IN-SEMESTER EXAMINATION-I

TT (Semester-VI)

SUBJECT – OE-I (Introduction to Artificial Intelligence and Data Science)

Branch: AI&DS
Div.: ALL
Duration: 60 Minutes

Date: 09/03/2026
Timing: 2:00 pm to3:00 pm
Maximum Marks: 20

Instructions –

1. All questions are compulsory.
2. Assume suitable data wherever necessary and state the assumptions made.
3. Diagrams / sketches should be given wherever necessary.
4. Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5. Figures to the right indicate full marks.

Q.1		Answer any 5 of the following questions	Marks	Course Outcomes	Learning Levels
	a.	Explain the concept of an intelligent agent and give an example of its application.	2	CO1	U
	b.	What is a feature in Data Science? Explain how it is used in a dataset.	2	CO1	U
	c.	Define Data Science and mention any two key terminologies with examples.	2	CO1	R
	d.	Examine how standardization and normalization affect real-time machine learning models.	2	CO2	A
	e.	Differentiate between structured and unstructured data, giving examples from a real dataset.	2	CO2	U
	f.	Explain what multicollinearity is and how it can impact data analysis.	2	CO3	R
	g.	Identify any two causes of outliers in datasets and briefly explain their effects.	2	CO3	R
Q.2	a.	Demonstrate how EDA can be used on a loan approval system's data to identify biases, and explain the implications for analysis	5	CO2	A
		OR			
	b.	Evaluate the role of data standardization in machine learning applications and analyze its effect on model training and prediction performance.".	5	CO2	AN
Q.3	a.	Compare and critically evaluate various methods for outlier detection, discussing how selecting a particular method can affect data insights and analysis reliability	5	CO3	AN
		OR			
	b.	Illustrate the steps of factor analysis and describe how each step contributes to analysing relationships among variables.	5	CO3	A

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IN-SEMESTER EXAMINATION-II

TT (Semester-VI)

SUBJECT – OE-I-(Introduction to Artificial Intelligence and Data Science)

Branch: AI&DS
Div.: ALL
Duration: 60 Minutes

Date: 24/04/2026
Timing: 12:00 pm to 1:00 pm
Maximum Marks: 20

Instructions –

1. All questions are compulsory.
2. Assume suitable data wherever necessary and state the assumptions made.
3. Diagrams / sketches should be given wherever necessary.
4. Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5. Figures to the right indicate full marks.

Q.1		Answer any 5 of the following questions	Marks	Course Outcomes	Learning Levels
	a.	Illustrate the use of a count plot in Exploratory Data Analysis (EDA) on any dataset and explain how it helps in understanding the distribution of categorical data.	2	CO4	A
	b.	Identify the type of data best represented using a histogram and justify its suitability for that data.	2	CO4	U
	c.	Discuss the benefits of data visualization and how they contribute to effective data-driven decision making.	2	CO4	A
	d.	Analyze the working of Depth First Search (DFS) and explain why it may fail to find optimal solutions in certain problem spaces.	2	CO5	AN
	e.	Explain the role of heuristic functions in A* search and describe how they influence search efficiency and optimality.	2	CO5	A
	f.	Compare the differences between local and global food systems and illustrate their key characteristics in terms of production, distribution, and consumption.	2	CO6	AN
	g.	Apply data science techniques to demonstrate how data collection improves agricultural decision-making.	2	CO6	A
Q.2	a.	Examine the steps of a problem-solving agent for the 8-puzzle problem by explaining how it defines the state space, initial state, goal state, and applies operators to reach the solution	5	CO5	A
		OR			
	b.	Analyze Breadth First Search (BFS) to a simple graph problem and illustrate step-by-step node expansion. why BFS guarantees optimal solutions in unweighted graphs.	5	CO5	AN

END SEMESTER EXAMINATION, May 2026 29 MAY 2026
T.T. SEMESTER VI (CBCGS-HME 2023)

Branch:	**ALL**	Q.P. Code:	T654RM265-OE-1-6-2
Subject:	**OE I- (AI and Data Science)**	Duration:	2 hours
Subject Code:	OEX-601X	Max. Marks:	60

Instructions: **1. All sections are compulsory**
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary and state the assumptions clearly.

Section-I **Short Answer Questions (Answer any 05 questions out of 06)** (10 Marks)
(Fundamental, Core Types)

Q. No.		Marks	CO	RBT Level	PI
1	Analyze the concept of features and examine how they are used in machine learning models.	2	CO1	AN	3.1.1
2	Evaluate the strategy of removing rows with missing values in a customer dataset and identify one major drawback of this approach	2	CO2	AN	2.1.3
3	Analyze a dataset to determine any two possible causes of outliers and explain how these unusual values can influence the interpretation of the data.	2	CO3	AN	3.1.1
4	Demonstrate how a histogram can be used to represent the type of data most suitable for this graphical method, and justify why it effectively displays the distribution of that data.	2	CO4	A	2.1.3
5	Distinguish the role of heuristic functions in A* search and describe how they influence search efficiency and optimality.	2	CO5	AN	3.1.1
6	Illustrate the impact of climate change on agriculture and examine its effect on food security.	2	CO6	AN	3.1.1

Section-II **Descriptive Answer Questions (Answer any 04 out of 06)** (20 Marks)
(Descriptive, Comprehension Types)

1	Utilize the Data Science workflow to show how each stage contributes to solving data-driven problems, emphasizing the role of data preparation and analysis.	5	CO1	A	2.1.3
2	A startup removes rows with missing values and notices a decline in model accuracy. Implement suitable preprocessing methods to improve data quality and model performance.	5	CO2	A	3.1.1
3	Determine and explain the various methods used for the detection of outliers in a dataset, and discuss how each method helps in identifying unusual data points during data analysis.	5	CO3	AN	2.1.3
4	Apply appropriate data visualization techniques for both categorical and numerical data. Justify your choice of plots with suitable examples.	5	CO4	A	3.1.1
5	Apply hill climbing algorithm to an optimization problem and demonstrate how local maxima and plateau conditions affect solution quality.	5	CO5	A	2.1.3
6	Investigate the challenges in feeding a growing population such as climate change, water scarcity, and food wastage, and analyze their impact on agriculture.	5	CO6	AN	2.1.3

Section-III	Long Answer Question (Answer any 03 out of 05) (Application, Analytical, Evaluation, Design Type)				(30 Marks)
1	A smart-healthcare system relies on patient data for decision-making. Examine how improper Exploratory Data Analysis can affect ethical considerations, safety outcomes, and system reliability.	10	CO2	AN	2.2.1
2	Illustrate the complete factor analysis procedure, including assumptions, extraction methods, and interpretation of factors.	10	CO3	A	3.1.1
3	Construct a visualization-based approach for improving machine learning model performance by selecting features, analyzing errors, and validating the model. Explain and justify each step.	10	CO4	C	3.1.1
4	Compare and contrast informed and uninformed search techniques using examples such as BFS, DFS, and A*. Justify the selection of appropriate algorithms for real-world problems.	10	CO5	AN	2.1.3
5	A farming community is facing declining crop yield due to unpredictable weather conditions, inefficient resource utilization, and lack of proper decision-making strategies. The farmers have access to data from soil sensors, weather stations, and market trends. Use appropriate data-driven techniques such as precision agriculture and predictive analytics to improve agricultural productivity and resource management in this scenario.	10	CO6	A	3.1.1