Roll Number:

Thapar Institute of Engineering and Technology, Patiala
Department of Computer Science

BE: Auxiliary Exam
February 2024
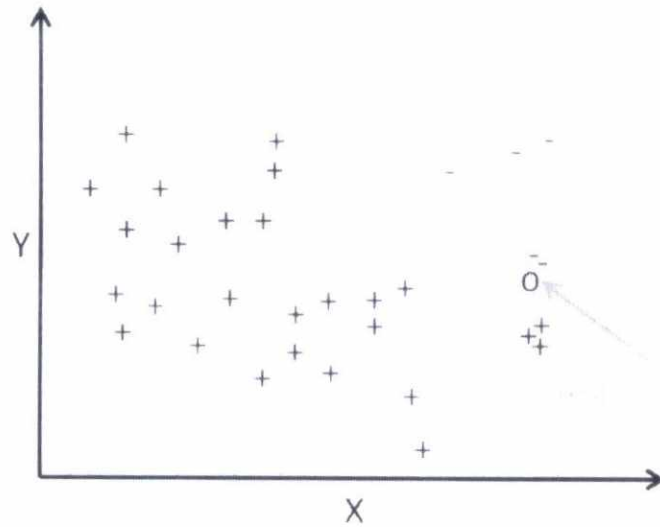Time: 3 Hours; M. Marks: *100*

UCS411: Artificial Intelligence

Faculty: Dr. Anu Bajaj

Note: All questions are compulsory

Q1	Draw diagrams of different types of Intelligent Agent architectures	(20)
Q2	Explain water – jug problem with rules and state space.	(20)
Q3	Apply alpha beta pruning on the following tree by showing all intermediate values. Consider root node as max node. Draw a cross on the pruned branches.	(20)
Q4	(i) Consider the following confusion matrix for some models on some dataset Predicted+ Predicted- True+ 200 10 True- 20 5 a) What is the macro precision of the model? Provide its formula and value. b) What is the macro recall of the model? Provide its formula and value. c) What is macro F1-score of the model? Provide its formula and value. (4+4+2=10) (ii) Suppose we have the following training set of positive (+) and negative (-) instances and a single test instance (o). All instances are projected onto a vector space of two real-valued features (X and Y). Answer the following questions. Assume "unweighted" KNN (every nearest neighbor contributes equally to the final vote). Distance between instances is measured using Euclidean distance. a) What class would be assigned to this test instance for K=1? b) What class would be assigned to this test instance for K=3? c) What class would be assigned to this test instance for K=5?		(20)

d)   Setting K to a large value seems like a good idea. We get more votes! Given this particular training set, would you recommend setting K = 11? Why or why not?(2+2+2+4)

| Q5 | What are different types of Knowledge representations? Explain any two. | (20) |