Department of Artificial Intelligence and Data Science

Introduction to Artificial Intelligence and Data Science

Mid I Examinations April 2023

Objective Bit Bank

UNIT I

1. Who is the inventor of Artificial intelligence? [ ]
   a) Geoffrey Hinton b) Andrew Ng c) Alan Turing d) John McCarthy
2. What is the full form of "AI"? [ ]
   a) Artificially Intelligent b) Artificial Intelligence
   c) Artificially Intelligent d) A Advanced Intelligence
3. Which of the following is not an application of artificial intelligence? [ ]
   a) Face recognition system b) Chatbots c) LIDAR d) DBMS
4. Which of the following is not a branch of Artificial Intelligence? [ ]
   a) Cyber forensics b) NLP c) Deep Learning d) Machine Learning
5. Which of the following is not a type of Artificial Intelligence agent? [ ]
   a) Learning AI b) Goal-based AI c) Simple reflex AI d) Unity-based AI
6. Which of the following is not the commonly used programming language for Artificial Intelligence? [ ]
   a) Perl b) Java c) PROLOG d) LISP
7. Face Recognition system is based on which type of approach? [ ]
   a) Weak AI b) Applied AI c) Cognitive AI d) Strong AI
8. Which of the following can improve the performance of an AI agent? [ ]
   a) Perceiving b) Learning c) Observing d) All of the mentioned
9. Which of the following is/are the composition for AI agents? [ ]
   a) Program only b) Architecture only c) both a and b d) None of the mentioned
10. Which of the following is not a type of Artificial Intelligence agent? [ ]
    a) Learning AI b) Goal-based AI c) Simple reflex AI d) Unity-based AI
11. Which of the following machines requires input from the humans but can interpret the outputs themselves? [ ]
    a) Actuators b) Sensor c) Agents d) AI system
12. _____ number of informed search methods are there in Artificial Intelligence. [ ]
    a) 4 b) 3 c) 2 d) 1
13. Face Recognition system is based on which type of approach? [ ]
    a) Weak AI approach b) Applied AI approach c) Cognitive AI approach d) Strong AI approach
14. Which of the following environments is strategic? [ ]
    a) Rational b) Deterministic c) Partial d) Stochastic

15. Which of the following is an expansion of Artificial Intelligence application? [ ]
a) Game Playing b) Planning and Scheduling c) Diagnosis d) All of the mentioned
16. On which of the following approach A basic line following robot is based? [ ]
a) Applied approach b) Weak approach c) Strong approach d) Cognitive approach
17. A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the___ [ ]
a) Boolean Algebra b) Turing Test c) Logarithm d) Algorithm
18. Agents behavior can be best described by _____ [ ]
a) Perception sequence b) Agent function c) Sensors and Actuators d) Environment in which agent is performing
19. 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
20. The Task Environment of an agent consists of _____ [ ]
a) Sensors b) Actuators c) Performance Measures d) All of the mentioned
21. The game of Poker is a single agent. [ ]
a) True b) False
22. Satellite Image Analysis System is (Choose the one that is not applicable). [ ]
a) Episodic b) Semi-Static c) Single agent d) Partially Observable
23. What is the rule of simple reflex agent? [ ]
a) Simple-action rule b) Condition-action rule c) Simple & Condition-action rule
d) None of the mentioned
24. What are the composition for agents in artificial intelligence? [ ]
a) Program b) Architecture c) Both Program & Architecture d) None of the mentioned
25. In which agent does the problem generator is present? [ ]
a) Learning agent b) Observing agent c) Reflex agent d) None of the mentioned
26. Which agent deals with happy and unhappy states? [ ]
a) Simple reflex agent b) Model based agent c) Learning agent d) Utility based agent
27. Which action sequences are used to achieve the agent's goal? [ ]
a) Search b) Plan c) Retrieve d) Both Search & Plan
28. Which elements in the agent are used for selecting external actions? [ ]
a) Perceive b) Performance c) Learning d) Actuator
29. What is meant by an agent's percept sequence? [ ]
a) Used to perceive the environment b) Complete history of actuator
c) Complete history of perceived things d) None of the mentioned

UNIT II

1. Goal formulation, based on the current situation and the agent's performance measure, is the first step in problem solving. [ ]
   a) Goal formulation b) Problem formulation c) Path d) Both a and b
2. Problem formulation is the process of deciding what actions and states to consider, given a goal .[ ]
   a) Goal formulation b) Problem formulation c) Path d) Both a and b
3. A search algorithm takes____ as input and returns ____ as an output? [ ]
   a) input,output b) problem, solution c) solution, problem d) input and problem
4. Which of the following is not an example of toy problem? [ ]
   a) Two state vacuum cleaner b) 8-puzzle game c) Traveling salesman problem d) None
5. A tree representation of search space is called ____ [ ]
   a) space tree b) search tree c) state space d) random forest
6. uniform-cost search expands the node n with the _____ [ ]
   a) Lowest path cost b) Heuristic cost c) Highest path cost d) Average path cost
7. Which search method takes less memory? [ ]
   a) Depth-First Search b) Breadth-First Search c) Linear Search d) Optimal Search
8. What is the best way to go for game playing problem? [ ]
   a) Linear approach b) Random approach c) Heuristic approach d) Optimal approach
9. A problem in search space is defined by which of the following states? [ ]
   a) Intermediate state b) Initial state c) Laste state d) All of the mentioned states
10. The set of actions for a problem in state space is formulated by which one of the following? [ ]
    a) Successor function b) Initial state c) Intermediate state d) None of these
11. Which of the following is the process of eliminating the detail from a given state? [ ]
    a) Extraction b) Data mining c) Information retrieval d) Abstraction
12. What kind of agent is Web-Crawler? [ ]
    a) Model based b) Problem solving c) Simple reflex d) Intelligent goal based
13. Which of the following is the main component for measuring the performance of problem solving techniques? [ ]
    a) Completeness b) Optimality c) TIme and space complexity d) All of these
14. A* algorithm is based on _____ [ ]
    a) Breadth First Search b) Depth FIrst Search c) Best FIrst Search d) Hill Climbing
15. Which of the following data structure is used by the Breadth First Search algorithm? [ ]
    a) Stacks b) Queues c) Heap d) Random Forest
16. Which of the following data structure is used by the Depth First Search algorithm? [ ]
    a) Stacks b) Queues c) Heap d) Random Forest
17. Which of the following formula Best First algorithm works? [ ]
    a) f(n) = h(n) b) f(n) = g(n) + h(n) c) a) f(n) = g(n)* h(n) d) a) f(n) = g(n)/h(n)
18. Which of the following formula A* algorithm works? [ ]
    a) f(n) = h(n) b) f(n) = g(n) + h(n) c) a) f(n) = g(n)* h(n) d) a) f(n) = g(n)/h(n)
19. Which of the following is/are informed search algorithms? [ ]

a) Best First Search algorithm b) A* algorithm c) Both a and b d) BFS and DFS

20. Heuristic method emphasizes learning by [ ]
    a) Doing and discovery b) understanding c) Gestures d) Feeling
21. Armstrong was the main exponent of ____ [ ]
    a) problem solving method b) Demonstration method c) Heuristic method d) Project method
22. If a farmer estimates the yield of a particular crop, he uses considerable skills in estimation, approximation and optimization, then which method will be used? [ ]
    a) project method b) heuristic method c) Lecture method d) field method
23. The limitation of heuristic method is___ [ ]
    a) child centeredness b) Develops self learning c) uneconomical in terms of time d) inculcate scientific attitude. [ ]
24. Which of the following is called a heuristic method? [ ]
    a) search method b) project method c) Troubleshooting method d) Lecture method
25. Which search is implemented with an empty first-in-first-out queue? [ ]
    a) Depth-first search b) Breadth-first search c) Bidirectional search d) None of these
26. Which of the following artificial intelligence algorithms enforces a fixed depth limit on nodes? [ ]
    a) Bidirectional search b) Depth-first search c) Iterative deepening search
    d) Depth-limited search
27. Which search implements stack operation for searching the states? [ ]
    a) Depth-limited search b) Depth-first search c) Breadth-first search d) None of these
28. DFS is _____ efficient and BFS is _____ efficient. [ ]
    a) Space, Time b) Time, Space c) Time, Time d) Space, Space
29. The available ways to solve a problem of state-space-search. [ ]
    a) 1 b)2 c) 3 d) 4
30. 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) Breadth-first search c) Alpha-beta pruning d)None of the above

UNIT III

1. Which of the following is not a property of representation of knowledge? [ ]
   a) Representational Verification b) Representational Adequacy
   c) Inferential Adequacy d) Inferential Efficiency
2. A knowledge-based agent can join general knowledge with current thoughts to extract hidden aspects of the recent state prior to selecting actions. [ ]
   a) True b) False c) Partially true d) Partially Negative
3. _____ is not familiar connectives in First - Order Logic [ ]
   a) iff b) or c) not d) and
4. Wumpus World is a classic problem, and it is a good example of which one of the following? [ ]
   a) Single-player Game b) Two-player Game
   c) Reasoning with Knowledge d) Knowledge-based Game
5. Knowledge and reasoning also play a crucial role in dealing with _____ environment. [ ]
   a) Completely Observable b) Neither Completely nor Partially Observable
   c) Partially Observable d) Only Completely and Partially Observable
6. A knowledge-based agent can combine general knowledge with current percepts to infer hidden aspects of the current state prior to selecting actions. [ ]
   a) True b) False
7. Which of the following cannot be represented using propositional logic? [ ]
   a) 2+2 = 4 b) 2*2=22 c) Sun rises in the west d) Some boys are clever
8. How many proposition symbols are there in artificial intelligence? [ ]
   a) 1 b) 2 c) 3 d) 4
9. Translate the following statement into FOL. [ ]
   “For every a, if a is a philosopher, then a is a scholar”
   a) ∀ a philosopher(a) scholar(a) b) ∃ a philosopher(a) scholar(a)
   c) All of the mentioned d) None of the mentioned
10. Which is created by using single propositional symbol? [ ]
    a) Complex sentences b) Atomic sentences c) Composition sentences d) None of these
11. First Order Logic is also known as _____ [ ]
    a) First Order Predicate Calculus b) Quantification Theory
    c) Lower Order Calculus d) All of the mentioned
12. If x is variable then ∀x is read as [ ]
    a) for all x b) for each x c) for every x d) All the mentioned are true
13. If x is a variable, then ∃x is read as [ ]
    a) for all x b) for each x c) for some x d) none of the mentioned
14. Consider ∀x ∃(y)[P (x, y, z)]. Which variable is free ? [ ]

a) x b) y c) z d) both x,u

15. Which of the following is a way to represent actions that occur in the world. [ ]
a) Events b) Objects c) Meta Knowledge d) Facts

Question Bank

UNIT I/CO 1

1. a) What is artificial intelligence? In detail explain the four definitions of Artificial Intelligence? [L2] [6M]
   b) Briefly explain different types of Artificial Intelligence? [L2] [6M]

2. What is artificial intelligence? What are the foundations of artificial intelligence? [L2] [12M]

3. What is artificial intelligence? Explain the history of artificial intelligence? [L2] [12M]

4. a) How Artificial Intelligence changes today' world? In detail explain about the state of art in artificial intelligence? [L3] [6M]
   b) What is artificial intelligence? What are the applications of artificial Intelligence? [L3] [6M]

5. a) What is an agent? How does an agent perceive the environment and perform Actions? [L3] [6M]
   b) What is PEAS? What is the role of PEAS in agents? [L2] [6M]

6. What is an agent? List out various types of agents in artificial intelligence? Explain any two agents in detail? [L2] [12M]

7. How is a goal based agent different from a utility based agent? Explain with suitable diagrams? [L3] [12M]

8. a) Write an agent program for a simple reflex agent? [L4] [6M]
   b) Write an agent program for model based agent? [L4] [6M]

9. a) How are learning agents different from other agents? Explain with a suitable diagram? [L3] [6M]
   b) What are the properties of a task environment? [L2] [6M]

UNIT II/CO 2

1. In detail explain about problem solving agents and phases in the problem solving process? [L2] [12M]

2. a) What is the role of goal formulation and problem formulation in problem solving agents? [L2] [6M]
   b) List out some examples of toy and real world problems? How are toy problems different from real world problems? [L3] [6M]

3. What is the search problem? Elaborate the term state space, initial state, goal state , actions, transition mode and action cost function? [L3] [12M]

4. Define a 2 stage vacuum cleaner problem? Draw the state space diagram for a 2-stage vacuum cleaner? [L3] [12M]

5. a) How are informed search algorithms different from uninformed search algorithms? [L3] [6M]
   b) What is a heuristic search function? How Best First Search algorithm is different from A* algorithm? [L3][6M]

6. How heuristic values are used by A* algorithm? Explain with an example? [L3] [12M]

7. a) What is depth first search? Explain about different versions of depth first Search? [L2] [6M]
   b) What is breadth first search? How breadth first search is different from depth first search? [L2] [6M]

8. What is A* algorithm? How A* algorithm is useful in solving the 8-puzzle instance problem? [L3] [12M]

9. What are the drawbacks of depth first search algorithm? How will the search process be carried out using a depth limited search algorithm? [L3] [12M]

10. a) List out various uniform search algorithms and compare their complexities? [L3] [6M]
    b) Explain about bidirectional search and mention its advantages and disadvantages? [L2] [6M]

UNIT III/CO 3

1. What do you mean by knowledge representation and knowledge representation and reasoning AI? What parameters will you consider when representing knowledge? [L2] [6M]

2. Differentiate between knowledge and intelligence? How to represent knowledge in systems? [L3] [6M]

3. In detail explain about different types of knowledge? [L2] [6M]

4. With a neat diagram explain the knowledge cycle in AI? [L3] [6M]

5. With suitable examples explain the syntax and semantics of propositional logic? [L3] [6M]

6. How propositional logic is used to represent knowledge? Explain about atomic and compound propositions? [L3] [6M]

7. How is predicate calculus different from propositional logic? With suitable examples explain about the “for all” quantifier? [L3] [6M]

8. How is predicate calculus different from propositional logic? With suitable examples explain about the “there exist” quantifier? [L3] [6M]

9. Convert the following statements to first order logic [L4] [6M]
   i) All men are clever
   ii) All students like either Machine learning or Web Technologies
   iii) There are some students who likes deep learning
   iv) No rectangle is a square.

10. How compound propositions are formed using atomic propositions. List out various connectives used in compound propositions. [L2] [6M]