Question Paper Code : 90424

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Sixth/Seventh/Eighth Semester

Computer Science and Engineering

CS 8691 — ARTIFICIAL INTELLIGENCE

(Common to : Mechatronics Engineering)

(Regulations 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define rational agent.

2. Differentiate learning element and performance element of a general learning agent.

3. List the ways to formulate constraint satisfaction problem.

4. State why problem formulation must follow goal formulation.

5. Differentiate forward chaining and backward chaining.

6. Why does knowledge require a different representation model than the data?

7. List the characteristics of multi-agent systems.

8. What are the components of communicating agent?

9. List the objectives of NLP in AI.

10. State the difficulties in speech recognition.

PART B — (5 × 13 = 65 marks)

11. (a) (i) List the various properties of task environments. (4)

        (ii) Give the PEAS description of the following agent types and characterize its properties :

            (1) Knitting a sweater (3)

            (2) Shopping for the used books in the internet (3)

            (3) Part-picking robot. (3)

                                Or

    (b) Explain model-based reflex agents and utility-based reflex agents in detail. (13)

12. (a) (i) Mention the criteria for evaluation of search strategy. (4)

(ii) Explain Alpha-Beta pruning search in detail. (9)

Or

(b) (i) Differentiate Depth First Search and Breadth First Search algorithm in AI. (8)

(ii) Write a simple back tracking algorithm for constraint satisfaction problems. (5)

13. (a) Elucidate in detail the different approaches to represent the knowledge in a Knowledge based agent. (13)

Or

(b) Express the following in first order logic:

(i) Everyone who walks is fit. (2)

(ii) No one who studies fails. (3)

(iii) Some numbers are not real. (2)

(iv) All boys in the class are brilliant than Akil whereas Akil is brilliant than some girls in the class. (4)

(v) All babies are intelligent. (2)

14. (a) With suitable example, explain trust and reputation in multi-agent systems in detail (13)

Or

(b) Give a brief analysis of how planning and acting happens in real world. Explain through an example. (13)

15. (a) (i) Explain any two applications of AI in the field of medicine. (8)

(ii) Write about robotic perception in detail. (5)

Or

(b) (i) Consider the problem faced by an infant learning to speak and understand a language. Explain how this process fits into the general learning model. (7)

(ii) Describe the components of leaning process of the infant. (6)

PART C — (1 × 15 = 15 marks)

16. (a) For the below given search graph, answer the following:

Here S is the start node and G is the goal node.

    (i)   What is the path found by the Breadth First Search algorithm?   (4)

    (ii)   List the order in which the Depth First Search algorithm inspects the nodes.   (4)

    (iii) What is the path found by Depth First Search algorithm?   (4)

    (iv) What is the path found by DFID algorithm?   (3)
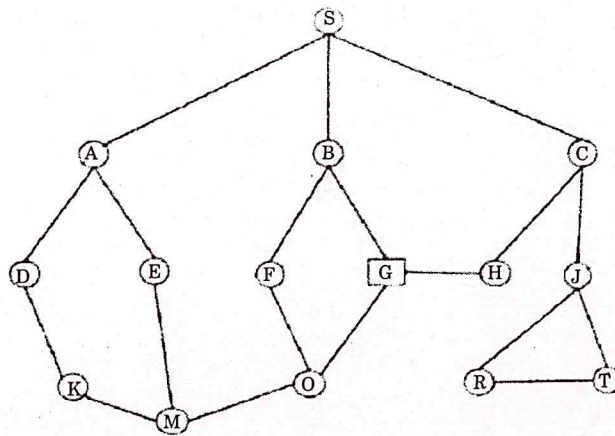
Or

(b) (i) Write a simple agent function for vacuum cleaner agent.   (8)

    (ii)   Give one domain in which AI agent would be more promising.   (7)