

Enrollment No.....



Faculty of Engineering / Science

End Sem Examination May-2024

CA5EL04 Artificial Intelligence

 Programme: MCA / BCA- Branch/Specialisation: Computer
 MCA (Integrated) Application
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. Which of the following is not an application of artificial intelligence? **1**
 (a) Natural language processing
 (b) Digital assistant
 (c) Computer vision
 (d) Database management system
- ii. What are the approaches to AI? **1**
 (a) Strong AI (b) Weak AI (c) Applied AI (d) All of these
- iii. Out of the given option which uses least memory? **1**
 (a) DFS (b) BFS
 (c) Both are same (d) Cannot be compared
- iv. Blind search can be used for which of the following situations? **1**
 (a) Real life simulation (b) Small search space
 (c) Advanced game theory (d) None of these
- v. The knowledge approach that represents knowledge in the form of formal logics is known as: **1**
 (a) Inheritable knowledge (b) Simple relational knowledge
 (c) Inferential knowledge (d) Procedural knowledge
- vi. Which is not a property of representation of knowledge? **1**
 (a) Representational verification
 (b) Representational adequacy
 (c) Inferential adequacy
 (d) Inferential efficiency
- vii. Which value is assigned to alpha and beta in the alpha-beta pruning? **1**
 (a) Alpha = max (b) Beta = min
 (c) Beta = max (d) Both (a) and (b)

[2]

- viii. One of the earliest technique to be developed for solving compound goals that may interact was- **1**
- (a) Goal Stack planning
 - (b) Non-linear planning
 - (c) Hierarchical planning
 - (d) Meta planning
- ix. Mycin is an example of _____. **1**
- (a) Informed Search
 - (b) Planning
 - (c) Expert System
 - (d) Adversial Search
- x. Learn by example is called: **1**
- (a) Memorization
 - (b) Induction
 - (c) Deduction
 - (d) Rote learning

- Q.2 i. Define artificial intelligence. **2**
- ii. What are the 3 approaches to AI? Explain. **3**
- iii. What are the application areas of artificial intelligence? **5**
- OR iv. State out features of LISP programming. Describe any 4 basic list manipulation functions of LISP. **5**

- Q.3 i. What do you mean by heuristic search? Explain with example. **3**
- ii. Explain hill climbing algorithm with an example. **7**

- OR iii. Solve following 8-puzzle problem using A* algorithm. **7**
- Consider $g(n)$ =Depth of node, $h(n)$ = No. of misplaced tiles-

2	8	3
1	6	4
7		5

Initial state

1	2	3
8		4
7	6	5

Goal State

- Q.4 Attempt any two: **5**
- i. Explain forward and backward chaining with example. **5**
- ii. Explain inferential knowledge and procedural knowledge with example. **5**
- iii. Convert the following sentence to predicate logic- **5**
- (a) Sunil was intelligent
 - (b) All man drink coffee
 - (c) The ball color is red
 - (d) Someone is crying
 - (e) All Romans were either loyal to Caesar or hated him

[3]

- Q.5 i. What are the characteristics of game playing? **2**
- ii. Define planning. List the components of planning system. **3**
- iii. Explain alpha -beta cut-offs search algorithm with example. **5**
- OR iv. Explain goal stack planning with example. **5**
- Q.6 Attempt any two: **5**
- i. What are the different kinds of learning in AI? Explain in detail. **5**
- ii. Although we have human experts in every field, then what is the need to develop an expert system? **5**
- iii. Give structure of an expert system. Describe its components. **5**

Marking Scheme

Artificial Intelligence (T) - CA5EL04 (T)

- Q.1 i) Which of the following is not an application of Artificial intelligence? **1**
 Ans. d) Database management system
- ii) What are the approaches to AI? **1**
 Ans. d) All of the above
- iii) Out of the given option which uses least memory? **1**
 Ans. a) DFS
- iv) Blind search can be used for which of the following situations? **1**
 Ans. b) Small search space
- v) The knowledge approach that represents knowledge in the form of formal logics is known as : **1**
 Ans. c) Inferential knowledge
- vi) Which is not a property of representation of knowledge? **1**
 Ans. a) Representational Verification
- vii) Which value is assigned to alpha and beta in the alpha-beta pruning? **1**
 Ans. d) Both Alpha = max & Beta = min
- viii) One of the earliest technique to be developed for solving compound goals that may interact was **1**
 Ans. a) Goal Stack planning
- ix) Mycin is an example of _____ **1**
 Ans c) Expert System
- x) Learn by example is called: **1**
 Ans. b) Induction
- Q.2 i. Define Artificial Intelligence. **2**
 Definition 2 marks
- ii. What are the 3 approaches to AI? Explain. **3**
 Three approaches: Strong AI, Weak AI, Applied AI
 each 1 marks
- iii. What are the application areas of Artificial Intelligence? **5**
 At least 5 applications each 1 mark
- OR iv. State out features of LISP programming. Describe any 4 basic list **5**

manipulation functions of LISP.

Features of LISP

3 marks

4 manipulation function

2 marks (0.5 each)

- Q.3 i. What do you mean by Heuristic Search explain with Example. **3**
 Definition 1 marks
 Example 2 marks
- ii. Explain Hill climbing algorithm with an example **7**
 Algorithm 4 marks
 Example 3 marks.
- OR iii. **7**
- | | | |
|---|---|---|
| 2 | 8 | 3 |
| 1 | 6 | 4 |
| 7 | | 5 |
- Initial state
state
- | | | |
|---|---|---|
| 1 | 2 | 3 |
| 8 | | 4 |
| 7 | 6 | 5 |
- Goal
- Solve 8-puzzle problem using A* algorithm.
 Consider $g(n)$ = Depth of node
 $h(n)$ = No. of misplaced tiles
- Tree diagram 7 marks
- Q.4 i. Explain forward and backward chaining with example. **5**
 Forward chaining 2.5 marks
 Backward chaining 2.5 marks
- ii. Explain inferential knowledge and procedural knowledge with example. **5**
 Inferential knowledge 2.5 marks
 Procedural Knowledge 2.5 marks
- OR iii. Convert the following sentence to predicate logic - **5**
 (Each 1 mark)
- (i) Sunil was intelligent.
 (ii) All man drink coffee.
 (iii) The ball colour is red.
 (iv) someone is crying.
 (v) All Romans were either loyal to Caesar or hated him.

- Q.5 i. What are the characteristics of game playing? **2**
 At least two characteristics each 1 mark
- ii. Define planning? List the components of planning system? **3**

[2]

[3]

	Definition	1 mark	
	Components	2 marks	
iii.	Explain alpha -beta cut-offs search algorithm with example.		5
	Algorithm	2 marks	
	Example	3 marks	
OR	Explain Goal stack Planning with example.		5
	Goal stack planning	2 marks	
	Example	3 marks	
Q.6	Attempt any two:		
i.	What are the different kinds of learning in AI? Explain in detail.		5
	Kinds of learning	each 1 mark	
ii.	Although we have human experts in every field, then what is the need to develop a Expert system?		5
	At least 5 reasons	each 1 mark	
iii.	Give structure of an expert system, Describe its component.		5
	Structure diagram	2 marks	
	Component description	3 marks	
