VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN

[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]

Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5017

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – MAY / JUNE 2024

Fifth Semester

Computer Science and Engineering

U19CS519 – ARTIFICIAL INTELLIGENCE

(Regulation 2019)

Time : Three Hours   Maximum : 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What is "Artificial Intelligence? How to define a problem as state space search?	2	K2	CO1
2.	Compare and Contrast the uniformed and informed search.	2	K1	CO1
3.	For the given sentence "All Pompians were Romans" write a well formed formula in predicate logic.	2	K2	CO2
4.	What are the four properties for knowledge representation?	2	K2	CO2
5.	Compare production based system with frame based system.	2	K1	CO3
6.	Define Dempster-Shafter Theory and write the semantics of Bayesian network?	2	K1	CO3
7.	What are the differences and similarities between problem solving and planning?	2	K2	CO4
8.	Define Reinforcement Learning.	2	K1	CO4
9.	Sketch the Components of an Expert System Shell.	2	K2	CO5
10.	How meta knowledge is represented in rule-based expert systems?	2	K3	CO5

PART – B

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	Explain in detail, the structure of different intelligent agents with neat sketch.	7	K2	CO1
		ii.	Enumerate Classical "Water jug Problem". Describe the state space for this problem and also give the solution.	6		

(OR)

| | b) | i. | Discuss the Breadth First Search Technique with an example. | 7 | K2 | CO1 |
| | | ii. | Solve the following Crypt arithmetic problem using constraints satisfaction search procedure. | 6 | | |

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MONEY

| 12. | a) | i. | Trace the operation of the unification algorithm on each of the following pairs of literals: | 5 | K2 | CO2 |

     a. $f(Marcus)$ and $f(Caesar)$ $f(x)$ and $f(g(y))$

     b. $(Marcus, g(x,y))$ and $f(x, g(Caesar, Marcus))$

| | | ii. | Describe alpha-beta pruning and the Minmax game playing with an example. | 8 | | |

(OR)

| | b) | i. | Consider the following sentences | 7 | K2 | CO2 |

- 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

Translate these sentences into formulas in predicate logic and the resultant into clause form.

| | | ii. | Explain Resolution in brief with an example. | 6 | | |

| 13. | a) | i. | Elucidate the frame based knowledge representation techniques. | 7 | K2 | CO3 |
| | | ii. | Explain backward chaining with an example. | 6 | | |

(OR)

| | b) | i. | Explain forward chaining with an example. | 6 | K2 | CO3 |
| | | ii. | Discuss the Dempster-Shafer Theory with an example. | 7 | | |

| 14. | a) | Consider the problem of changing a flat tire. The goal is to have a good spare tire properly mounted onto the car's axle, where the initial state has a flat tire on the axle and a good spare tire in the trunk. To keep it simple, our version of the problem is an abstract one, with no sticky lug nuts or other complications. There are just four actions: removing the spare from the trunk, removing the flat tire from the axle, putting the spare on the axle and leaving the car unattended overnight. Write the STRIPS and find out the solution. | 13 | K3 | CO4 |

(OR)

| | b) | Reinforcement learning is an approach to machine learning and explain different types of reinforcement learning algorithms with real time examples. | 13 | K2 | CO4 |

| 15. | a) | Illustrate the architecture, characteristic features and roles of expert system with neat sketch. | 13 | K2 | CO5 |

(OR)

| | b) | Elucidate the need, significance and evolution of MYCIN expert system for Medical Diagnosis and Treatment. | 13 | K3 | CO5 |

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Illustrate what types of control strategy is used in the following problem with an example.	15	K3	CO1

    a.   The Tower of Hanoi
    b.   The Missionaries and cannibals problems
    c.   8-puzzle problem
    d.   Crypto-arithmetic

(OR)

| | b) | Design an expert system for Travel recommendation and discuss its roles with neat sketch. | 15 | K4 | CO5 |

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