B. Tech. 6th Semester END Term Examination-2021
Subject: ARTIFICIAL INTELLIGENCE
(Paper Code: UCS06C22/ UCS06C01 )

Time: 2 hours | Maximum Marks: 50

This exam contains 3 pages (including this page) and 22 problems.

**[Section A]**

*This section comprises of questions to deal with the theoretical knowledge of the subject.*

1. With finite search elements in a problem solving situation, among the given options, which search algorithm requires less memory?
   a) Optimal Search b) Depth First Search c) Breadth-First Search d)Linear Search [2 marks]

2. Identify the appropriate situation for that an uninformed search is most suitable to use.
   a) Complex Game b)Limited Search Space c)Large Search Space d) All the options [2 marks]

3. There are some fundamental properties that how should knowledge be represented to be used for an Ai Technique. Find among the options which one is not correct?
   a) When two individual situations are represented, knowledge should provide generalization such that only common properties of both situations are represented rather than representing both situations individually.
   b) Knowledge should be represented such that it should be understood by the people who have provided it.
   c) Knowledge should be represented with large variability and voluminous facts.
   d) Knowledge should be represented in a way that it can be easily modified. [2 marks]

4. What are the basic entities in knowledge representation?
   a) Facts and Symbols b) Logic and Inference c) Proposition and Predicate d) None of the options [2 marks]

5. Select the most appropriate option that defines the certainty factor accurately?

   a)The Certainty Factor (CF) is a numeric value that tells us about how likely an event or a statement is supposed to be true.
   b)The certainty factor is same as the probability of any event.
   c)The Certainty Factor (CF) is a numeric value that tells us about how certain we are about performing a particular task.
   d)The Certainty Factor (CF) is a Measure of Belief(MB) to accomplish an action.

   [2 marks]

6. Consider the following statement: "The value of the Certainty factor lies between -1.0 to +1.0, where the negative 1.0 value suggests that the statement can never be true in any situation, and the positive 1.0 value defines that the statement can never be false."
   What does the value 0 denote for CF?
   a) Half true Half False
   b) Somewhat true but not entirely false

c) Agent has no information about the event
d) Both a. and b. [2 marks]

7. Which of the following classifications of the environment are not valid?
a) Deterministic vs non- Deterministic.
b) Observable and partially-observable.
c) Discrete and episodic.
d) Static and dynamic. [2 marks]

8. The classification of the environment is independent of the type of AI model being used is a false statement?
a) True
b) False [2 marks]

9. Which of the following statements correctly define the concept of Inference in AI?
a) It is the way in which facts and information are stored in the storage system of the agent.
b) When it is concluded from the facts and figures to reach a particular decision, that is called inference.
c) Knowledge is modified and converted into the format which is acceptable by the machine.
d) All of the options. [2 marks]

10. Programming a robot by physically moving it through the trajectory you want it to follow is called.
a) Contact sensing control b) Continuous-path control c) Robot vision control d) Pick-and-place control e) None of the above [2 marks]

11. The most appropriate description of week AI is-
a) The embodiment of human intellectual capabilities within a computer.
b) A set of computer programs that produce output that would be considered to reflect intelligence if it were generated by humans.
c) The study of mental faculties through the use of mental models implemented on a computer.
d) All of the above.
e) None of the above. [2 marks]

12. Logical ambiguity may be caused by
a) syntactic similarity b) multiple word meanings c) unclear antecedents d) All of the above
e) None of the above [2 marks]

13. Which search is equal to minimax search but eliminates the branches that can not influence the final decision? a) Alpha-beta pruning b) Branch-and-bound c) Depth-limit search d) Constraint reduction search [2 marks]

14. Wumpus World is a classic problem in AI, and best example of
a) Single player Game
b) Two player Game
c) Reasoning with Knowledge
d) Knowledge based Game
e) The correct option is not mentioned here. [2 marks]

15. Inference algorithm is complete only if
    a) It can derive any sentence
    b) It can derive any sentence that is an entailed version
    c) It is truth preserving
    d) It can derive any sentence that is an entailed version and It is truth preserving [2 marks]

16. Fuzzy logic different from conventional control method in the following approach.
    a) FOR Approach b) WHILE Approach c) DO Approach d) IF and THEN Approach [2 marks]

17. How best the Decision theory is explained?
    a) Decision Theory = Uncertainty + utility theory
    b) Decision Theory = Probability theory + utility theory
    c) Decision Theory = Inference theory + utility theory
    d) Decision Theory = Probability theory + preference [2 marks]

18. Which operation modifies the meaning of a fuzzy set, which can be understood as terms that modify the shapes of fuzzy sets by using adverbs such as very, quite, more, less and slightly.
    a) Unification b) Fuzzy Integration c) Linguistic Hedges d) Fuzzy membership function [2 marks]

19. What is perceptron?
    a) single layer feed-forward neural network with pre-processing
    b) an auto-associative neural network
    c) a double layer auto-associative neural network
    d) a neural network that contains feedback [2 marks]

20. What is a heuristic function?
    a) A function to solve mathematical problems
    b) A function which takes parameters of type string and returns an integer value
    c) A function whose return type is nothing
    d) A function that maps from problem state descriptions to measures of desirability [2 marks]

**[Section C]**

*This section comprises of short answer type questions, including all chapters of syllabus, AI General knowledge and AI current affairs and logical thinking.*

21. Complete the statements with your answer. [Each question carry equal marks =1] [5 marks]

    A. An AI technique that allows computers to understand associations and relationships between objects and events is called_____.
    B. Uncertainty arises in the wumpus world because the agent's sensors give only _____ Information.
    C. General algorithm applied on a game tree for making decision of win/lose is better known as _____ Algorithms.
    D. Forward state-space search also known as _____ planning.
    E. The values of the fuzzy set membership is represented by _____ of TRUTH.

22. Suppose, probability of getting infected with chicken pox in a locality is 1/18000 and Herpes is 0.025. Also given the probability of a patient having rash, when he is infected with chicken pox , is 0.32. If the probability of a patient having rash is 0.64, determine the probability of a patient being infected with chicken pox when he has rash on his skin? [5 marks]