Priyadarshini College of Engineering, Nagpur
Sessional Examination (2022-23) Odd Semester
B.Tech.Fifth Semester (Computer Technology) (C.B.C.S.)
Artificial Intelligence

P. Pages: 2 **PCE/KW/22/BTCT505T**

Time: Three Hours **Max. Marks: 70**

Notes:
1. All questions carry marks as indicated.
2. Solve Question 1 or Question 2.
3. Solve Question 3 or Question 4.
4. Solve Question 5 or Question 6.
5. Solve Question 7 or Question 8.
6. Solve Question 9 or Question 10.
7. Due credit will be given to neatness and adequate dimensions.
8. Assume suitable data wherever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

Q. No.		Question	CO	BT	Marks
1.	a)	Explain the characteristics of AI problems with the help of suitable example.	CO1	II	7
	b)	Define control strategies ? State the requirements of good control strategies ?	CO1	I	7
		OR			
2.	a)	Discuss the various task domains of Artificial Intelligence with suitable examples.	CO1	II	7
	b)	You are given 4 gallon and 3 gallon water jugs. Both the jugs are initially empty. Neither of them has measuring mark on it. Apply state space search to find solution path from initial state to goal state where goal state is (2,0).	CO1	III	7
3.	a)	Differentiate between:- i) Procedural and declarative knowledge ii) Predicate logic and propositional logic iii) Forward and Backward reasoning.	CO2	II	7
	b)	Illustrate mean-end analysis with the help of robot example.	CO2	III	7
		OR			
4.	a)	Represent the following facts in FOPL and convert them into clause form. Use resolution technique to find that Ravi is spy. i) One of Raman, Ravi, Raghu and Ramesh is spy. ii) Raman is not spy. iii) Spies were light coloured dresses and do not attract attention of others. iv) Raghu was wearing a dark coloured suit. ii) Ramesh was the centre of attention of that evening.	CO2	III	9
	b)	State the various approaches to knowledge representation? Explain in detail.	CO2	I	5

Unified Resource Locator

Q. No.		Question	CO	BT	Marks
5.	a)	Use semantic net to represent the following statements i) Radha gave a book to Sita ii) Every dog in the city bites the constable	CO3	III	5
	b)	Explain the following :- i) Fuzzy logic ii) Certainty factor. iii) Monotonic reasoning with example.	CO3	II	9
		OR			
6.	a)	Explain the following. i) Scripts ii) Frames iii) Conceptual dependency.	CO3	II	9
	b)	State the importance of using Bayes theorem? Explain , the conditional probability,posterior probability and prior probability.	CO3	III	5
7.	a)	Describe the architecture of expert system with the help of block diagram	CO4	II	7
	b)	List the levels of NLP and explain each with suitable example.	CO4	II	7
		OR			
8.	a)	Explain minmax search procedure.	CO4	II	9
	b)	Explain the two basic parsing techniques & differentiate between them.	CO4	II	5
9.	a)	Define : i) Artificial Neural Network. ii)Genetic Algorithm. iii)Neural learning.	CO5	I	9
	b)	Explain various applications of ANN.	CO5	II	5
		OR			
10.	a)	Explain the following terms:- i) Genes ii) Chromosomes iii)Cost function.	CO5	II	9
	b)	List the genetic operators and explain each of them with suitable example.	CO5	II	5

PRIYADARSHINI COLLEGE OF ENGINEERING,NAGPUR

Department :- Computer Technology **Semester** :- V **Section** :- A / B

Session:- 2022-2023 (ODD-SEM)

CAT- 2

Subject :- AI **Subject Code**:- BTCT505T

Duration : 1.5Hrs **Max Marks**:- 35

Q No 1	Questions	M	CO	BL
i	For propositional Logic, which statement is false? * a. The sentences of Propositional logic can have answers other than True or False. b. Each sentence is a declarative sentence. c. Propositional logic is a knowledge representation technique in AI. d. None of the above	1	co3	I
ii	First order logic Statements contains_____. * a. Predicate and Preposition b. Subject and an Object c. Predicate and Subject d. None of the above	1	co3	I
iii	Differentiate between monotonic and non-monotonic reasoning systems.	5	co3	II
	OR			
Q No 2				
i	1. Which can be converted to inferred equivalent CNF sentence? a) Every sentence of propositional logic b) Every sentence of inference c) Every sentence of first-order logic d) All of the mentioned	1	co3	I,II
ii	2. What are Semantic Networks? a) A way of representing knowledge b) Data Type c) Data Structure d) None of the mentioned	1	co3	I,II
iii	Describe a script for restaurant.	5	co3	I,II
Q No 3				
i	Which of the following is an advantage of using an expert system development tool? a) imposed structure b) knowledge engineering assistance c) rapid prototyping d) all of the mentioned	1	co4	I,II
ii	Which of the following is not a Characteristics of Expert Systems? A. Understandable B. Highly responsive C. Unreliable D. High performance	1	co4	I,II
iii	Compare knowledge based expert system with rule based expert system.	5	co4	I,II
iv	Define expert system shell? Explain architecture of expert system.	7	co4	I,II
Q No 4				

i	A game can be formally defined as a kind of search problem with the following components. a) Initial State b) Successor Function c) Terminal Test d) All of the mentioned	1	co4	I,II
ii	General algorithm applied on game tree for making decision of win/lose is _____ a) DFS/BFS Search Algorithms b) Heuristic Search Algorithms c) Greedy Search Algorithms d) MIN/MAX Algorithms	1	co4	I,II
iii	a)Define NLP. Explain the following components of NLP. i) NLU (Natural Language Understanding) ii)NLG (Natural Language Generation)	5	co4	I,II
iv	List the levels of NLP and explain each with suitable example.	7	co4	I,II

Q No 5

i	Artificial neural network is used A) Classification for B)Clustering C) Pattern recognition D) All of the above	1	co5	I,II
ii	. __ is/are the ways to represent uncertainty A) Fuzzy logic B)Entropy C) Probability D)All of the above	1	co5	I,II
iii	Describe different applications of neural networks.	5	co5	I,II
iv	Define : i) Artificial Neural Network ii Genetic Algorithm.	7	co5	I II

OR

Q No 6

i	A Neural Network can answer A) For Loop questions B)what-if questions C) IF-The-Else Analysis Questions D)None of the mentioned	1	co5	I,II
ii	Artificial Neural Network is based on which approach? a) Weak Artificial Intelligence approach b) Cognitive Artificial Intelligence approach c) Strong Artificial Intelligence approach d) Applied Artificial Intelligence approach	1	co5	I,II
iii	Explain the following terms:- i) Genes ii) Chromosomes	5	co5	I,II
iv	List the genetic operators and explain each of them with suitable example.	7	co5	I II

UI

B.Tech. (Computer Technology) Fifth Semester (C.B.C.S.) Winter 2022

Artificial Intelligence

SPM/KW/22/2676

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1. a) Explain the term AI. Write the importance of AI & task domains of AI system. 7

   b) What is production system? Give the classification of production system. Explain it with examples. 7

OR

2. a) Explain the characteristics of AI problems with the help of suitable example. 9

   b) Draw & explain architecture of intelligent agents. 5

3. a) Differentiate between: 9

   i) Procedural & declarative knowledge.

   ii) Predicate & propositional logic

   iii) Forward & backward reasoning.

   b) Explain means – ends analysis with the help of robot example. 5

OR

4. a) Write & explain various steps used in conversion of Wffs into clause form. 5

   b) Use resolution technique to find Ravi is spy, using following sentences. 9

   i) One of Raman, Ravi, Raghu & Ramesh is spy.

   ii) Raman is not spy.

   iii) Spies wear light colored dresses & do not attract attention of others.

   iv) Raghu was wearing a dark coloured suit.

   v) Ramesh was the centre of attraction of that evening.

5. a) What is the importance of Bayes theorem? Explain, conditional probability posterior probability & prior probability. 5

b) Explain the following: 9

i) Frames

ii) Scripts

iii) Conceptual dependency

OR

6. a) Write short note on fuzzy logic. 7

b) Explain semantic networks with example. 7

7. a) Draw & explain the architecture of expert system. 7

b) Give & explain various knowledge levels using in natural language understanding. 4

c) What do you mean by NLP? 3

OR

8. a) Write a note on adding alpha-beta cutoffs. 7

b) What is parsing? Explain any two types of parsing in NLU. 4

c) Explain the importance of game playing in AI. 3

9. a) List the genetic operators & explain each of them with suitable example. 7

b) Explain the ANN. Also list the application of neural networks. 6

OR

10. a) Explain the life cycle of genetic algorithm. 7

b) Draw & explain the basic neuron model with example. 7

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