Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination May-2024

CB3CO14 Artificial Intelligence

Programme: B.Tech. Branch/Specialisation: CSBS

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. How an AI agent does interact with its environment? **1**

(a) Using sensors and perceivers (b) Using only sensors

(c) Using only perceivers (d) None of these

ii. What is state space? **1**

(a) The whole problem

(b) Your definition to a problem

(c) Problem you design

(d) Representing your problem with variable and parameter

iii. Which search is complete and optimal when h(n) is consistent? **1**

(a) Best-first search (b) Depth-first search

(c) Both (a) and (b) (d) A* search

iv. A* algorithm is based on- **1**

(a) Breadth-first-search (b) Depth-first –search

(c) Best-first-search (d) Hill climbing

v. Which values are independent in minimax search algorithm? **1**

(a) Pruned leaves x and y (b) Every states are dependant

(c) Root is independent (d) None of these

vi. What is the condition of Alpha Beta pruning? **1**

(a) Alpha >=Beta (b) Alpha <=Beta

(c) Alpha =Beta (d) Alpha >Beta

vii. When the forward chaining is stopped? **1**

(a) No further inference (b) Old facts recovered

(c) Intermediate goals achieved (d) None of these

viii. Which is not a property of representation of knowledge? **1**

(a) Representational verification (b) Representational adequacy

(c) Inferential adequacy (d) Inferential efficiency

P.T.O.

ix. What does the Bayesian network provide? **1**
(a) Partial description of the domain
(b) Complete description of the problem
(c) Complete description of the domain
(d) None of these

x. Which data structure we use in block word problem? **1**
(a) Heap (b) Linked list (c) Queue (d) Stack

Q.2 i. Discuss the applications of artificial intelligence. **2**
ii. What is production system? What are the characteristics of production system? **3**
iii. Explain various types of agents in AI. **5**
OR iv. Write the different between goal based agent and utility based agent. **5**

Q.3 i. What are the limitations of hill climbing method? 3
ii. Explain AO* algorithm with example. Under what situation it can be used. **7**
OR iii. Explain A* algorithm with example. **7**

Q.4 i. Explain alpha-beta cutoff with example. **4**
ii. Explain the constraint satisfaction problem. Solve the crypt arithmetic problem EAT + THAT = APPLE. **6**
OR iii. Explain min max procedure in game playing. Describe some of the refinement techniques used in minimax search procedure. **6**

Q.5 i. Write difference between forward and backward reasoning. **4**
ii. Explain different types of knowledge. **6**
OR iii. Consider the following sentences: **6**

I. Raj likes all kinds of food
II. Apples are food
III. Anything anyone eats and isn't killed by is food
IV. Sachin eats peanuts and is still alive
V. Vinod eats everything Sachin eats

Now, attempt following:
(a) Translate these sentences into formulas in predicate logic.
(b) Use resolution to answer the question, "What food does Vinod eat?"

Q.6 Attempt any two:
i. What is Bayesian network in AI? **5**
ii. What is Dempster-Shafer theory in artificial intelligence? **5**
iii. Discuss the block word problem and its solution. **5**

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Scheme of Marking
Artificial Intelligence-CB3CO14(T)

Q.1	i)	a) Using sensors and perceivers	**1**
	ii)	d) Representing your problem with variable and parameter	**1**
	iii)	d) A* search	**1**
	iv)	c) Best-First-Search	**1**
	v)	a) Pruned leaves x and y	**1**
	vi)	a) Alpha >=Beta	**1**
	vii)	a) No further inference	**1**
	viii)	a) Representational Verification	**1**
	ix)	c) Complete description of the domain	**1**
	x)	d) Stack	**1**

Q.2	i.	1 marks for each application
	ii.	Definition 1 marks, characteristics- 1 marks each
	iii.	Types of agents- 1 marks each
OR	iv.	1 marks for each difference
Q.3	i.	1 marks for each limitation
	ii.	AO* algo-3 marks, example 2 marks, usage-2 marks
OR	iii.	A* explain-2 marks, algorithm- 4 marks, example- 1 marks
Q.4	i.	Explanation-2 marks, example-2 marks
	ii.	Explanation-2 marks, solution-4 marks
OR	iii.	Minimax definition 2 marks, example 2 marks, refinements-3marks
Q.5	i.	1 marks for each difference
	ii.	1 marks for each type
OR	iii.	i-3 marks, ii- 3 marks

Q.6

	i.	Initial and goal-2 marks, solution-3 marks
	ii.	Explanation-5 marks
	iii.	Explanation-5 marks

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