Roll No							

End Semester Examination 2024

Name of the Course: BCA

Semester: 6

Name of the Paper: Fundamentals of Artificial Intelligence

Paper Code: TBC 604(3)

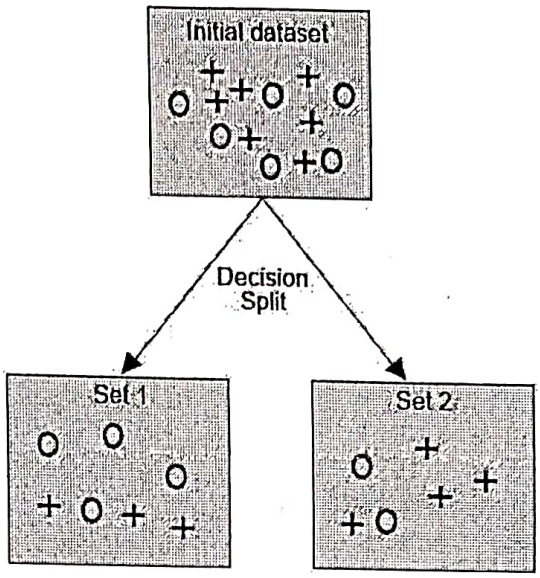
Time: 3 Hour's

Maximum Marks: 100

Note:

(i) All Questions are compulsory.
(ii) Answer any two sub questions among a,b and c in each main question.
(iii) Total marks in each main question are twenty.
(iv) Each question carries 10 marks.
(v) Calculators are allowed for this paper.

Q1	**(10 X2 = 20 Marks)**	**CO1**
(a)	What are the different definitions of AI? Which is the correct definition and why is it the most appropriate definition for AI?	
(b)	What are the different ways to represent Environment states? Explain each representation in detail.	
(c)	What do you mean by a well-defined problem? Explain the components of the N Queens problem.	
Q2	**(10 X2 = 20 Marks)**	**CO2**
(a)	Explain the Hill climbing algorithm in detail. What are the drawbacks of the algorithm?	
(b)	Differentiate between the Evaluation functions of the Greedy search algorithm and the A* algorithm	
(c)	Explain the Min-max algorithm with a suitable example.	
Q3	**(10 X2 = 20 Marks)**	**CO3**
(a)	What do you mean by Knowledge-based agents? Differentiate between TELL and ASK functions.	
(b)	Prove the following using Resolution. Draw the resolution graph. • Sunny Λ Warm ⟶ enjoy • Rain ⟶ wet • Warm • Raining • Sunny	
(c)	Explain the following properties of the propositional logic sentences and the inference algorithm. a) Satisfiability b) Validity c) Entailment d) Soundness e) Completeness	
Q4	**(10 X2 = 20 Marks)**	

(a)	What do you mean by Entropy? Find the Entropy of the initial dataset, set 1 and set 2 in the figure given below. 	CO4
(b)	Using a Bayesian classifier predict if it is a Rainy day, then John should play Tennis or not based on the following training data	

1	Sunny	Yes
2	Overcast	Yes
3	Overcast	Yes
4	Sunny	No
5	Rain	No
6	Sunny	Yes
7	Rain	Yes

(c)	Compare and contrast the different types of Machine Learning techniques.	
Q5	**(10 X2 = 20 Marks)**	
(a)	Explain the SVM algorithm in detail. What is the role of support vectors in the algorithm?	CO5
(b)	Find the class label of the test data (5,7) using the KNN classifier. Assume the training data as given below and the value of K is 3.	

Point	Coordinates	Class Label
A1	(2,10)	C2
A2	(2, 6)	C1
A3	(11,11)	C3
A4	(6, 9)	C2
A5	(6, 5)	C1
A6	(1, 2)	C1

(c)	What do you mean by Patterns? Explain the common Pattern arrangements.	