VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD
Accredited by NAAC with A++ Grade
B.E. (C.S.E.) VI-Semester Main & Backlog Examinations, June-2022
Artificial Intelligence

Time: **3 hours**   Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any FIVE from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Define rational agent.	2	1	1	1,2
2.	Write the environment for the Automated Taxi driving	2	2	1	1,2
3.	What is the use of Min-Max algorithm?	2	2	2	1,2
4.	Find whether the given sentence is valid, satisfiable or neither (Smoke⇔ Fire) V (Smoke ∧ Heat => Fire)	2	2	2	1,2
5.	What are the different types of syntactic symbols of first order logic?	2	1	3	1,2
6.	State inference rules for quantifiers.	2	1	3	1,2
7.	How do you define a Map coloring as a constraint satisfaction problem?	2	2	4	1,2
8.	What is a planning graph?	2	1	4	1,2
9.	What does Bayesian network infer? Give example.	2	2	5	1,2
10.	How do you represent full joint distribution?	2	2	5	1,2

Part-B (5×8 = 40 Marks)

11. a)	Define and illustrate the idea of agent, agent function, and agent program by using vacuum cleaner problem.	4	3	1	1,2
b)	Draw the state space graph for the following instance up to level 4 using Depth limited search Start state 1 2 3 6 7 8 4 5 Goal state 1 2 3 4 5 6 7 8	4	3	1	1,2
12. a)	What is pruning? Explain Alpha-beta search algorithm with example.	4	2	2	1,2
b)	Explain Resolution in propositional logic with an example.	4	2	2	1,2
13. a)	Convert the given sentence into clausal form $$\forall x\big(P(X) \to Q(X)\big) \to \big((\exists X)P(X) \to (\exists X)(Q(X))\big)$$	4	3	3	1,2
b)	Distinguish forward and backward chaining methods for First order logic inference.	4	2	3	1,2

			M	L	CO	PO
14.	a)	Discuss in detail about constraint propagation for solving SEND + MORE=MONEY	4	3	4	1,2
	b)	Describe forward(progression) search through state space for a plan with block world example.	4	3	4	1,2
15.	a)	What is Baye's rule? State and prove Baye's theorem?	4	3	5	1,2
	b)	How to represent conditional distributions? Discuss?	4	1	5	1,2
16.	a)	Discuss in detail the graph search algorithm for searching solutions?	4	1	1	1,2
	b)	What is the next best move for the Max player in the TIC_TAC_TOE game from the following state. Apply the Alpha Beta cutoff while finding the solution and specify which all states need not be expanded .	4	1	2	1,2
17.		Answer any *two* of the following:				
	a)	Consider th following sentences	4	3	3	1,2
		Akhil likes all kinds of food. Apples are food. Anything anyone eats and is not killed is food. Rama eats peanuts and is still alive. Sita eats everything Rama eats. Use the first order logic resolution to prove that Akhil likes peanuts .				
	b)	Explain map coloring search with forward checking	4	3	4	1,2
	c)	An admission committee for a college is trying to determine the probability that an admitted candidate is really qualified. The relevant probabilities are given below. Draw the Bayesian network and calculate P(A/D)	4	3	5	1,2

For question 16 b):

o	x	

For question 17 c):

P(A)=1/2 ,   P(B/A)=1/2,   P(B/~A)=1/2,

P(C/A)=1,   P(C/~A)=1/2   P(D/B,C)= 1,   P(D/B, ~C)=1/2

P(D/~B,C)= ½, P(D/~B, ~C)=0 where

A=Application is qualified,

B=Applicant has high grade point average

C=Applicant has excellent recommendation

D= Applicant is admitted

M : Marks;   L: Bloom's Taxonomy Level;   CO; Course Outcome;   PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20
ii)	Blooms Taxonomy Level – 2	30
iii)	Blooms Taxonomy Level – 3 & 4	50

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