Set of 50 Objective Type questions with solutions

1. Which instruments are used for perceiving and acting upon the environment?

a) Sensors and Actuators

b) Sensors

c) Perceiver

d) None of the mentioned

Explanation :An agent is anything that can be viewed as perceiving and acting upon the environment through the sensors and actuators.

2. What is the rule of simple reflex agent?

a) Simple-action rule

b) Condition-action rule

c) Both a & b

d) None of the mentioned

Answer : b

Explanation : Simple reflex agent is based on the present condition and so it is condition action rule.

3. What are the composition for agents in artificial intelligence?

a) Program

b) Architecture

c) Both a & b

d) None of the mentioned

Answer : c

Explanation : An agent program will implement function mapping percepts to actions.

4. Optimality of BFS is

a) When there is less number of nodes

b) When all step costs are equal

c) When all step costs are unequal

d) Both a & c

Answer: b

Explanation: It always expands the shallowest unexpanded node.

5. A* is optimal if h(n) is an admissible heuristic-that is, provided that h(n) never underestimates the cost to reach the goal.

a) True

b) False

Answer: a

Explanation: A* is optimal if h(n) is an admissible heuristic-that is, provided that h(n) never overestimates the cost to reach the goal. Refer both the example from the book for better understanding of the algorithms.

6. Which search uses only the linear space for searching?

a) Best-first search

b) Recursive best-first search

c) Depth-first search

d) None of the mentioned

Answer: b

Explanation: Recursive best-first search will mimic the operation of standard best-first search, but using only the linear space

7. Which is used to improve the performance of heuristic search?

a) Quality of nodes

b) Quality of heuristic function

c) Simple form of nodes

d) None of the mentioned

Answer: b

Explanation: Good heuristic can be constructed by relaxing the problem, So the performance of heuristic search can be improved.

8. Zero sum game has to be a _____ game.

a) Single player

b) Two player

c) Multiplayer

d) Three player

View Answer

Answer: c

Explanation: Zero sum games could be multiplayer games as long as the condition for zero sum game is satisfied.

9. A game can be formally defined as a kind of search problem with the following components:

a) Initial State

b) Successor Function

c) Terminal Test

d) Utility Function

Answer: a, b, c, d

Explanation: The initial state includes the board position and identifies the player to move. A successor function returns a list of (move, state) pairs, each indicating a legal move and the resulting state. A terminal test determines when the game is over. States where the game has ended are called terminal states. A utility function (also called an objective function or payoff function), which gives a numeric value for the terminal states. In chess, the outcome is a win, loss, or draw, with values +1, -1, or 0.

10. Knowledge and reasoning also play a crucial role in dealing with _____ environment.

a) Completely Observable

b) Partially Observable

c) Neither a nor b

d) Only a and b

Answer: b

Explanation: Knowledge and reasoning could aid to reveal other factors that could complete environment.

11. Treatment chosen by doctor for a patient for a disease is based on

a) Only current symptoms

b) Current symptoms plus some knowledge from the textbooks

c) Current symptoms plus some knowledge from the textbooks plus experience

d) Only a and b

Answer: c

12. From which rule does the modus ponens are derived?

a) Inference rule

b) Module rule

c) Both a & b

d) None of the mentioned

Answer: a

Explanation: Inference rule contains the standard pattern that leads to desired goal. The best form of inference rule is modus ponens.

13. Which is also called single inference rule?

a) Reference

b) Resolution

c) Reform

d) None of the mentioned

Answer: b

Explanation: Because resolution yields a complete inference rule when coupled with any search algorithm.

14. A _____ is used to demonstrate, on a purely syntactic basis, that one formula is a logical consequence of another formula.

a) Deductive Systems

b) Inductive Systems

c) Reasoning with Knowledge Based Systems

d) Search Based Systems

Answer: a

Explanation: Refer the definition of Deductive based systems.

15. ‘α |= β ‘(to mean that the sentence α entails the sentence β) if and only if, in every model in which α is _____, β is also _____.

a) True, true

b) True, false

c) False, true

d) False, false

Answer: a

Explanation: Refer the definition of law of entailment.

16. _____ is/are the well known Expert System/s for medical diagnosis systems

a) MYSIN

b) CADUCEUS

c) DENDRAL

d) SMH.PAL

Answer: a, b

Explanation: None.

17. The main components of the expert systems is/are,

a) Inference Engine

b) Knowledge Base

c) Only a)

d) Both a) & b)

Answer: d

Explanation: Look at the general architecture of rule based expert system

18. In partial order plan,

a. Relationships between the actions of the behavior are set prior to the actions

b. Relationships between the actions of the behavior are not set until absolutely necessary

Choose the correct option.

a) a. is true

b) b. is true

c) Either a. or b. can be true depending upon situation

d) Neither a. nor b. is true

Answer: a

Explanation: Relationship between behavior and actions is established dynamically.

19. Which of the following search belongs to totally ordered plan search?

a) Forward state-space search

b) Hill-climbing search

c) Depth-first search

d) Breadth-first search

Answer: a

Explanation: Forward and backward state-space search are particular forms of totally ordered plan search.

20. Which strategy is used for delaying a choice during search?

a) First commitment

b) Least commitment

c) Both a & b

d) None of the mentioned

Answer: b

Explanation: The general strategy of delaying a choice during search is called a least commitment strategy.

21. Which algorithm place two actions into a plan without specifying which should come first?

a) Full-order planner

b) Total-order planner

c) Semi-order planner

d) Partial-order planner

Answer: d

Explanation: Any planning algorithm that can place two actions into a plan without specifying which should come first is called partial-order planner.

22.DEC advertises that it helped to create "the world's first expert system routinely used in an industrial environment," called XCON or:

a) PDP-11

b) Rl

c) VAX

d) MAGNOM

Answer: b

23. Prior to the invention of time-sharing, the prevalent method of computer access was:

a) batch processing

b) telecommunication

c) remote access

d) All of the mentioned

Answer: a

24. _____ algorithm translates a planning problem in to prepositional axioms.

a) GraphPlan

b) SatPlan

c) Greedy

d) None of the mentioned

Answer: b

Explanation: The SATPLAN algorithm translates a planning problem into propositional axioms and applies a satisfiability algorithm to find a model that corresponds a valid plan.

25. Which can be adapted for planning algorithm?

a) Most-constraint variable

b) Most-constraint literal

c) Constraint

d) None of the mentioned

Answer: a

Explanation: The most-constraint variable heuristic from CSPs can be adapted for planning algorithm and seems to work well

26. How many terms are required for building a bayes model?

a) 1

b) 2

c) 3

d) 4

Answer : c

Explanation : The three required terms are a conditional probability and two unconditional probability.

27. What is needed to make probabilistic systems feasible in the world?

a) Reliability

b) Crucial robustness

c) Feasibility

d) None of the mentioned

Answer : b

Explanation : On a model-based knowledge provides the crucial robustness needed to make probabilistic system feasible in the real world.

28. Where does the baye's rule can be used?

a) Solving queries

b) Increasing complexity

c) Decreasing complexity

d) Answering probabilistic query

Answer : d

Explanation : Bayes rule can be used to answer the probabilistic queries conditioned on one piece of evidence

29. A 3-input neuron is trained to output a zero when the input is 110 and a one when the input is 111. After generalization, the output will be zero when and only when the input is:

a) 000 or 110 or 011 or 101

b) 010 or 100 or 110 or 101

c) 000 or 010 or 110 or 100

d) 100 or 111 or 101 or 001

Answer: c

Explanation: The truth table before generalization is:

Inputs Output

000 $

001 $

010 $

011 $

100 $

101 $

110 0

111 1

where $ represents don’t know cases and the output is random.

After generalization, the truth table becomes:

Inputs Output

000 0

001 1

010 0

011 1

100 0

101 1

110 0

111 1

30. A perceptron is:

a) 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

Answer: a

Explanation: The perceptron is a single layer feed-forward neural network. It is not an auto-associative network because it has no feedback and is not a multiple layer neural network because the pre-processing stage is not made of neurons.

31. An auto-associative network is:

a) a neural network that contains no loops

b) a neural network that contains feedback

c) a neural network that has only one loop

d) a single layer feed-forward neural network with pre-processing

Answer: b

Explanation: An auto-associative network is equivalent to a neural network that contains feedback. The number of feedback paths(loops) does not have to be one.

32. A 4-input neuron has weights 1, 2, 3 and 4. The transfer function is linear with the constant of proportionality being equal to 2. The inputs are 4, 10, 5 and 20 respectively. The output will be:

a) 238

b) 76

c) 119

d) 123

Answer: a

Explanation: The output is found by multiplying the weights with their respective inputs, summing the results and multiplying with the transfer function. Therefore:

Output = 2 * (1*4 + 2*10 + 3*5 + 4*20) = 238.

33. What is the intentional exchange of information brought about by production

and perception?

a) Hearing

b) Communication

c) Speech

d) None of the mentioned

Answer : b

Explanation : Communication is the intentional exchange of information brought about by production and perception of signs drawn from a shared system.

34. What is the complex system of structured message?

a) Languages

b) Words

c) Signs

d) Speech

Answer : a

Explanation : Language is the complex system of structured message that enables us to communicate.

35. How many things are present in conventional communication signs?

a) 3

b) 4

c) 5

d) 6

Answer : c

Explanation : The five things present in the conventional communication system are query, inform, request, acknowledge and promise.

35. What is defined by set of strings?

a) Signs

b) Formal language

c) Communication

d) None of the mentioned

Answer : b

Explanation : A formal language is defined by set of strings that is a concatenation of terminal symbols.

36. Which condition is used to cease the growth of forward chaining?

a) Atomic sentences

b) Complex sentences

c) No further inference

d) All of the mentioned

Answer : c

Explanation : Forward chain can grow by adding new atomic sentences until no further inference is made.

37. Which closely resembles propositional definite clause?

a) Resolution

b) Inference

c) Conjunction

d) First-order definite clauses

Answer : d

Explanation : Because they are disjunction of literals of which exactly one is positive.

3. What is the condition of variables in first-order literals?

a) Existentially quantified

b) Universally quantified

c) Both a & b

d) None of the mentioned

Answer : b

Explanation : First-order literals will accept variables only if they are universally quantified.

38. Which are more suitable normal form to be used with definite clause?

a) Positive literal

b) Negative literal

c) Generalized modus ponens

d) Neutral literal

Answer : c

Explanation : Definite clauses are a suitable normal form for use with generalized modus pones.

39. A.M Turing developed a technique for determining whether a computer could or could not demonstrate the artificial intelligence. Presently this technique is called?

a) Turing test

b) Algorithm

c) Boolean algebra

d) Logarithm

Answer: a

40. When talking to a speech recognition program, the program divides each second of your speech into 100 separate:

a) Codes

b) Phonemes

c) Samples

d) Words

Answer: c

41. Which term is used for describing the judgmental or commonsense part of problem solving?

a) Heuristic

b) Critical

c) Value based

d) Analytical

Answer: a

42. Which stage of the manufacturing process has been described as “the mapping of function onto form”?

a) Design

b) Distribution

c) project management

d) field service

Answer: a

43. 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 the mentioned

Answer : b

Explanation : Because of FIFO queue, it will assure that the nodes that are visited first will be expanded first

44. Which search strategy is also called as blind search?

a) Uninformed search

b) Informed search

c) Simple reflex search

d) All of the mentioned

Answer : a

Explanation : In blind search, We can search the states without having any additional information. So uninformed search method is blind search.

45. What are not present in finish actions?

a) Preconditions

b) Effect

c) Finish

d) None of the mentioned

Answer: b

Explanation: Finish has no effects and has as its preconditions the goal literals of the planning algorithm.

46. Which can be adapted for planning algorithm?

a) Most-constraint variable

b) Most-constraint literal

c) Constraint

d) None of the mentioned

Answer: a

Explanation: The most-constraint variable heuristic from CSPs can be adapted for planning algorithm and seems to work well.

47. Why is the XOR problem exceptionally interesting to neural network researchers?

a) Because it can be expressed in a way that allows you to use a neural network

b) Because it is complex binary operation that cannot be solved using neural networks

c) Because it can be solved by a single layer perceptron

d) Because it is the simplest linearly inseparable problem that exists.

Answer: d

48. What is back propagation?

a) It is another name given to the curvy function in the perceptron

b) It is the transmission of error back through the network to adjust the inputs

c) It is the transmission of error back through the network to allow weights to be adjusted so that the network can learn.

d) None of the mentioned

Answer: c

Explanation: Back propagation is the transmission of error back through the network to allow weights to be adjusted so that the network can learn.

49. Why are linearly separable problems of interest of neural network researchers?

a) Because they are the only class of problem that network can solve successfully

b) Because they are the only class of problem that Perceptron can solve successfully

c) Because they are the only mathematical functions that are continue

d) Because they are the only mathematical functions you can draw

Answer: b

Explanation: Linearly separable problems of interest of neural network researchers because they are the only class of problem that Perceptron can solve successfully

50. Which of the following is not the promise of artificial neural network?

a) It can explain result

b) It can survive the failure of some nodes

c) It has inherent parallelism

d) It can handle noise

Answer: a

Explanation: The artificial Neural Network (ANN) cannot explain result

Descriptive questions

1. What is a Knowledge Based System? Explain.
2. List a few of the task domains of AI.
3. Describe the components of a KBS.
4. What id meta-knowledge?
5. Expand LISP and PROLOG.
6. What is a Production System?
7. Define state-space search technique.
8. List the steps in performing a state-space search.
9. What is heuristic search?
10. Differentiate Informed & Uninformed search. Give examples.
11. Define the logic behind – Hill climbing, Best-First Search, BFS and DFS
12. What is PEAS? Explain different agent types with their PEAS descriptions. (16)
13. Explain in detail the properties of Task Environments
14. Differentiate prepositional & predicate logic.
15. What is clausal form? How is it useful?
16. Define a well-formed formula (wff).
17. List some of the rules of inference.
18. What is resolution /refutation?

19. Define unification.
20. What are semantic nets?
21. What are frames? How do they differ from semantic nets?
22. What are script? What is its use?
23. List the components of a script.
24. Mention the frame manipulation primitives.
25. Define forward and backward chaining. Differentiate the same
26. Describe Bayes theorem.
27. Define Non monotonic reasoning.
28. What are Truth Maintenance Systems? Draw its block diagram.
29. What are Bayesian networks? Give an example.
30. What is fuzzy logic? What is its use?
31. How Knowledge is represented?
32. What is propositional logic?
33. Define Natural Language generation.
34. List any two NLP systems.
35. Define the terms a) Communications (b) Speech act (c) Formal Language and (d) Grammar