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

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2018

CA5EL07 Artificial Intelligence

Programme: MCA Branch/Specialisation: Computer 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.

Q.1 i. LISP was created by: **1**

(a) John McCarthy (b) Marvin Minsky

(c) Alan Turing (d) Allen Newell and Herbert Simon

ii. What is Artificial intelligence? **1**

(a) Putting your intelligence into Computer

(b) Programming with your own intelligence

(c) Making a Machine intelligent

(d) Playing a Game..

iii. Which search method takes less memory? **1**

(a) Depth-First search (b) Breadth-First search

(c) Optimal search (d) Linear search

iv. A heuristic is a way of trying **1**

(a) To discover something or an idea embedded in a program.

(b) To search and measure how far a node in a search tree seems to be from a goal.

(c) To compare two nodes in a search tree to see if one is better than the other is

(d) All of these

v. How to eliminate the redundant rule matching attempts in the forward chaining? **1**

(a) Decremental forward chaining (b) Incremental forward chaining

(c) Data complexity (d) None of these

P.T.O.

vi. First Order Logic is also known as _____ **1**
(a) First Order Predicate Calculus (b) Quantification Theory
(c) Lower Order Calculus (d) All of these

vii. How the effectiveness of the alpha-beta pruning gets increased? **1**
(a) Depends on the nodes
(b) Depends on the order in which they are executed
(c) Both (a) and (b)
(d) None of these

viii. 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 Alpha = max & Beta = min

ix. Which of the following is an advantage of using an expert system development tool? **1**
(a) Imposed structure (b) Knowledge engineering assistance
(c) Rapid prototyping (d) All of these

x. What will take place as the agent observes its interactions with the world? **1**
(a) Learning (b) Hearing (c) Perceiving (d) Speech

Q.2 i. Is intelligence a single thing so that one can ask a yes or no question ``Is this machine intelligent or not? **3**

ii. What is AI? Explain different definition of AI with different application of AI. **7**

OR iii. What is LISP? How you will define global variable in LISP. Write the program to calculate area of circle. **7**

Q.3 i. Write Depth First Search Algorithm. **4**

ii. Write algorithm of Problem Reduction (AND-OR Graph) with diagram. **6**

OR iii. Trace the constraint satisfaction procedure for solving the following cryptarithmetic problem. **6**

CROSS.
\+ ROADS
DANGER

Q.4 Attempt any two:

i. Convert the following sentence to predicate logic (Any Five)- **5**
(a) Marcus was a man.
(b) Marcus was a Pompeian.
(c) All Pompeians were Romans.
(d) Caesar was a ruler.
(e) All Romans were either loyal to Caesar or hated him.
(f) Everyone is loyal to someone.
(g) People only try to assassinate rulers they are not loyal to.
(h) Marcus tried to assassinate Caesar.

ii. What are the essential characteristics of a knowledge representation system? Also write some common schemes of knowledge representation. **5**

iii. Give semantic network representation for the following facts- **5**
(a) Raja is a bank manager.
(b) Raja works in SBI located in MITM campus
(c) Raja is 26 years old
(d) Raja has blue eyes
(e) Raja is taller than Piyush.

Q.5 i. What are the components that are needed for representing a plan? **4**

ii. Explain alpha -beta cut-offs algorithm with example. **6**

OR iii. What are the game playing strategies? What are the major components of a game playing program. **6**

Q.6 Attempt any two:

i. Give structure of an expert system, explain its component. **5**

ii. What are the major application areas of an expert system? Also write down their various applications. **5**

iii. Name the various types of expert systems and explain any one of them in detail. **5**

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Marking Scheme
CA5EL07 Artificial Intelligence

Q.1 i. LISP was created by: 1
(a) John McCarthy

ii. What is Artificial intelligence? 1
(c) Making a Machine intelligent

iii. Which search method takes less memory? 1
(a) Depth-First Search

iv. A heuristic is a way of trying 1
(d) All of these

v. How to eliminate the redundant rule matching attempts in the forward chaining? 1
(b) Incremental forward chaining.

vi. First Order Logic is also known as _____ 1
(d) All of these

vii. How the effectiveness of the alpha-beta pruning gets increased? 1
(a) Depends on the nodes

viii Which value is assigned to alpha and beta in the alpha-beta pruning? 1
(d) Both Alpha = max & Beta = min

ix. Which of the following is an advantage of using an expert system development tool? 1
(d) All of these

x. What will take place as the agent observes its interactions with the world? 1
(a) Learning

Q.2 i. Is intelligence a single thing so that one can ask a yes or no question ``Is this machine intelligent or not? 3
Ans. No. Intelligence involves mechanisms, and AI research has discovered how to make computers carry out some of them and not others. If doing a task requires only mechanisms that are well understood today, computer programs can give very impressive performances on these tasks. Such programs should be considered ``somewhat intelligent".
Student can also write their views related with AI and Machine Learning

ii. Artificial Intelligence 2 marks 7
Minimum two definition of AI 3 marks
Application of AI. 2 marks

OR iii. LISP 2 marks 7
Global variable in LISP 2 marks
Program to calculate area of circle 3 marks

Q.3 i. Depth First Search Algorithm. 4
Explanation 2 marks
Algorithm 2 marks

ii. Write algorithm of Problem Reduction (AND-OR Graph) with diagram. 6
Explanation 2 marks
Algorithm 2 marks
Diagram 2 marks

OR iii. Trace the constraint satisfaction procedure for solving the following cryptarithmetic problem. 6

CROSS.
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Procedure 3 marks
Apply in Equation with exact constraint 3 marks

Q.4 i. Convert the following sentence to predicate logic(Any five)- 5
1 mark Each (1 mark * 5)

ii. Characteristics of a knowledge representation system 3 marks 5
Common schemes of knowledge representation. 2 marks

iii. Give semantic network representation for the following facts- 5
1 mark Each (1 mark * 5)

Q.5 i. At least 4 components that are needed for representing a plan 4
1 mark Each (1 mark * 4)

ii. Alpha -beta cut-offs algorithm 4 marks 6
Example. 2 marks

OR iii. Game playing strategies 3 marks 6
Major components of a game playing program. 3 marks

Q.6 Attempt any two:

i. Give structure of an expert system, explain its component 5
Explanation 5 Marks

ii. Major application areas of an expert system 3 marks 5
Their various applications. 2 marks

iii. Types of expert systems 3 marks 5
Any one of expert systems 2 marks

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