

**EXAMINATION PAPER**

**FACULTY:COMPUTER SCIENCE & MULTIMEDIA**

**COURSE: MASTER OF COMPUTER SCIENCE**

**YEAR/SEMESTER: FIRST / SECOND**

**MODULE TITLE & CODE: ARTIFICIAL INTELLIGENCE : AFI 124**

**DATE:**

**TIME ALLOWED: 3 HOURS  START: 1:00 PM FINISH: 4:00 PM**

**Instruction to candidates**

1. This question paper has THREE (3) Sections.
2. Answer all **7** questions in Section A, VSAQ
3. Answer **7** questions out of 9 in Section B, SAQ.
4. Answer **2** questions out of 3 in Section C, LAQ.
5. No scripts or answer sheets are to be taken out of the Examination Hall.
6. Lengthy answers do not win more marks. Students are advised to write clear and concise answer with valid relevant examples

***Do not open this question paper until instructed***

*(Candidates are required to give their answers in their own words as far as practicable)*

**SECTION A**

**Very Short Answer Questions**

**Attempt all seven (7) questions [2 × 7 = 14]**

1. What is intelligence?
2. Define knowledge-based agent. Why is it useful?
3. What is computer vision in AI?
4. Define what it means for a search algorithm to be complete, and to be optimal.
5. Differentiate between inference and reasoning.
6. Define supervised learning.
7. What is Bayes’ theorem?

**SECTION B**

**Short Answer Questions**

**Attempt only seven (7) questions out of nine (9) questions [7 × 8 = 56]**

Q. 1   Short Answer Question (Chapter 1 Introduction to Artificial Intelligence)

* List out different perspectives of AI. Describe how Turing Test is used to define AI as acting humanly?

Q. 2   Short Answer Question (Chapter 2 Intelligent Agents)

* What is environment? Describe properties of environment with example. How plausible is human-like artificial intelligence?

Q. 3   Short Answer Question (Chapter 3 Problem Solving and Searching)

* Justify that searching is one of the important part of AI. Explain in detail about any two types of blind search with practical examples.

Q. 4   Short Answer Question (Chapter 3 Problem Solving and Searching)

* Explain Alpha-beta cut off in Min-Max algorithm with the help of an example.

Q. 5   Short Answer Question (Chapter 4 Knowledge Representation)

* “All students should appear in the examination. Only those students who score 80% and above will get distinction. To get distinction, the students should be regular in the class, submit home works in time and be sincere. The students with distinction will get good recommendation from the professors Some of the professors do not like to recommend students scoring less than 75%.”

Represent the above sentences in first-order logic and explain each step.

Q. 6   Short Answer Question (Chapter 4 Knowledge Representation)

* Why normal forms are required in AI? How do you convert to conjunctive normal form? Explain all the steps with examples.

Q.7 Short Answer Question (Chapter 5 Machine Learning)

* What is Hebbian learning? Explain the learning process with an example.

Q. 8   Short Answer Question (Chapter 5 Machine Learning)

* What is learning by simulating evolution? Explain appropriate algorithm based on this learning process with an example.

Q. 9   Short Answer Question (Chapter 6 Applications of Artificial Intelligence)

* Explain different steps involved in the Natural Language Processing (NLP) with block diagram and examples.

**Group C**

**Long Analytical or Case Question**

**Attempt any two (2) questions out of three (3) questions [2 × 15 = 30]**

Q. 1 Long or Analytical Answer Question (Chapter 3 Problem Solving and Searching)

* What do you mean by heuristic search? Given the state representation, illustrate how greedy best first and A\* search is used to find the goal state. Discuss on the results obtained using both the algorithms.

















S is the start state and G is the goal state. The heuristics of the states are:

h(S) =12, h(A) = 8, h(D) = 9, h(B) = 7, h(E) = 4, h(C) = 5, h(F) = 2, h(G) = 0.

Q. 2 Long or Analytical Answer Question (Chapter 5 Knowledge Representation)

* What is predicate logic? How it is different from propositional logic? How resolution algorithm is used as a rule of inference in predicate logic? Convert the following sentences into FOPL:
  + All over smart persons are stupid.
  + Children of all stupid persons are naughty.
  + Harry is child of Charles.
  + Charles is over smart.

Prove that “Harry is naughty” using resolution algorithm.

**Q. 3** Long or Analytical Answer Question (Chapter 6 Applications of Artificial Intelligence)

* How can the application of AI revolutionize our lives? Explain with few recent developments in the field of Artificial Intelligence.

Good Luck