

Course Name: Artificial Intelligence

Course Outcomes (CO): At the end of the course the students should be able to:

1. Acquire advanced Data Analysis skills.
2. Stay Industry relevant and grow in your career.
3. Create AI/ML solutions for various business problems.
4. Build and deploy production grade AI/ML applications.
5. Apply AI/ML methods, techniques and tools immediately

Total duration(H:M): 03:00

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Maximum Marks:100

Q. No.	Questions	Marks	CO	PO	BL
1a.	Explain intelligence and artificial intelligence. How do they distinguish?	4	CO2	1	1
1b.	Explain knowledge acquisition in artificial intelligence.	6	CO4	3	3
1c.	For the set $S = \{ P \vee Q, \sim Q \vee R, \sim P \vee Q, \sim R \}$ i. Derive an empty clause from S by resolution. ii. Show that $(\exists z) (\forall x) [p(x) \rightarrow Q(z)]$ and $(\exists z) [(\exists x) p(x) \rightarrow Q(z)]$ are equivalent.	10	CO5	2	4
2a.	What is the environment in AI? Explain following. i. Fully Observable vs Partially Observable ii. Deterministic vs Stochastic iii. Competitive vs Collaborative	4	CO1	5	2
2b.	Explain the following with a diagram. i. Goal-Based Agents ii. Utility-Based Agents iii. Learning Agent	6	CO3	4	2
2c.	What is a heuristic function? Explain the best first search with an example.	10	CO5	2	3
3a.	Write the difference between informed and uninformed search.	4	CO2	3	3
3b.	What is A* search? Perform A* search on the graph given below. <div style="text-align: center;"> </div>	6	CO3	5	4
3c.	What is state space? Explain the state space search graph and state space trees with examples.	10	CO4	1	2
4a.	Write the difference Uniform cost search and Breath first search.	4	CO1	3	4

4b.	Explain in detail Bayesian theory and its use in AI. Define the like-hood ratio.	6	CO5	4	1
4c.	Determine whether the following PL formula is (a) Satisfiable (b) Tautology (c) Contingency i. $(p \wedge q) \rightarrow r \vee \sim q$ ii. $\sim p \wedge (p \vee q) \rightarrow q$ iii. $q \rightarrow \sim q \wedge (p \vee q)$	10	CO2	2	5
5a.	What is resolution in principle in propositional logic, explain?	4	CO3	4	1
5b.	What is probability reasoning? Why it is required in AI applications.	6	CO1	5	4
5c.	How is resolution in first-order predicate logic different from that of propositional performed? What are unification Algorithms & why it is required?	10	CO4	1	2
6a.	Write the difference between supervised and unsupervised learning.	4	CO2	3	4
6b.	What are Bayesian networks? Explain its importance with the help of an example.	6	CO4	4	1
6c.	Explain decision tree learning with a suitable example.	10	CO3	2	1
7a.	Write applications of expert systems.	4	CO1	5	2
7b.	Explain following. i. Perceptron Learning ii. Delta Learning	6	CO5	2	1
7c.	What is an expert system? Explain different parts of an expert system.	10	CO1	3	2
8a.	What artificial neural network? Write applications of it.	4	CO3	1	2
8b.	What is a genetic algorithm? Explain genetic algorithm operators and parameters.	6	CO3	5	3
8c.	Represent the following sentences in symbol logic. i. All students like good teachers. ii. All that glitters is not gold. iii. Fruits and vegetables are delicious. iv. God helps those who help themselves. v. Jack and Jill went up to the hills.	10	CO4	4	5

