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Reg. No. : | | | | | | | | | | |

Question Paper Code: 96203

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Sixth Semester

Computer science and Engineering

19UCS603- ARTIFICIAL INTELLIGENCE AND MACHINE LERANING

(Regulations 2019)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (5x 1 = 5 Marks)

1. What is the heuristic function of greedy best-first search? CO1- U

   (a) f(n) != h(n) (b) f(n) < h(n) (c) f(n) = h(n) (d) f(n) > h(n)

2. What can be viewed as single literal of disjunction? CO1- U

   (a) Multiple clause (b) Combine clause

   (c) Unit clause (d) None of the mentioned

3. Which variable cannot be written in entire distribution as a table? CO3- U

   (a) Discrete (b) Continuous

   (c) Both Discrete & Continuous (d) None of the mentioned

4. Which of the following is the model used for learning? CO1- U

   (a) Decision trees (b) Neural networks

   (c) Propositional and FOL rules (d) All of the mentioned

5. K-means clustering algorithm is an example of which type of clustering method? CO1-U

   (a) Hierarchical (b) Partitioning (c) Density Based (d) Random

PART – B (5 x 3= 15Marks)

6. Differentiate uninformed and informed search strategies . CO1- U

7. Convert into CNF B2,1<=> (P1,1 V P2,2 V P3,1) CO2- App

8. List out the applications of Bayesian N/W? CO1- U

9. Mention the different forms of learning CO1- U

10. List out some applications of unsupervised learning. CO1- U

PART – C (5 x 16= 80Marks)

11. (a) Explain with neat diagram the four different types of agent programs CO1-U (16)

Or

(b) Explain in detail the uninformed search strategies and compare the analysis of various searches. CO1-U (16)

12. (a) Consider the following facts. CO2-App (16)

John likes all kinds of food
Apples are food
Chicken is food
Anything anyone eats and isn't killed by is food
Bill eats peanuts and is still alive
Sue eats everything bill eats.

(i) Transform these sentences into FOL
(ii) Arrange those into clause form.
(iii) Justify John likes peanuts by resolution.
(iv) Justify John likes peanuts by Backward Chaining.

Or

(b) Consider the following 5 facts that are added to a knowledge base in turn. Hobbit, CO2-App (16)

Hero, Hafling are predicates, FinalBattle is a function, Frodo and Mount Doom are

constants, and x and y are variables that are universally quantified.

1. Journey(Frodo, Mount Doom)
2. Hafling(x) → Hobbit(x)
3. Journey(x, y) → FinalBattle(x, y)
4. Hafling(Frodo)
5. Hobbit(x) ^ FinalBattle(x, Mount Doom)→ Hero(x)

(i) Show how forward chaining can be used to infer whether Frodo is a Hero (i.e.Hero(Frodo)) .

(ii) Show how backward chaining can be used to infer whether Frodo is a Hero (i.e. Hero(Frodo)).

(iii) Justify "Frodo is Hero" by resolution.

13.	(a)	(i) Explain Exact Inference in Bayesian Network with an example.	CO1-U	(8)
		(ii) Explain the process of Inference using full joint distribution with example.	CO1-U	(8)
		Or		
	(b)	(i) Describe a method for constructing Bayesian Networks	CO1-U	(8)
		(ii) Explain Variable elimination algorithm for answering queries on Bayesian networks	CO1-U	(8)
14.	(a)	Explain about Decision tree learning with an example	CO1- U	(16)
		Or		
	(b)	Explain about Artificial Neural network with an example	CO1- U	(16)
15.	(a)	Apply K-means clustering to the following 8 examples to convert into them into 3 clusters: A1=(2,10), A2=(2,5), A3=(8,4), A4=(5,8), A5=(7,5), A6=(6,4), A7=(1,2), A8=(4,9). Assume the initial seeds are A1,A4,A7.	CO2-App	(16)
		Or		
	(b)	Apply hierarchical clustering to the following 8 examples to convert into them into cluster: A1=(2,10), A2=(2,5), A3=(8,4), A4=(5,8), A5=(7,5), A6=(6,4), A7=(1,2), A8=(4,9).	CO2-App	(16)