Roll No. .....

E–575

M. Sc. (IT) (Second Semester) (Main/ATKT)

EXAMINATION, May-June, 2021

Paper Fifth

AI AND EXPERT SYSTEM

(205)

Time : Three Hours] [*Maximum Marks : 100*

[*Minimum Pass Marks : 40*

Note : Attempt all Sections as directed.

Section—A 1 each

(Objective/Multiple Choice Questions)

Note : Attempt all questions.

Choose the correct answer and write it in your answer book :

1. Aritficial Intelligence is about .....
   (a) Playing a game on computer
   (b) Making a machine intelligent
   (c) Programming on machine with your own intelligence
   (d) Putting your intelligence in machine

2. The application/application of Artificial Intelligence is/are :
   (a) Expert system
   (b) Gaming
   (c) Vision system
   (d) All of the above

3. Which of the given language is not commonly used for AI ?
   (a) LISP
   (b) PROLOG
   (c) Python
   (d) Perl

4. A technique that was developed to determine whether a machine could or could not demoenstrate the artificial intelligence known as the .....
   (a) Boolean Algebra
   (b) Turning Test
   (c) Logarithm
   (d) Algorithm

5. The component of an Expert System is .....
   (a) Knowledge base
   (b) Inference engine
   (c) User Interface
   (d) All of the above

6. The available ways to solve a problem of state-space search :
   (a) 1
   (b) 2
   (c) 3
   (d) 4

7. Among the given options, which is not the required property of knowledge representation ?
   (a) Inferential efficiency
   (b) Representational verification
   (c) Inferential adequacy
   (d) Representational adequacy

8. Which agent deals with the happy and unhappy state ?
   (a) Utility-based agent
   (b) Goal-based agent
   (c) Model-based agent
   (d) Learning agent

9. Which AI technique enables the computers to understand the associations and relationships between object and events ?
   (a) Heuristic processing
   (b) Relative symbolism
   (c) Cognitive science
   (d) Pattern matching

10. Web Grawler is an example of .....
    (a) Intelligent agent
    (b) Problem solving agent
    (c) Simple reflex agent
    (d) Model based agent

11. Ways to achieve AI in real life are .....
    (a) Machine learning
    (b) Deep learning
    (c) Both (a) and (b)
    (d) None of the above

12. Which statement is valid for the Heuristic function ?
    (a) The heuristic function is used to solve mathematical problems.
    (b) The heuristic function takes parameters of type string and returns an integer value.
    (c) The heuristic function does not have any return type.
    (d) The heuristic function calculates the cost of an optimal path between the pair of states.

13. The decision tree algorithm reaches its destination using .....
    (a) Single test
    (b) Two test
    (c) Sequence of test
    (d) No test

14. Who is the father of Artificial Intelligence ?
    (a) Doug Catting
    (b) John McCarthy
    (c) Williams
    (d) Rasmus Lerdorf

15. The traditional way to exit and LISP system is to enter .....
    (a) quit
    (b) exit
    (c) bye
    (d) ok

16. Select the most appropriate situation for that a blind search can be used :
    (a) Real-life situation
    (b) Small search space
    (c) Complex game
    (d) All of the above

17. If a robot is able to change its own trajectory as per the external conditions, then the robot is considered as the .....
    (a) Mobile
    (b) Non-servo
    (c) Open loop
    (d) Intelligent

18. The search algorithm which is similar to the minimax search, but removes the branches that don't affect the final output is known as .....
    (a) Depth-First search
    (b) Breath-First search
    (c) Alpha-beta pruning
    (d) None of the above

19. In the TSP problem of *n* cities the time taken for traversing all cities, without having prior knowledge of the length of the minimum tour will be .....
    (a) O (*n*)
    (b) O (n^2)
    (c) O (*n* !)
    (d) O (*n*/2)

20. A knowledge-based agent can be defined with ..... levels.
    (a) 2
    (b) 3
    (c) 4
    (d) None of the above

Section—B 2 each

(Very Short Answer Type Questions)

Note : Attempt all questions. Answer using 2-3 sentences.

1. What is AI technique ?
2. What is an Agent ?
3. Define state space search.
4. What is Graph ?
5. What is knowledge representation ?
6. What is frame systems ?

7. What is conditional planning ?
8. What is conditional probability ?
9. What is meant by Learning ?
10. What is Expert Systems ?

Section—C 3 each

(Short Answer Type Questions)

Note : Attempt all questions. Answer precisely using 75 words.

1. Explain the various types of agent program.
2. Explain the concept of Rationality.
3. List the various search strategies and explain or define any *one* strategy.
4. What is Heuristic search techniques ?
5. Explain first order predicate logic.
6. What is conceptual dependency ?
7. What is partial-order planning ? Explain the advantages and disadvantages of partial-order planning.
8. What is Inference mechanism ? Explain the forward and backword chaining.
9. Explain application of expert systems.
10. What is meant by learning ? Explain knowledge acquisition and skill refinement.

Section—D 6 each

(Long Answer Type Questions)

Note : Attempt all questions. Answer precisely using 150 words.

1. How is machine learning related to AI ? Explain the different domains of Artificial Intelligence (AI).

   Or

   Explain any *two* of the following :

   (a) Defining problems as state space search

   (b) Production systems and their characteristics

   (c) Agents and Environments

2. Explain the advantages and disadvantages of depth-first and breath-first search with the algorithm.

   Or

   Discuss any *two* of the following :

   (a) Minimax search procedure

   (b) Alpha-beta cutoffs

   (c) AO* algorithm

3. What is Semantic Network ? Explain frame systems and value inheritance with examples.

   Or

   What is frame representations ? Explain syntax and numeric function in LISP.

4. Explain any *two* of the following :

   (a) Parsing techniques

   (b) Recursive transition nets

   (c) Context free grammar

   Or

   Explain Bayesian and Augmented Transition Nets (ATN).

5. Explain expert system characteristics and the various stages of expert system development.

   Or

   Explain the role of learning, induction learning and explanation based learning.