Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 70393

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fifth/Sixth Semester

Electronics and Instrumentation Engineering

CS 6659 – ARTIFICIAL INTELLIGENCE

(Common to Instrumentation and Control Engineering / Computer Science and Engineering / Information Technology)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define production system. Mention the productions for water jug problem.
2. Mention the advantages of depth first search.
3. Define iterative deepening search.
4. Define tautology.
5. What are fuzzy sets?
6. List the properties of fuzzy sets.
7. Differentiate supervised learning and unsupervised learning.
8. List the purpose of STRIPS language.
9. List out the problem areas addressed by expert systems.
10. What are the advantages of the MYCIN?

PART B — (5 × 13 = 65 marks)

11. (a) Explain in detail about
    (i) Simple reflex agent
    (ii) Model based agent
    (iii) Utility based agent
    (iv) Goal based agent

Or

(b) Explain in detail about the following:

(i) Greedy best-first search. (5)

(ii) A * search (4)

(iii) Memory bounded heuristic search. (4)

12. (a) Explain resolution in predicate logic with suitable example. (13)

Or

(b) Consider the following sentences :

- John like all kinds of food
- Apples are food
- Chicken is food
- Anything any one eats and isn't killed by is food
- Bill eats peanuts and is still alive
- Sue eats everything Bill eats.

(i) Translate these sentences into formulae in predicate logic. (8)

(ii) Convert the above FOL into clause form. (5)

13. (a) What is Backward Chaining and how does it work? Explain the backward chaining algorithm. What are the advantages and disadvantages of backward chaining?

Or

(b) Explain the basic structure of a fuzzy inference system. Explain each component of it in detail.

14. (a) Explain in detail about STRIPS and write the components of STRIPS for the given scenario: 'Consider a flight journey in a luxurious flight from India to US'. (13)

Or

(b) (i) Express your views about Rote Learning. (7)

(ii) How would you express Formal learning theory? (6)

15. (a) Define Expert System. Explain the architecture of an expert system in detail with a neat diagram and an example. (13)

Or

(b) Explain the need, significance and evolution of XCON expert system. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Consider the problem of changing a flat tire. The goal is to have a good spare tire properly mounted onto the car's axle, where the initial state has a flat tire on the axle and a good spare tire in the trunk. To keep it simple, our version of the problem is an abstract one, with no sticky lug nuts or other complications. There are just four actions: removing the spare from the trunk, removing the flat tire from the axle putting the spare on the axle and leaving the car unattended overnight. Write the STRIPS and find out the solution.

Or

(b) Construct a Bayesian network and define the necessary CPTs for the given scenario We have a bag of three biased coins a, b, and c with probabilities of coming up heads of 20%, 60%, and 80%, respectively. One coin is drawn randomly from the bag (with equal likelihood of drawing each of the three coins) and then the coin is flipped three times to generate the outcomes X1, X2 and X3.

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