

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May-June 2024

(B. Tech) Program: Information Technology	Scheme: II
Course Code: ITC604 and Date of Exam: 22/05/2024	Course Name: Artificial Intelligence and Data Science - I Duration: 2.5 Hours Max. Marks: 60

Instructions:
 All questions are compulsory.
 Draw neat diagrams wherever applicable.
 Use suitable data, if necessary.

Ques. No.	Question	Max. Marks	CO	BT level
Q1)	Solve any six questions out of eight:	12		
i)	Define the term AI. List down all components of AI.	2	CO1	U
ii)	Sketch the Lifecycle of Data Science Process.	2	CO4	A
iii)	Classify the Constraint and Unconstraint Optimization.	2	CO6	U
iv)	Demonstrate various levels of knowledge-Based Agents.	2	CO3	A
v)	Demonstrate Adversarial Machine Learning.	2	CO5	A
vi)	Illustrate Properties of differential privacy.	2	CO5	A
vii)	Illustrate Uninformed search strategies and list its types.	2	CO2	A
viii)	Sketch the basic building block of a Learning Agent.	2	CO2	A
Q2)	Solve any four questions out of six.	16		
i)	State the differences between Goal Based Agents and Utility Based Agent.	4	CO1	U
ii)	Sketch the state space tree for Water Jug problem.	4	CO2	A
iii)	Translate the following sentences into First Order Predicate Logic Form: <ul style="list-style-type: none"> • Every student smiles. • Every student except George smiles. • Everyone walks or talks. • Some humans are intelligent. 	4	CO3	A
iv)	Demonstrate the applications of Supervised ML in Modern Businesses.	4	CO4	A
v)	Demonstrate Adversarial Machine Learning with respect to Model Poisoning and Evasion Attack techniques.	4	CO5	A
vi)	Explain Non-Gradient Techniques in detail.	4	CO6	U
Q3)	Solve any two questions out of three.	16		

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i)	Write PEAS descriptions for: <ul style="list-style-type: none"> • A music composer. • Internet Shopping Agent. • An aircraft auto lander. • An essay evaluator. • A Vacuum Cleaner. • Automated Taxi Driver. 	8	CO1	U
ii)	Consider the Romania Map Problem given below. Assume that the initial state is Arad and goal state is Bucharest . Apply the Depth First Search strategy to find the path from initial state to the goal state. <div style="text-align: center; margin-top: 10px;"> </div>	8	CO2	A
iii)	Assume the following facts: <ul style="list-style-type: none"> • It is a crime for an American to sell weapons to the enemy of America. • Country Nono is an enemy of America. • Nono has some missiles. • All of its missiles were sold to Nono by Colonel West. • Missile is a weapon. • Colonel West is an American. • Prove the statement “West is a Criminal” using FC and BC Techniques. 	8	CO3	A
Q4)	Solve any two questions out of three.	16		
i)	How is Amazon Able to Recommend Other Things to Buy? How Does the Recommendation Engine Work?	8	CO4	A
ii)	Sketch and explain the mechanism to illustrate the coin flip with and without using Differential Privacy in Machine Learning.	8	CO5	A
iii)	Discuss the operating principles of Particle Swarm Optimization (PSO) algorithm along with one example.	8	CO6	U
