecycle. 10M
b) Discuss Partial Order, Hierarchical, and Conditional Planning. 10M

Q5 a) Compare and contrast Data Science, Business Analytics, and Big Data with examples. 10M
b) Define Unsupervised Machine Learning techniques. Discuss K-Means and Hierarchical Clustering in detail. 10M

Q6 a) What do you mean by covariance and correlation? Explain their interpretation and the range of coefficients. 10M

Experiment No.	1	2	3	4	5	6	7	8	9	10
X (Variable 1)	10	12	15	18	20	22	25	30	35	40
Y (Variable 2)	8	11	14	17	21	24	28	32	36	39

For the above data, calculate Covariance (COV) and Correlation Coefficient (CORR) between X and Y. Interpret your results.
b) Explain the working of the Hill Climbing algorithm. What are issues in Hill Climbing? 10M

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