Artifical Intelligence Multiple choice answers.

Artificial Intelligence (SRM Institute of Science and Technology)

15CS401-ARTIFICIAL INTELLIGENCE

QUESTION BANK

UNIT-1

INTRODUCTION

ONE MARK MCQ

1	Which is defined as the study of how to make computers do things which at the moment, people do better. a) Intelligent System b)Intelligent Agent c)Knowledge Transmission **d)Artificial Intelligence** Answer: **d)Artificial Intelligence**	Page No-2 [IO-1] [SO-a]	L1
2	What Model deal with the computer knowledge based model for Artificial Intelligence? a) Logistic b)Linear **c)Cognitive** d)Learning Vector Answer: **c)Cognitive**	Page No-3 [IO-1] [SO-a]	L1
3	Identify the person who insisted and made AI topic for conference at Dartmouth in 1956 a)Allan Turing b)Zuse c)Aristotle **d)John McCarthy** Answer: **d)John McCarthy**	Page No-4 [IO-1] [SO-a]	L1
4	Which one may become very difficult in all the problems and also there is very little commonality among different problems. **a)Generalisation** b)Localization c)Patronization d)Modularization Answer: **a)Generalisation**	Page No-6 [IO-1] [SO-a]	L1
5	Identify the problems that yield a right answer when an appropriate algorithm is applied. a)Structured **b)Well Structured** c)ill-Structured d) Unstructured Answer: **b)Well Structured**	Page No-7 [IO-1] [SO-a]	L1
6	Identify the problem that has the possibility of more than one answer and even a particular situation decides the correctness of the answer. a)Structured b)Well Structured **c)ill-Structured** d) Unstructured Answer: **c)ill-Structured**	Page No-7 [IO-1] [SO-b]	L1
7	Which problem are the ones which definitely have a solution and there will	Page No-9	L1

	not be any solution. a)Structured b)Well Structured **c)Linear** d) Non-Linear Answer: **c)Linear**	[IO-1] [SO-b]	
8	Which Models are based on sign processes or signification and communication? a)Syntactic b)Semantic **c)Semiotic** d)Statistical Answer: **c)Semiotic**	Page No-10 [IO-1] [SO-a]	L1
9	Which Model employs probabilistic approaches and typically a collection of probability density functions and distribution functions. a)Syntactic b)Semantic c)Semiotic **d)Statistical** Answer: **d)Statistical**	Page No-10 [IO-1] [SO-a]	L1
10	The extraction of meaningful information that is previously unknown and can be very useful potential ahead is known as _____ **a)Knowledge Discovery** b)Machine Learning c)Learning Theory d)Neural Computation Answer: **a)Knowledge Discovery**	Page No-11 [IO-1] [SO-a]	L1
11	Select the one which finds its application from the telecom domain to the financial decision making with optimization as the base criterion. a)Mining b)Neural **c)Evolutionary** d)Discovery Answer: **c)Evolutionary**	Page No-11 [IO-1] [SO-a]	L1
12	An_____ is the one which is flexible in terms to get the desired outcome. **a)Intelligent agent** b)Multi-agent c)Multi-Perspective agent d)Decision-Making agent Answer: **a)Intelligent agent**	Page No-12 [IO-1] [SO-a]	L1
13	Which Process consists of sequence of well-defined method that can handle doubts, uncertainty, ambiguity and help in achieving the desired goal? **a)Problem-solving** b)Problem-Understanding c)Problem Representation d)Problem Formulation Answer: **a)Problem-solving**	Page No-17 [IO-1] [SO-b]	L1
14	Select the method which is applicable to a wide variety of problems and its means-ends analysis. a) Register purpose b)Planning purpose c)Special purpose **d)General purpose** Answer: **d)General purpose**	Page No-16 [IO-1] [SO-a]	L1
15	Problem _____ precisely tells us what the achievable goal is and what the information is to be used during the solution process. a)Definition **b)Identification** c)Analysis d)Representation Answer: **b)Identification**	Page No-18 [IO-1] [SO-a]	L1

16	Which State is fully observable and it goes to one definite after any action. **a)Deterministic** b)Non-Observable c) Partially Observable d)Unknown State Space Answer: **a)Deterministic**	Page No-20 [IO-1] [SO-a]	L1
17	Name the State that has a solution which is based on searching the tree and finding out the path for solution. a)Deterministic b)Non-Observable **c) Partially Observable** d)Unknown State Space Answer: **c) Partially Observable**	Page No-21 [IO-1] [SO-a]	L1
18	Identify problem analysis that must be able to restrict and define boundaries clearly? **a)Compactness** b)Utility c)Completeness d)Transparency Answer: **a)Compactness**	Page No-21 [IO-1] [SO-b]	L1
19	Which problem analysis that deals the reasoning with the representation efficiency? a)Compactness b)Utility c)Completeness **d)Transparency** Answer: **d)Transparency**	Page No-21 [IO-1] [SO-b]	L1
20	A general approach for solving a large and complex problem is to decompose it into some smaller problems is known as _____ a)Problem Analysis b)Problem Identification c)Problem Representation **d)Problem Reduction** Answer: **d)Problem Reduction**	Page No-31 [IO-1] [SO-a]	L1

FOUR MARK MCQ

1	To solve the Decision Problems, AI can be defined in Broad Categorization (i) Machines can think and have capability to react like humans (ii) Systems that not respond intelligently in the same way as	Page No-3 [IO-1] [SO-b]	L2

	the humans do (iii) Computational models to solve various complex decision making problems (iv) Study of intelligent agents. a) Statement (i),(ii),(iii) are correct **b) Statement (i),(iii),(iv) are correct** c) Statement (ii),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct		
2	The AI Techniques need to build from the problem solving viewpoints. (i) Need for analysis of voluminous and large amount of data (ii)Dealing with constantly changing scenarios and situations (iii)The system and technique should not react to the new scenario and situation. (iv) The Situations are dynamic in nature and static handling may not be useful. a) Statement (i),(ii),(iii) are correct b) Statement (ii),(iii),(iv) are correct c) Statement (i),(ii),(iv) are correct **d) Statement (i),(ii),(iv) are correct**	Page No-6 [IO-1] [SO-b]	L2
3	The following problems are right inference when we can choose the well-structured algorithm is given below (i) Calculating the path of trajectory when a missile is fired (ii) Solving a quadratic equation to find out the value of X (iii)Network flow analysis problem	Page No-7 [IO-1] [SO-b]	L2

	(iv) Identifying the security threats in big social gathering **a) Statement (i),(ii),(iii) are correct** b) Statement (ii),(iii),(iv) are correct c) Statement (i),(ii),(iv) are correct d) Statement (i),(ii),(iv) are correct		
4	Data Acquisition and Machine Learning will support the following AI Learning Methods (i) Knowledge Discovery-Data Mining (ii) Computational Learning Theory (iii) Multi-Perspective Integrated Intelligence (iv) Natural Language Processing **a) Statement (i),(ii),(iii) are correct** b) Statement (ii),(iii),(iv) are correct c) Statement (i),(ii),(iv) are correct d) Statement (i),(ii),(iv) are correct	Page No-10 [IO-1] [SO-b]	L2
5	The different types of problems can be categorized that can be used in problem solving is given below (i) Deterministic (ii) Formulating Problems (iii) Unknown state space (iv) Non Deterministic a) Statement (i),(ii),(iii) are correct b) Statement (ii),(iii),(iv) are correct	Page No-20 [IO-1] [SO-b]	L2

	c) Statement (i),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct		
6	The following criteria that should satisfy in problem statement. (i) Consistency and Availabity (ii) Utility and Soundness (iii) Soundness and Transparency (iv) Compactness and Completeness a) Statement (i),(ii),(iii) are correct **b) Statement (ii),(iii),(iv) are correct** c) Statement (i),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct	Page No-21 [IO-1] [SO-b]	L2
7	The following issues are observed while designing the search problem (i) Rule Selection (ii) State Representation and Identifying Relationships among the states (iii) Proper Selection of forward and backward moment to find the goal state (iv) The goal of state space search is clearly indicated. **a) Statement (i),(ii),(iii) are correct** b) Statement (ii),(iii),(iv) are correct c) Statement (i),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct	Page No-27 [IO-1] [SO-b]	L2

8	The following three outcomes of a problem solver during the performance measuring is given below (i) To finding a solution (ii) Terminating with failure after search space is exhausted (iii) To solve the issues in design of search programs (iv) Hitting a time bound like terminating after certain number of iterations. a) Statement (i),(ii),(iii) are correct b) Statement (ii),(iii),(iv) are correct c) Statement (i),(iii),(iv) are correct **d) Statement (i),(ii),(iv) are correct**	Page No-26 [IO-1] [SO-b]	L2
9	The following aspects used in input knowledge for the knowledge designing are (i) Method Specific Knowledge (ii) Requirements (iii) Constraints (iv) Technology a) Statement (i),(ii),(iii) are correct **b) Statement (ii),(iii),(iv) are correct** c) Statement (i),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct	Page No-23 [IO-1] [SO-b]	L2
10	The steps to be followed for finding the formulating problems (i) Problem Identification and problem definition (ii) Problem space (iii) Task Knowledge and State Space	Page No-19 [IO-1] [SO-b]	L2

	(iv) Problem Analysis **a) Statement (i),(ii),(iii) are correct** b) Statement (ii),(iii),(iv) are correct c) Statement (i),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct		

12 MARK MCQ

(Each sub division carrying 4 marks)

1	**One important aspect of building AI solutions is modelling the problem. Consider AI models, complexity and applications for the following. (12 marks)** **(I) With respect to Semiotic Models,** (i) These models are based on sign processes or signification and communication (ii) The process of carrying meaning depends on codes (iii) It employs probabilistic approaches (iv) In computers, these signs are determined for a logical sequence a) Statement (i),(ii),(iii) are correct b) Statement (ii),(iii),(iv) are correct c) Statement (i),(iii),(iv) are correct	Page No-09 [IO-1] [SO-a]		L2

	d) Statement (i),(ii),(iv) are correct Ans: d **(II) With respect to Statistical Models,** (i) It refers to representation and formalization of relationships through statistical techniques (ii) The process of carrying meaning depends on codes (iii) It employs probabilistic approaches (iv) Various learning models from AI perspective can be developed based on this similar kind a) Statement (i),(ii),(iii) are correct b) Statement (ii),(iii),(iv) are correct **c) Statement (i),(iii),(iv) are correct** d) Statement (i),(ii),(iv) are correct **Ans: c** **(III) Regarding Model building and Complexity** (i) Mapping is less complex than discovering relationships (ii) The level of complexity increases for mapping from identifying the relationships (iii) AI application building is more complex than Knowledge based model building (iv) Models used for applications like chess programs were not effective for other applications a) Statement (i),(ii),(iii) are correct **b) Statement (ii),(iii),(iv) are correct**			

	c) Statement (i),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct **Ans: b**			
2	**The field of AI comprises many fascinating areas but problem solving is fundamental to many of the AI based applications. Consider the problem solving process, formulating problems & its types. (12)** **(I) The term 'problem' is used, when the desired objective is not obvious. It can be defined with following conditions:** (i) Every problem is defined in a context (ii) Every problem has a well-defined objective (iii) The solution to every problem does not consist of a set of activities (iv)Finally, initial state approaches the goal situation a) Statement (i),(ii),(iii) are correct b) Statement (ii),(iii),(iv) are correct c) Statement (i),(iii),(iv) are correct **d) Statement (i),(ii),(iv) are correct Ans: d** **(II) Identification of the problem is the first step in problem-solving process. Consider the following statements.** (i) A problem statement will not have description of data, method, procedures and algorithms (ii) Every problem has certain initial conditions from which different actions are initiated. (iii) Specification of achievable objective is very important (iv) Solution to any problem is the collection of	Page No-17 [IO-1] [SO-a]		L2

	such different states and set of operations a) Statement (i),(ii),(iii) are correct **b) Statement (ii),(iii),(iv) are correct** c) Statement (i),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct **Ans: b** **III) With regard to Problem type and characteristics** (i) In single state problem, Each state is fully observable and it goes to one definite state after any action (ii) Non-observable type of problem come under multiple-state problem (iii)Movement of the cleaner will be a tree that that would be based on its current percept (iv)Unknown state space problems are not typically exploration problems **a) Statement (i),(ii),(iii) are correct** b) Statement (ii),(iii),(iv) are correct c) Statement (i),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct **Ans: a**			
3	**A problem representation is a complete view of the problem and approach to solve it. Consider the following statements based on problem analysis and representation, performance measuring, problem space and search**	Page No-21 [IO-1] [SO-a]		L2

	(I) The performance of any intelligent system depends on the problem representation and formulation (i) It needs to define clearly the solution space (ii) It need not to be compatible with the existing systems (iii) It should not raise false alarm for intrusion or fire (iv)It should not loose information about the visitors or the historical information of previous instances a) Statement (i),(ii),(iii) are correct b) Statement (ii),(iii),(iv) are correct **c) Statement (i),(iii),(iv) are correct** d) Statement (i),(ii),(iv) are correct **Ans: c** **(II) Regarding Problem representation with different aspects** (i) It needs Machine language so as to describe the logic and specific encoding rules for the problems (ii) Problem solver is an algorithm or a methodology that accepts problem description and domain description (iii)In case of Tower of Hanoi, Problem instances are not the initial and goal states of the problem (iv)Problem specific knowledge includes explicit representations of all the objects, classes, their relations, constraints, etc, a) Statement (i),(ii),(iii) are correct			

	b) Statement (ii),(iii),(iv) are correct c) Statement (i),(iii),(iv) are correct **d) Statement (i),(ii),(iv) are correct Ans: d** **(III) Consider Problem space and search** (i) In informed search, there is a high probability of getting a solution (ii) Uninformed strategy generates all possible states in the state space and checks for the goal state (iii)There should be transparency in describing the rules and they should be as generalized as possible (iv) Backward movement is not required to determine optimal path to goal state **a) Statement (i),(ii),(iii) are correct** b) Statement (ii),(iii),(iv) are correct c) Statement (i),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct **Ans: a**			
4	**While playing Toy problem, its environment is controlled. Consider the following statements** **(I) With regard to Tic-tac-toe problem,** (i) The player who puts respective mark in a horizontal or vertical line only wins the game (ii) The player who puts respective mark in a	Page No-28 [IO-1] [SO-b]		L3

	horizontal or vertical or diagonal line wins the game (iii) It is a 3*3 grid & three player game (iv)It is a two player game a) Statement (ii),(iii) are correct **b) Statement (ii),(iv) are correct** c) Statement (i),(iii) are correct d) Statement (i),(ii),(iv) are correct **Ans: b** **(II) For Missionaries and Cannibals problem,** (i) Three missionaries and three cannibals are on one side of a river (ii) Two missionaries and Two cannibals are on one side of a river (iii) A maximum of two objects can travel to other side in the boat (iv)A maximum of three objects can travel to other side in the boat a) Statement (i),(ii) are correct b) Statement (ii),(iii),(iv) are correct **c) Statement (i),(iii) are correct** d) Statement (iii),(iv) are correct **Ans: c** **(III)Regarding Missionaries and Cannibals problem,**			

	(i) Initial state can be (2, 3,1) (ii) Final state can be (0,0,0) (iii)Initial state can be (3, 3,1) (iv)Final state can be (0,1,0) a) Statement (i),(ii) are correct **b) Statement (ii),(iii) are correct** c) Statement (i),(ii),(iii) are correct d) Statement (i),(ii),(iv) are correct **Ans: b**			
5	**The research on problem solving actually focuses on capturing properties of real-world problems. Consider the following statements** **(I) With respect to Route finding** (i) Route finding algorithms are used in applications like airline travel planning and car systems (ii) Video streaming in computer network does not use route finding algorithms (iii) The objective is to arrive to a destination with the minimum cost (iv) Commercial travel systems can't use backup reservations on alternative flights for airline travel planning a) Statement (i),(ii) are correct **b) Statement (i),(iii) are correct** c) Statement (i),(ii),(iii) are correct d) Statement (i),(ii),(iii),(iv) are correct **Ans: b** **(II) Regarding Travelling salesman problem,**	Page No-30 [IO-1] [SO-b]		L3

	(i) The main objective is to find a tour – the shortest one (ii) The problem solving does not need to cover all the cities to minimize the cost (iii) In the problem solving, we need not return back to starting city after traversing each city (iv)In problem formulation, Initial and goal state will be the same a) Statement (i),(ii) are correct b) Statement (ii),(iii) are correct **c) Statement (i),(iv) are correct** d) Statement (ii),(iii),(iv) are correct **Ans: c** **(III) With respect to Problem reduction methods,** (i) Problem reduction method can be applied to applications which follow top-down decision making (ii) Problem reduction method can be applied to applications which follow bottom-up decision making (iii) Problem reduction is a strategic approach to reduce complexity of a problem (iv)Problem reduction is not a strategic approach to reduce complexity of a problem but it is a simple technique a) Statement (i),(ii) are correct **b) Statement (i),(iii) are correct** c) Statement (ii),(iii) are correct d) Statement (ii),(iv) are correct **Ans: b**			

6	**Data acquisition and different learning aspects in AI** **(I) Knowledge discovery – Data mining and Machine learning** (i) Information can be referred as pattern underlying data (ii) Knowledge discovery is the extraction of information that is previously known (iii) Knowledge discovery is the extraction of meaningful information that is previously unknown (iv) Interpreting the pattern is a part of data mining process a) Statement (i),(ii),(iii) are correct b) Statement (ii),(iii),(iv) are correct **c) Statement (i),(iii),(iv) are correct** d) Statement (i),(ii),(iv) are correct **Ans: c** **(II) Computational learning theory (COLT)** (i) In COLT, Formal mathematical models are defined (ii) In COLT, Formal mathematical models can't be defined (iii) PAC stands for ' Probably Approximately Correct (PAC)' (iv)The analysis done provides a framework to take appropriate decisions a) Statement (i),(ii),(iii) are correct b) Statement (ii),(iii),(iv) are correct	Page No-10 [IO-1] [SO-a]		L2

	c) Statement (i),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct **Ans: c** **(III) Intelligent and multi agent systems & Multi-perspective integrated intelligence** (i) An agent in simple terms is a software program that assists user (ii) The percept of individual agent is always limited (iii) Information collected from different perspectives can be continuous or discrete (iv) Information collected from different perspectives can be always discrete **a) Statement (i),(ii),(iii) are correct** b) Statement (ii),(iv) are correct c) Statement (i),(iii) are correct d) Statement (i),(ii),(iv) are correct **Ans: a**			

UNIT-2

HEURISTIC SEARCH TECHNIQUES

ONE MARK MCQ

1	AI Problem focuses on the use of intelligence to reach an optimal _____ state called as a)Initial b)Search **c)Goal** d)Final Answer: **c)Goal**	Page No-37 [IO-2] [SO-a]	L1
2	_____is a collection of all possible configurations of the system. a) Action b) Environment **c) State space** d) Goal state Answer: **c) State space**	Page No-39 [IO-2] [SO-a]	L1
3	Which search that process of searching the state space for a solution to reach	Page No-39	L1

	the goal? a)Informed Search **b)State Space Search** c)Uninformed Search d)Heuristic Search Answer: **b)State Space Search**	[IO-2] [SO-b]	
4	Identify the search that has the methods employing the strategy are often referred as data-directed ones. **a)Forward** b)Backward c)Systematic d)Heuristic Answer: **a)Forward**	Page No-40 [IO-2] [SO-b]	L1
5	Which search strategy is used when the search space is small and systematic but not visible. a)Forward b)Backward **c)Systematic** d)Heuristic Answer: **c)Systematic**	Page No-41 [IO-2] [SO-a]	L1
6	Which technique is based on the previous experience and provides guidelines to solve the problems? a)Forward b)Backward c)Systematic **d)Heuristic** Answer: **d)Heuristic**	Page No-41 [IO-2] [SO-b]	L1
7	Identify the search technique where from the root node, all the successors are searched across the level and expanded. **a)Breadth First Search** b) Uniform Cost Search c)Depth First Search d)Depth Limited Search Answer: **a)Breadth First Search**	Page No-42 [IO-2] [SO-b]	L1
8	The space complexity of Depth First search is_____ a)O(bl) b)O(lb) **c)O(bd)** d)O(db) Answer: **c)O(bd)**	Page No-50 [IO-2] [SO-a]	L2
9	Which Search has no guarantee that will give a solution that will be optimal, as it finds the one which is within its limits. a)Breadth First Search b) Uniform Cost Search c)Depth First Search **d)Depth Limited Search** Answer: **d)Depth Limited Search**	Page No-48 [IO-2] [SO-a]	L1

10	Which search algorithm comprises forward search from initial stage and backward one from the goal state. a)Breadth First Search b) Uniform Cost Search **c)Bi-Directional Search** d)Iterative Deeping Search Answer: **c)Bi-Directional Search**	Page No-49 [IO-2] [SO-a]	L1
11	The space complexity of Depth Limited search is_____ **a)O(bl)** b)O(lb) c)O(bd) d)O(db) Answer: **a)O(bl)**	Page No-50 [IO-2] [SO-a]	L2
12	Find the search that allows switching between the paths and gets benefits of the most promising node is done. a)Breadth First Search **b) Best First Search** c)Depth First Search d)Depth Limited Search Answer: **b) Best First Search**	Page No-57 [IO-2] [SO-a]	L1
13	The notation of _____graphs is required in order to avoid the revisiting of paths and for propagating back to the successor. a)AND **b)OR** c)NOT d)XOR Answer: **b)OR**	Page No-57 [IO-2] [SO-a]	L1
14	_____consists of list of nodes that have been generated and on whom the heuristic function has already been applied. **a)Open List** b)Generate List c)Test List d)Closed List Answer: **a)Open List**	Page No-57 [IO-2] [SO-a]	L1
15	When a node is generated, and its required to check that whether it has already been generated by _____ a)Open List b)Generate List c)Test List **d)Closed List** Answer: **d)Closed List**	Page No-57 [IO-2] [SO-a]	L1
16	Evaluation function (f(n)) in A* Search is represented as _____ a) f(n) = h(n) b) f(n) = g(n) * h(n) **c) f(n) = g(n) + h(n)** d) f(n) = max(h(n)) Answer: **c) f(n) = g(n) + h(n)**	Page No-59 [IO-2] [SO-b]	L1

17	Which Search is used to keep track of the f-cost or the f-value of the alternative paths that are available and the search process backtracks if the current path becomes expensive? a) A* b)IDA* c)AO* **d)RBFS** Answer: **d)RBFS**	Page No-66 [IO-2] [SO-b]	L1
18	Identify the search that begins with a random point in search space. **a)Hill Climbing** b)Simulated Annealing c)Local Beam d)Stochastic Answer: **a)Hill Climbing**	Page No-71 [IO-2] [SO-b]	L1
19	A Purely random Walk does not care whether its uphill or downhill and randomly selects a successor. a)Hill Climbing **b)Simulated Annealing** c)Local Beam d)Stochastic Answer: **b)Simulated Annealing**	Page No-75 [IO-2] [SO-a]	L1
20	A space where neighborhood states have the same value as the present state and causes a problem in hill climbing is_____ a) Global maxima **b) Plateau** c) Ridges d) Local Maxima Answer: **b) Plateau**	Page No-73 [IO-2] [SO-a]	L1

FOUR MARK MCQ

1	What are all the possible configurations that is defined in a state space of the system (i) S-Set of nodes for a given problem to reach the solution (ii) A-Set of arcs (iii) I- Set of Initial States (iv) D- Set of Destination states **a) Statement (i),(ii),(iii) are correct** b) Statement (i),(iii),(iv) are correct c) Statement (ii),(iii),(iv) are correct	Page No-39 [IO-2] [SO-b]	L1

d) Statement (i),(ii),(iv) are correct

2	What are the actions executed finally in the agent side? (i) Formulate goal (ii) Formulate the problem which has the goal and the initial stated-→ Sequence of actions (iii) Now search with the given problem--→ Sequence of actions (iv) Action of Sequence--→ Act according to the sequence of actions a) Statement (i),(ii),(iii) are correct **b) Statement (i),(iii),(iv) are correct** c) Statement (ii),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct	Page No-40 [IO-2] [SO-b]	L2
3	What are the parameters are used in the evaluation of search? (i) Correctness and Compactness (ii) Space and time complexity (iii) Optimality and admissibility (iv) Completeness a) Statement (i),(ii),(iii) are correct b) Statement (i),(iii),(iv) are correct **c) Statement (ii),(iii),(iv) are correct** d) Statement (i),(ii),(iv) are correct	Page No-41 [IO-2] [SO-b]	L1
4	The advantages of Breadth First Search is given below (i) Guaranteed to find a solution	Page No-47 [IO-2] [SO-a]	L2

(ii) Depending on the problem

(iii) Need lot of memory for storing the state space

(iv) Can be guaranteed to find an optimal solution

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) Statement (ii),(iii),(iv) are correct

d) Statement (i),(ii),(iv) are correct

5	The disadvantages of Depth First Search is given below (i) Can find solutions in all cases (ii) Sometimes fails to find a solution (iii) Not guaranteed to find an optimal solution (iv) Take lot of time to find a solution a) Statement (i),(ii),(iii) are correct b) Statement (i),(iii),(iv) are correct **c) Statement (ii),(iii),(iv) are correct** d) Statement (i),(ii),(iv) are correct	Page No-48 [IO-2] [SO-a]	L2
6	What are the information needed in the node using OR Graph? (i) Description of the state it represents (ii) Indication how promising it is (iii) Child link that points to the best node it has reached from (iv) List of nodes that are generated from it. a) Statement (i),(ii),(iii) are correct b) Statement (i),(iii),(iv) are correct c) Statement (ii),(iii),(iv) are correct	Page No-57 [IO-2] [SO-b]	L1

d) Statement (i),(ii),(iv) are correct

7	The three main entities used in local search problems are (i) Search Space (ii) Effect of heuristic search (iii) Neighborhood relations (iv) Cost Functions a) Statement (i),(ii),(iii) are correct **b) Statement (i),(iii),(iv) are correct** c) Statement (ii),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct	Page No-70 [IO-2] [SO-a]	L1
8	What are the problems that occurs in hill climbing? (i) Local Maximum (ii)Local Minimum (iii)Plateau (iv) Ridge a) Statement (i),(ii),(iii) are correct **b) Statement (i),(iii),(iv) are correct** c) Statement (ii),(iii),(iv) are correct d) Statement (i),(ii),(iv) are correct	Page No-73 [IO-2] [SO-b]	L1
9	List some of the three variations that comes under the Hill Climbing (i) Stochastic Hill Climbing (ii) First Choice Hill Climbing (iii) Evolutionary Hill Climbing (iv) Local Beam Hill Climbing	Page No-75 [IO-2] [SO-b]	L1

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) Statement (ii),(iii),(iv) are correct

d) Statement (i),(ii),(iv) are correct

10 The time complexity depends totally on the heuristic function are — Page No-65 [IO-2] [SO-a] — L2

(i)Exponential to the length of the solution

(ii) log[h*(n)] is the sub-exponential growth mathematically

(iii) The error of h grows faster than the logarithm

(iv) It is strongly proportional to the cost of the path.

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) Statement (ii),(iii),(iv) are correct

d) Statement (i),(ii),(iv) are correct

12 MARK MCQ

1 **General Search Algorithms – Searching, Agents, Control strategies** — Page No-39 [IO-2] [SO-a] — L2

(I) Searching for solutions

(i) A state space is represented as [S, A, I, G]

(ii) A state space is represented as [I, S, L, G]

(iii) A state space is defined as a set of all states with all possible actions

(iv) A state space is defined as a collection of all possible configurations of the system

a) Statement (ii),(iii) are correct

b) **Statement (i),(iii),(iv) are correct**

c) Statement (ii),(iii),(iv) are correct

d) Statement (ii),(iv) are correct

(II) Problem solving agents

(i) An agent can be termed as an entity that can give only the output for the desired input

(ii) An agent can give output but can't make any decisions

(iii) An agent is an entity that can perceive the environment and act on it

(iv) An agent formulates the goal as well as the problem

a) Statement (ii),(iv) are correct

b) Statement (i),(iv) are correct

c) Statement (i) only correct

d) **Statement (iii),(iv) are correct**

(III) Control strategies help and play a role in the search techniques

(i) The methods employing forward search are often referred to as data-directed ones

(ii) The methods employing backward search are often referred to as data-directed ones

(iii) Search space is blind for systematic search strategy

(iv) DFS follows systematic search

a) Statement (ii),(iv) are correct

b) Statement (i) only correct

c) Statement (ii),(iii),(iv) are correct

d) **Statement (i),(iii),(iv) are correct**

2 **Uninformed search methods** Page No-42 [IO-2] [SO-b] L2

(I) Breadth first Search

(i) Last in First Out(LIFO) technique is used in BFS

(ii) Queue data structure is used to carry out the search

(iii) Time complexity in BFS will be O(b^d)

(iv) If there exists a solution for the problem, then we can say that it has completeness property.

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) **Statement (ii),(iii),(iv) are correct**

d) Statement (i),(iv) only are correct

(II) Uniform cost search

(i) In Uniform cost search, Every edge is having the same cost

(ii) Uniform cost search is expansion of BFS with respect to cost

(iii) In Uniform cost search, Both space and time complexities are of same order

(iv) Time complexity in Uniform cost search will be O(b^d)

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) **Statement (ii),(iii),(iv) are correct**

d) Statement (i),(iv) only are correct

(III) Depth First Search (DFS)

(i) Backtracking can be applied to DFS

(ii) Queue data structure is followed in DFS

(iii) It needs relatively small memory for storing the state-space

(iv) It can't find solution in all cases and sometimes fail to find solution

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) Statement (ii),(iii),(iv) are correct

d) Statement (i),(iv) only are correct

3 **Consider the following statements regarding Depth limited search & Iterative deepening search** Page No-48 [IO-2] [SO-b] L2

(I) Depth limited search

(i) The basic idea is not allowing expansion after the certain depth

(ii) If the depth limit is greater than that of solution's depth, then it is complete

(iii) In DLS, there is no guarantee that the search will give a solution that will be optimal

(iv) Time complexity in DLS will be O(b^d)

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) Statement (ii),(iii),(iv) are correct

d) Statement (i),(iv) only are correct

(II) Iterative deepening search

(i) Iterative deepening is an enhanced version of DLS

(ii) Iterative deepening is an enhanced version of BFS

(iii) Iterative deepening combines the benefit of both BFS & DFS

(iv) BFS is a special case of Iterative deepening search under some constraints

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) Statement (ii),(iii),(iv) are correct

d) Statement (i),(iv) only are correct

(III) Iterative deepening search

(i) IDS is complete and optimal

(ii) Time complexity in IDS will be O(b^d)

(iii) Time complexity in IDS will be O(b^l)

(iv) Higher the branching factor, Lesser is the overhead of expanding the states

a) Statement (i),(ii) only correct

b) Statement (i),(iii),(iv) are correct

c) Statement (i),(ii),(iv) are correct

d) Statement (i),(iv) only correct

4 Optimizing a search problem and optimization of the whole process are challenging tasks. Consider the following statements regarding Informed search — Page No-55 [IO-2] [SO-a] — L2

(I) Generate and test

(i) Informed search techniques are also called Heuristic search

techniques

(ii) Informed search techniques do not always find the best solution

(iii)It is often called the British Museum Method

(iv)In this method, the complete solutions are not generated before testing

a) Statement (ii),(iii),(iv) are correct

b) Statement (i),(iii),(iv) are correct

c) Statement (i),(ii),(iv) are correct

d) **Statement (i),(ii),(iii) are correct**

(II) Best First Search

(i) Best First search is the combination of DFS & BFS

(ii) In DFS, the goal can be reached only when all the states are computed

(iii)In BFS, it gets halted in dead paths

(iv)In BFS, it does not get halted in dead paths

a) Statement (i),(ii) only correct

b) Statement (i),(ii),(iii) only correct

c) Statement (i),(iv) only correct

d) Statement (i),(ii),(iv) only correct

(III) Best First Search & OR Graph

(i) OR Graph is required to avoid the revisiting of paths

(ii) Open list contains nodes that have been generated and on whom heuristic function is not yet applied

(iii)Open list contains nodes that have been generated and on whom heuristic function is applied but not yet examined

(iv) Closed list contains nodes that have already been examined

a) Statement (i),(ii) only correct

b) Statement (i),(ii),(iv) only correct

c) Statement (iii),(iv) only correct

d) Statement (i),(iii),(iv) only correct

5	A* Search – Admissible Heuristic, Consistent Heuristic, Optimality of A*	Page No-59 [IO-2] [SO-b]	L3

(I) A* Search

(i) f(n)=g(n)+h(n)

(ii) A(n)= g(n)+h(n)

(iii) h(n)=A(n)+f(n)

(iv) Best first search is a special case of A* under some constraints

a) Statement (i),(iii),(iv) only correct
b) Statement (i),(iii) only correct
c) Statement (i),(iv) only correct
d) Statement (ii),(iii),(iv) only correct

(II) Admissible Heuristic – Underestimating & overestimating h

(i) Any search algorithm is admissible if it always produces a solution but it need not be optimal
(ii) Any search algorithm is admissible if it always produces an optimal solution
(iii) h(n) is admissible if for all nodes n, h(n)<= h*(n)
(iv) f(Q)=h(Q)+g(Q)

a) Statement (i),(iii),(iv) only correct
b) Statement (ii),(iii) only correct
c) Statement (i),(iii) only correct
d) Statement (ii),(iii),(iv) only correct

(III) Admissible Heuristic – Underestimating & overestimating h

(i) We can guarantee whether h' will under estimate or overestimate A*

(ii) If h'=0, then the A* algorithm, then it leads to BFS

(iii) Heuristic that overestimates the cost is an admissible heuristic

(iv) h(n)<=cost(n,a,s) + h(s)

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) Statement (ii),(iii),(iv) are correct

d) Statement (ii),(iv) only are correct

6	Memory bounded Heuristic Search, AO* search, Local search algorithms and optimization problems	Page No-65 [IO-2] [SO-b]	L2

(I) Memory bounded Heuristic Search

(i) IDA resolves memory problem

(ii) In IDA*, at each iteration DFS is applied

(iii) In IDA*, Prune the node if f(node) > f-limit

(iv) IDA* is optimal in terms of time and space

a) Statement (i),(ii),(iii) only correct

b) Statement (i),(iii),(iv) only correct

c) Statement (ii),(iii),(iv) only **correct**

d) Statement (ii),(iv) only are correct

(II) RBFS, AO* Search

(i) RBFS is a recursive algorithm

(ii) In RBFS, for each c(child_curr_node),

f[c]=maximum(g(c) + h(c) + f[curr_node])

(iii)A* algorithm uses only the open list to maintain the node status

(iv)AO* maintains the entire graph that has been generated till the current state

a) Statement (i),(ii) only correct

b) Statement (iii),(iv) only correct

c) Statement (i),(ii),(iv) only correct

d) Statement (ii),(iii),(iv) only correct

(III) Local search algorithms and optimization problems

(i) Neighborhood relation is not a part of local search problem

(ii) In hill climbing, the search begins with a random point in search space

(iii) Gradient search considers all possible moves from the current state and selects the best one

(iv)In gradient descent model, the random jumps are increased slowly to get an optimal solution

a) Statement (i),(iii),(iv) only correct
b) Statement (ii),(iii) only correct
c) Statement (i),(iii) only correct
d) Statement (ii),(iii),(iv) only correct

UNIT-3

KNOWLEDGE AND REASONING

ONE MARK MCQ

1	Identify the set of patterns and associations derived from data or information that helps in making decisions A) Agent B) Knowledge C) Reasoning D) Planning **Ans: B**	Page No-134 [IO-3] [SO-a]	L1
2	Find the way that we conclude on different aspects of problems based on the available knowledge representation A) Approach B) Issue C) Reasoning D) Fact **Ans: C**	Page No-135 [IO-3] [SO-a]	L1
3	The fact can be mapped into the relations and stored in the database is	Page No-136 [IO-3] [SO-a]	L1

	known as A) Inheritable knowledge B) Semantic Knowledge C) Relational knowledge structure D) Hierarchy structure **Ans: C**		
4	Which one that makes the knowledge representative? A) Logic B) Goal C) Fact D) Agent **Ans: A**	Page No-136 [IO-3] [SO-a]	L1
5	All the knowledge related to the inheritance is not mapped in the eariler case is known as A) Inheritable knowledge structure B) Procedural knowledge structure C) Inferential knowledge structure D) Relational knowledge structure **Ans: A**	Page No-137 [IO-3] [SO-a]	L1
6	who acts according to the environment? A) Action B) Agent C) Role D) Knowledge **Ans: B**	Page No-139 [IO-3] [SO-a]	L1
7	Who plays an important role in deciding the actions? A) Knowledge Base B) Knowledge byte C) Relation D) Structure **Ans: A**	Page No-139 [IO-3] [SO-a]	L1
8	Which is basically a cave that has some rooms connected to each other by passways. A) Dump world B) Logic world C) Wumpus world D) Knowledge world **Ans: C**	Page No-140 [IO-3] [SO-a]	L1
9	The logic that is concerned with the propositions and their relationships. A) Relational logic B) Knowledge logic C) Propositional logic D) Agent logic **Ans: C**	Page No-142 [IO-3] [SO-a]	L1
10	Name the one which tells about the rules to determine the truth of a sentence. A) Syntax B) Semantics C) Logic D) Value	Page No-144 [IO-3] [SO-a]	L2

Ans: B

11	Which one basically defines the allowable sentence. A) Syntax B) Semantics C) Logic D) Value	Page No-144 [IO-3] [SO-a]	L1

Ans: A

12	Which is needed to enumerate the model? A) Logic B) Agent C) Inference D) Knowledge	Page No-145 [IO-3] [SO-a]	L1

Ans: C

13	A _____ states that the sentence is true if it is true in all models. A) Tautology B) Contradiction C) Satisfiability D) Proposition	Page No-146 [IO-3] [SO-b]	L1

Ans: A

14	. The proposition is always false in _____ A) Tautology B) Contradiction C) Satisfiability D) Proposition	Page No-146 [IO-3] [SO-a]	L1

Ans: B

15	A sentence or a proposition is satisfiable if it is true for some models. A) Tautology B) Contradiction C) Satisfiability D) Proposition	Page No-146 [IO-3] [SO-a]	L1

Ans: C

16	If the process starts with the known fact then it is known as___ A) Forward chaining B) Backward chaining C) Resolutin D) Semantics	Page No-150 [IO-3] [SO-a]	L1

Ans: A

17	Select the process of reasoning from one particular object to another. A) Analogical reasoning B) Induction reasoning C) Hypothetical reasoning D) common sense reasoning	Page No-166 [IO-3] [SO-a]	L1

Ans: A

18	Name the logic allows to describe the objects involved and their relationship. A) Propositional logic B) Fact C) Syntax D) Predicate logic	Page No-150 [IO-3] [SO-a]	L1

Ans: D

19	Select the process of finding the substitutions that makes different logical sentences look identical A) Lifting B) Unification C) Reduction D) Inference	Page No-155 [IO-3] [SO-a]	L1

Ans: B

20	Which is a clause that is disjunction of literals of which at most one positive literal exists. A) Horn clause B) Float clause C) Analog clause D) Semantic clause **Ans: A**	Page No-167 [IO-3] [SO-a]	L1

FOUR MARK MCQ

1	**What do you think about the main objective or the goal to be achieved by AI Agent?** a. Perceiving data from the environment b. Adapting to the environment and situations c. Acting upon the Environment d. Reversing the previously performed actions **Ans:d**	Page No-139 [IO-3] [SO-b]	L2
2	**KB representation will be able to handle which sort of environment** i) limited and partial information is available from the beginning ii) limited and the partial information that can be evolved later on iii) Specific relative information available iv) Inheritable information available from the beginning that can be evolved a) Statement (i),(iii) are correct b) Statement (ii),(iii) are correct c) Statement (ii) is correct d) Statement (i) is correct **Ans: c**	Page No:135 [IO-3] [SO-a]	L2

3	**Though selecting a knowledge structure that matches a particular problem is very difficult identify few methods that apprise their inter relationship** i) Percept, pointers ii) Indexing ,attributes and objects iii) Granularity ,Attribute, relation iv) Indexing , pointer, selection a) Statement (i),(ii),(iii) are correct b) Statement (iii),(iv) are correct c) Statement (i),(iii) are correct d) Statement (i),(ii) are correct **Ans:b**	Page No-138 [IO-3] [SO-b]	L2
4	**We need to perform a matching that has to be carried out between current state and Precondition of the rules ,but you have to consider that the matching that we require where Precondition describe the properties that are not mentioned in current state** a. Matching with variables b. Indexing c. Conflict Resolution d. Appropriate and complex Matching **Ans: d**	Page No-159 [IO-3] [SO-a]	L2
5	**Aprise forward chaining with your answers** **i) A system that is directed by goal** **ii) A system that is driven by data** **iii) Rule application and matching are more complicated** **iv) Apply diagnostic cases for matching**	Page No-159 [IO-3] [SO-b]	L2

a) Statement (i),(ii),(iii) are correct

b) Statement (ii),(iii), are correct

c) Statement (i),(ii),(iv) are correct

d) Statement (i),(iv) are correct

Ans:b

6	**Imagine an electrical circuit consisting of a simple stove with two hot- plates wired in parallel and a control light, which is on if at least one of the plates is on operation. Each plate has a fuse, and it is known that one of them cannot stand much current and will melt if the current gets high, but it is not known which one.**	Page No-165 [IO-3] [SO-b]	L3

Consider the following program P:

a) melted-fuse, V melted-fuse, +- high-current

b) light-off + melted-fuse, A melted-fuse

c) , light_off+ power-failure

d) light-off + broken-bulb

e) burns-plate, + ~melted_fise, A Tpower-failure

f) burrns-plate;! + Tmelted_fuse, A Tpower-failure

The first rule states that on high current, a fuse will melt. The second through fourth rule describe situations under which the control light is off, namely, if both fuses are melted, if the power fails, and if the bulb is broken. The last two rules state that a hot plate burns if there is no power failure and the fuse is not melted.

Now answer which is your Abduction theory

Ans;d

7	**Andrew believes that the earth is flat. We can encode the**	Page No-163 [IO-3] [SO-a]	L3

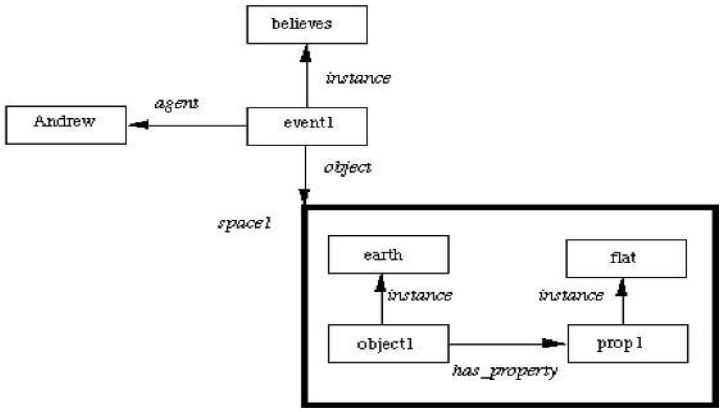
proposition the earth is flat in a space and within it have nodes and arcs the represent the fact. Its represented in the diagram.

Find which sematic network the Diagram comes under

a) Partitioned network

b) Inheritance sematic network

c) Inference Sematic network



Ans:a

8 **The People arrive at conclusions only tentatively; based on partial or incomplete information, reserve the right to retract those conclusions while they learn new facts. Such reasoning non-monotonic, precisely because the set of accepted conclusions have become smaller when the set of premises expanded**

Page No-166 [IO-3] [SO-b] L2

This Justification is respect to which type of reasoning

a) Symbolic reasoning

b) Statistical reasoning

c) Fuzzy logic reasoning

d) Logical reasoning

Ans: b

9 **First-order Predicate logic (FOPL) provides**

- Constants: a, b, dog33. Name a specific object.
- Variables: X, Y. Refer to an object without naming

Page No-147 [IO-3] [SO-b] L2

it.

- Functions: Mapping from objects to objects.
- Terms: Refer to objects
- Atomic Sentences: in(dad-of(X), food6) Can be true or false, Correspond to propositional symbols P, Q.

A well-formed formula

a) (∀x)P(x, y)

b) (∀x)P(x)

c) (∃ x)P(x)

d) (∀x) → P(x)

Ans:b

10	**'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 ____**	Page No-144 [IO-3] [SO-b]	L2

a) True, true

b) True, false

c) False, true

d) False, false

Ans:a

12 MARK MCQ

1	**What among the following could the universal instantiation of _____**	Page No-145 [IO-3] [SO-a]	L2

For all x Dictators (x) ^ Greedy(x) => Evil(x)

i) Dictators (Rasputin) ^ Greedy(Rasputin) => Evil(Rasputin)

ii) Dictators (y) ^ Greedy(y) => Evil(y)

iii) Dictators (Donald) ^ Greedy(Donald) => Evil(Donald)

a) Statement (i),(ii),(iii) are correct

b) Statement (ii),(iii), are correct

c) Statement (i),(ii),(iv) are correct

d) Statement (i)is correct

Ans:a

∀x ∃(y)[P (x, y, z)] in this statement which is an free bound variable

a)x,y

b)x,z

c)y

d)z

Ans:c

2	**Translate the following statement into FOL.** **"For every a, if a is a PhD student, then a has a master degree"**	Page No-149 [IO-3] [SO-b]	L3

i) ∀ a PhD(a) -> Master(a)

ii) ∃ a PhD(a) -> Master(a)

iii) A is true, B is true

iv) A is false, B is false

a) Statement (i),(ii),(iii) are correct

b) Statement (ii),(iii),(iv) are correct

c) Statement(ii) is correct

d) Statement (i)is correct

Ans:d

3

$\neg W_{11}$	$\neg S_{11}$	$\neg P_{11}$	$\neg B_{11}$	$\neg G_{11}$	V_{11}	OK_{11}
$\neg W_{12}$	----	$\neg P_{12}$	-----	----	$\neg V_{12}$	OK_{12}
$\neg W_{21}$	$\neg S_{21}$	$\neg P_{21}$	B_{21}	$\neg G_{21}$	V_{21}	OK_{21}

Page No-141 [IO-3] [SO-b] L3

Here in the first row, we have mentioned propositional variables for room[1,1], which is showing that room does not have wumpus($\neg W_{11}$), no stench ($\neg \mathbf{S_{11}}$), no Pit($\neg \mathbf{P_{11}}$), no breeze($\neg \mathbf{B_{11}}$), no gold ($\neg \mathbf{G_{11}}$), visited ($\mathbf{V_{11}}$), and the room is Safe($\mathbf{OK_{11}}$).

In the second row, we have mentioned propositional variables for room [1,2], which is showing that there is no wumpus, stench and breeze are unknown as an agent has not visited room [1,2], no Pit, not visited yet, and the room is safe.

In the third row we have mentioned propositional variable for room[2,1], which is showing that there is no wumpus($\neg$ W21), no stench ($\neg \mathbf{S_{21}}$), no Pit ($\neg \mathbf{P_{21}}$), Perceives breeze($\mathbf{B_{21}}$), no glitter($\neg \mathbf{G_{21}}$), visited ($\mathbf{V_{21}}$), and room is safe ($\mathbf{OK_{21}}$).

Prove that Wumpus is in the room (1, 3)

Apply Modus Ponens with ¬S11 and R1,Apply MP to S_{12} and R4

i) $\neg W_{11} \wedge \neg W_{12} \wedge \neg W_{21,}$

ii) $W_{13} \vee W_{12} \vee W_{22} \vee . W_{11}$

iii) $W_{13} \vee W_{12} \vee W_{22}$

iv) $W_{13} \vee W_{12}$ and $\neg W_{12}$

a) Statement (i),(ii),(iii) are correct

b) Statement (ii),(iii), are correct

c) Statement (i),(ii),(iv) are correct

d) Statement (i),(ii) are correct

Ans:d

4 **Find the MGU of Q(a, g(x, a), f(y)), Q(a, g(f(b), a), x)}** Page No-145 L3

Here, Ψ_1 = Q(a, g(x, a), f(y)), and Ψ_2 = Q(a, g(f(b), a), x) [IO-3] [SO-b]
S_0 => {Q(a, g(x, a), f(y)); Q(a, g(f(b), a), x)}
SUBST θ= {f(b)/x}
S_1 => {Q(a, g(f(b), a), f(y)); Q(a, g(f(b), a), f(b))}

SUBST θ= {b/y}
S_1 => {Q(a, g(f(b), a), f(b)); Q(a, g(f(b), a), f(b))}

a) [a/b, f(a)/x, a/y]

b) [a/b, f(b)/x, b/y]

c) [a/a, f(b)/x, b/y]

d) [a/a, f(ba/x, a/y]

Ans:c

5 **What is the probability that a patient has diseases meningitis with a stiff neck?** Page No-158 [IO-3] [SO-b] L3

Given Data:

A doctor is aware that disease meningitis causes a patient to have a stiff neck, and it occurs 80% of the time. He is also aware of some more facts, which are given as follows:

- The Known probability that a patient has meningitis disease is 1/30,000.
- The Known probability that a patient has a stiff neck is 2%.

Let a be the proposition that patient has stiff neck and b be the proposition that patient has meningitis. , so we can calculate the following as:

P(a|b) = 0.8

P(b) = 1/30000

P(a)= .02

a)0.00013333

b)0.1113333

c)0.001333

d)0.013333

Ans:c

6 ***Marcus was a man,Marcus was a Pompeian, All Pompeians were Romans, Caesar was a ruler*** Page No-150 [IO-3] [SO-b] L3

Convert natural language to predictive logic given

i)All Romans were either loyal to Caesar or hated him

ii) Everyone is loyal to someone

a) □x [Roman(x) □ (LoyalTo(y,Caesar) □ Hate(x,Caesar))], □x □y LoyalTo(x,y)

b) □x [Roman(y) □ (LoyalTo(x,Caesar) □ Hate(y,Caesar))], □x □y LoyalTo(x)

c) □x [Roman(x) □ (LoyalTo(x,Caesar) □ Hate(x,Caesar))], □x □y LoyalTo(x,y)

d) □x [Roman(y) □ (LoyalTo(x,Caesar) □ Hate(x,Caesar))], □x □y LoyalTo(x,y)

Ans:d

iii) ***People only try to assassinate rulers they aren't loyal to***

a) □x□y[(Person(x,y) □ Ruler(y) □ TryAssassinate(x,y)) □¬LoyalTo(x,y)]

b)) □x□y[(Person(x) □ Ruler(y) □ TryAssassinate(x,y)) □¬LoyalTo(x,y)]

c)) □x□y[(Person(y) □ Ruler(x) □ TryAssassinate(x,y)) □¬LoyalTo(x,y)]

e)) □x□y[(Person(x) □ Ruler(y) □ TryAssassinate(x,y)) □¬LoyalTo(x)]

Ans:b

UNIT-4

PLANNING

ONE MARK MCQ

1	The following is not a part of artificial intelligence.		Page No-200 [IO-4] [SO-a]	L1
	a) Domain model	**b) Recovery model**		
	c) Initial state	d) Goal state(Next state)		

Answer: **b)Recovery model**

2	Representation of planning problem is mapping of	Page No-201 [IO-4] [SO-a]	L1

a) states,actions and goals b) States, constraints and goals
c) Constraints, goals & actions d) Constraints , actions & states

Answer: **a) States ,actions and goals**

3	The representation assumes that the conditions that we do not specify explicitly are not accounted or rather are not considered to be true. The concept is called	Page No-202 [IO-4] [SO-a]	L1

a) Open world Assumption b) Open World Decision
c) Closed World Assumption d) Closed World Decision

Answer: **c) Closed World Assumption**

4	Which of the following language overcomes the limitations of STRIPS language?	Page No-205 [IO-4] [SO-b]	L1

a) State Description **b) Action Description Language**
c) Planning Domain Language d) Planning Domain Description Language

Answer: **b) Action Description Language**

5	The block world is an example that is used to demonstrate the planning using	Page No-206 [IO-4] [SO-a]	L1

a) **STRIPS** b) PDDL
c) ADL d) APDL

Answer: **a) STRIPS**

6	A Forward state space search is also called as	Page No-211 [IO-4] [SO-a]	L1

a) In-Out space search b)Out-In space search
b) **Progression planning** d) Regression planning

Answer: **c)Progression planning**

7	Which of the following strategy says " Do not make any decision unless required"?	Page No-213 [IO-4] [SO-b]	L2

a)partial commitment strategy **b)Least commitment strategy**
c)High commitment strategy d) Consistent commitment strategy

Answer: **b) Least commitment strategy**

8	Which of the following is not true regarding mutex and mutex links ?	Page No-220 [IO-4] [SO-b]	L1

a) Dotted arcs in the states of planning graphs are called mutex links.
b) They cannot be selected together or else there would be a conflict. The pair in conflict is called mutex.
c) The mutex cannot exist for literals as well as actions.
d) Two actions at the same layer are mutex if they have inconsistent effects and interference.

Answer: **c) The mutex cannot exist for literals as well as actions**.

9	Which of the following is false ?	Page No-223 [IO-4] [SO-a]	L2

a) Reactive planning is planning under uncertainty
b) Condition planning can occur only in fully observable.
c) In linear planning the effects change according to the situations in which they are operated.
d) The multi agent planning involves use of multiple agents to carry out the planning tasks.

Answer: **c)In linear planning the effects change according to the situations in which they are operated.**

10	Discuss about the process of checking the current state of its percepts and ensuring that the things are moving ahead as per the plan is named as what.	Page No-225 [IO-4] [SO-c]	L1

a) Knowledge based planning **b)Execution planning**
c) Reactive planning d)Pro active planning

Answer: **b)Execution planning**

11	Identify the level of linguistic processing deals with the analysis of structure and meaning of sentence making connection between words and sentences.	Page No-299 [IO-4] [SO-a]	L1

a) Lexical b)Syntactic
b) Semantic **d)Disclosure**

Answer: **d) Disclosure**

12 Guess the level of processing in NLP also referred as Parsing — Page No-292 [IO-3] [SO-b] — L1

a) **Syntactic** b) semantic
b) Disclosure d) Lexical

Answer: **a) Syntactic**

13 Which processing step of NLP has the drawback of producing root words which does not have any meaning ? — Page No-289 [IO-3] [SO-b] — L1

a) Sentence segmentation **b) Stemming**
b) Word tokenization d) Lemmatization

Answer: **b)Stemming**

14 Analyse in Temporal logic, planning is based on what? — Page No-225 [IO-4] [SO-a] — L1

a) **Time** b)Rule
c)Semantic d) Syntax

Answer: **a) Time**

15 Predict the measures which will be the proportion of retrieval documents that are actually relevant — Page No-310 [IO-4] [SO-a] — L1

a) Indexing **b) Precision**
b) Recall d) Semantic analysis

Answer: **b) Precision**

16 What is Morphological Segmentation ? — Page No-280 [IO-3] [SO-a] — L1

a) Does Discourse Analysis b) Is an extension of propositional logic
c) Separate words into individual morphemes and identify the class of the morphemes d) None of the above

Answer: **c) Separate words into individual morphemes and identify the class of the morphemes**

17 Guess what will be the one in Non linear planning ? — Page No-230 [IO-4] [SO-a] — L1

a) Parallel action executions can occur
b) Partial execution of an action occurs
c) Only one action can occur and that too sequentially

Answer:c) Only one action can occur and that too sequentially

18 Which of the following checks the correctness of the sentence grammatically ? — Page No-311 [IO-4] [SO-b] — L1

a) Indexing
b) **ATN**
b) RTN
d) Wrappers

Answer: **b) ATN**

19 A plan that consists of sub problems which are solved simultaneously is called as the one in the below — Page No-222 [IO-4] [SO-a] — L1

a) Non linear problem
b) Linear problem
b) Structured problem
d) Unstructured problem

Answer:d) Unstructured problem

20 Determine which is an approach in STRIPS that maintains the stacks of goals to achieve the tasks — Page No-229 [IO-4] [SO-a] — L1

a) Total order planning
b) Goal stack planning
b) Means-ends analysis
d) Partial order planning

Answer: **b) Means-ends analysis**

FOUR MARK MCQ

1 With respect to Goal state planning, Identify the statements which are relevant — Page No-208 [IO-4] [SO-b] — L2

(i) The problem solver makes use of single stack that contains both goals and operators

(ii) The problem solver relies on a database that describes current situation and a set of operators describes as PRECONDITION,ADD and DELETE lists

(iii) This method solves two or more goals at a time .

(iv) If any component of a particular goal not satisfied,then those

unsolved parts are reinserted into the stack.

a) Statement (i),(ii),(iii) are correct

b) Statement (ii),(iii),(iv) are correct

c) Statement (i),(iii),(iv) are correct

d) Statement (i),(ii),(iv) are correct

Answer: d) Statement (i),(ii),(iv) are correct

2	Mean end analysis, the problem solving technique in AI is found applicable	Page No-210 [IO-4] [SO-b]	L1

(i) In business transformation projects, defining the state and listing new business process to be developed

(ii) In calculating the best route to travel from one ssource to another destination

(iii) Comparing two different structures and find out the difference between them

a) Statement (i) & (ii) are correct

b) Statement (i) & (iii) are correct

c) Statement (ii) & (iii) are correct

d) Statement (i),(ii),& (iii) are correct

Answer: **a) Statement (i) & (ii) are correct**

3	Which of the following statements are true regarding partial order planning ?	Page No-213 [IO-4] [SO-b]	L2

(i) A partial ordering is both transitive and symmetric in nature

(ii) A partial order plan is a set of actions together with a partial ordering representing a before relation on actions will solve the goal from initial state.

(iii)A partial order plan will not specify which action will come out first when two actions are processed.

(iv) A partial order planner builds up a plan as a step of steps with some temporal constraints.

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) Statement (ii),(iii),(iv) are correct

d) Statement (i),(ii),(iv) are correct

Answer: **b) Statement (i),(iii),(iv) are correct**

4	Which of the following are true regarding planning graphs ? (i) They are efficient way to create representation of planning problem to achieve better heuristic estimates. (ii) They work only for propositional problems. (iii) Each level of the graphs contains literals which are true at the time step depending on the actions (iv) The extract solution of a graph plan algorithm follows forward approach identifying the possible plan strategies moving forward. **a) Statement (i),(ii),(iii) are correct** b) Statement (i),(iii),(iv) are correct c) Statement (ii),(iii),(iv) are correct d) Statement (i),(ii),(iii) (iv)are correct Answer:**a) Statement (i),(ii),(iii) are correct**	Page No-218 [IO-4] [SO-a]	L1
5	Constrained posting of Non linear planning will (i) Incrementally hypothesize operators (ii) Make partial orderings between operators (iii) Store the plan in a series of state transitions (iv) Binding of variables within operators.	Page No-222 [IO-4] [SO-b]	L1

a) Statement (i),(ii),(iii) are correct

b) Statement (ii),(iii),(iv) are correct

c) Statement (i),(ii),(iv) are correct

d) Statement (ii),(iii),(iv) are correct

Answer: **c) Statement (i),(ii),(iv) are correct**

6 What are the major advantages in going for a reactive planning ? Page No-224 [IO-4] [SO-b] L1

(i) They operate robustly in domains that are difficult to model completely and accurately.

(ii) Reactive systems perform actions based directly on their perceptions of the world.

(iii) It is easier to make major change or identify problems which currently does not exist.

(iv) Reactive systems are extremely responsive since they avoid the combinatorial explosion involved in deliberate planning

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(ii),(iv) are correct

c) Statement (ii),(iii),(iv) are correct

d) Statement (i),(iii),(iv) are correct

Answer:**b) Statement (i),(ii),(iv) are correct**

7 Factors which affect the Job shop scheduling (jss) problem are Page No-227 [IO-4] [SO-b] L1

(i) Arrival pattern

(ii) Number of machines

(iii) Work sequence

(iv) Type of job

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(ii),(iv) are correct

c) Statement (i),(iii),(iv) are correct

d) Statement (ii),(iii),(iv) are correct

Answer:**a) Statement (i),(ii),(iii) are correct**

8	Which levels of NLP deals with the meaning of words and structure of different kinds of texts respectively ? (i) Lexical level (ii) Semantic level (iii) Discourse level (iv) Pragmatic level a) Statement (i) &,(iii) are correct **b) Statement (ii) & (iii) are correct** c) Statement (iii) & (iv) are correct d) Statement (i) & (iv) are correct Answer:**b) Statement (ii) & (iii) are correct**	Page No-292 [IO-3] [SO-b]	L1
9	Grammars and parsers in NLP possess the following characteristics (i) The most common way to represent grammar is a set of production rules (ii) Symbols that are further expanded by rules are called terminal symbols (iii) Every node of the parse tree corresponds to either an input word or to a non terminal in our grammar. (iv) Symbols that correspond directly to strings that must be found in a single sentence are called non terminal symbols	Page No-289 [IO-3] [SO-b]	L2

a) Statement (i) & (iv) are correct

b) Statement (ii),(iii),(iv) are correct

c) Statement (i) & (iii) are correct

d) Statement (i),(ii),(iii) are correct

Answer:c**) Statement (i) & (iii) are correct**

10	Give the functions of Information retrieval system (i) To identify the information relevant to the areas of the target users community (ii) To check the syntax and semantic errors in the document (iii) To analyze the contents of the documents (iv) To match the search statement with the stored database	Page No-301 [IO-3] [SO-b]	L1

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(iii),(iv) are correct

c) Statement (ii),(iii),(iv) are correct

d) Statement (i),(ii),(iv) are correct

Answer:**b) Statement (i),(iii),(iv) are correct**

12 MARK MCQ

(Each sub division carrying 4 marks)

1 **Consider Planning and planning agents** Page No-208 [IO-4] [SO-a] L2

(I) Choose the best rule to apply next based on the best available heuristic information

(v) As a planning system is searching for a sequence of operators to solve a particular problem, it must be able to detect when it is exploring a path that can never lead to a solution

(vi) If the search process is reasoning backward from the initial state, It can prune any path that leads to a state from which goal state cannot read

(vii) If a search process reasoning backward from the goal state , it can also terminate a path because it is sure that initial state cannot reach

(viii) The same reasoning mechanism that can use to detect a solution can often use for detecting a dead end

a) Statement (i),(ii),(iii) are correct

b) Statement (ii),(iii),(iv) are correct

c) Statement (i),(iii),(iv) are correct

d) Statement (i),(ii),(iv) are correct

Ans: b) Statement (ii),(iii),(iv) are correct

(II) Simple planning agent works under the following assumptions

(v) Each action is indivisible

(vi) No concurrent action is allowed

(vii) Agent has less knowledge on its environment

(viii) Result of each action is completely determined and there is no uncertainty

a) Statement (i),(ii),(iii) are correct

b) Statement (i),(ii),(iv) are correct

c) Statement (i),(iii),(iv) are correct

d) Statement (i),(ii),(iii) & (iv) are correct

Ans: a) Statement (i),(ii),(iii) are correct

(III) With respect to Goal stack planning,

If Initial state

ON(B,A)^ONT(C)^CL(D)

Goal state

ON(C,A)^ON(B,D)

The final plan for the given problem is

(a)Unstack(B,A),Stack(B,D),Pickup(c), Stack(C,A)

(b)Stack (C,D) Pickup (B), Stack (B,A), Stack (C,B)

(c)Unstack(C,D), Stack(C,A), Pickup (B), Stack (B,A)

(d) Stack (B,C) Pickup(A), Stack (A,B) ,Stack (C,D)

Ans : (a)Unstack(B,A),Stack(B,D),Pickup(c), Stack(C,A)

2 **Planning graph, Conditional & Partial order planning** Page No-213 [IO-4] [SO-b] L1

(I) Each level of planning graph consists of

a) Only literals

b) Literals & actions

c) Variables

d) Events and Actions

Ans: b) Literals & actions

(II)Conditional planning

(v) Bounded On determinacy can have predictable effects but the possible effects cannot be determined

(vi) Vaccum cleaner is an example for conditional planning under partially observable environment

a) Statement (i) is true but statement (ii) is false

b) Statement (i) is false but statement (ii) is true

c) Both statements are true

d) Both statements are false

Ans: b) Statement (i) is false but statement (ii) is true

III) Partial order planning (pop) involves

(v) Searching over the space for possible plans

(vi) Searching over possible situation

(vii) Searching the whole problem at once

a) Statement (i) alone correct

b) Statements (i) & (ii) are correct

c) Statements (i) & (iii) are correct

d) All statements are incorrect

Ans: a) Statement (i) alone correct

3 **Job shop scheduling problems** Page No-227 L3 [IO-4] [SO-b]

I .Four jobs were queued at a work station with listed profiles. Using the firstcome first serve priority sequencing rule determine the average flow time for the current group of jobs.

JOB	PROCESSING TIME	TIME TO DUE DATE	NO OPNS REMAINING	SHOP TIME REMAINING
1	8.9	18	5	17.3
2	5.4	10	2	7.7

3	2.7	20	3	15.5
4	12.3	8	4	9.5

Hint : Arrival sequence is maintained

(a) 21.475 **(b) 17.375** (c) 14.275 (d) 21.675

Ans : (b) 17.375

(II). Four jobs were queued at a workstation with the listed profiles. Using the critical-ratio-priority sequencing rule, determine the average past-due time for the current workstation

JOB	PROCESSING TIME	TIME TO DUE DATE	NO OPNS REMAINING	SHOP TIME REMAINING
1	8.9	18	5	17.3
2	5.4	10	2	7.7
3	2.7	20	3	15.5
4	12.3	8	4	9.5

Hint : Calculate the critical ratio then sequence jobs

(a) 7.475 (b) 6.400 (c) 5.325 **(d) 8.4**

Ans : (d) 8.4

(III) All jobs shown in the table must be processed first on Machine 1 and then on Machine 2 before they are completed. What is the minimum makespan for these jobs?

Job Number	Machine 1	Machine 2
1	5	8
2	4	3
3	9	12
4	6	4
5	8	5
6	10	7
7	3	9
8	1	11

(a) **60** (b) 83 (c) 105 (d) 46

Ans : a)60

4 **(I) Consider IR MODELS** Page No-292 L1 [IO-3] [SO-b]

(v) Boolean , Vector and probabilistic are the three non-classical IR models

(vi) Cluster model is an example of Alternate IR models

(vii) Inverted index is the primary data structure of IR system

(viii) Stemming, the simplified form of morphological analysis is one of the design feature of IR models

a) Statement (ii),(iii) are correct

b) Statement (ii) ,(iii),(iv) are correct

c) Statement (i),(iii) ,(iv)are correct

d) All above statements are correct

Ans: b) Statement (ii) ,(iii),(iv) are correct

(II) Syntax and Semantic analysis

(v) Creating Symbol table and to produce intermediate representations are some of the major roles of a parser

(vi) A grammar can be informally wriiten as 4 tuple (N,T,A,P)

Where N – Set of Non terminals

T – Set of terminals

A – Set of Axioms

P – Production rules

(vii) Entities, Relations and predicates are the building blocks of semantic system

(viii) The difference between polysemy and homonymy lies in the

relationship between the meaning of words.

a) Statement (i) & (iii) are correct

b) Statement (ii),(iii),(iv) are correct

c) Statement (i),(iii),(iv) are correct

d) Statement (ii) & (iv) are correct

Ans: c) Statement (i),(iii),(iv) are correct

(III) Analyzing a sentence whose meaning depends on the preceding sentence is

(v) Morphological analysis

(vi) Syntax and semantic analysis

(vii) Discourse Integration

(viii) Pragmatic analysis

Ans:(iii) Discourse Integration

5 **When solving AI problems** Page No-221 [IO-4] [SO-b] L1

(II) Find out the order in which the sequence of steps are executed

(v) Gathering Knowledge

(vi) Defining problem

(vii) Applying solution

(viii) Planning

(ix) Forming the state space

a) (i)(v)(ii)(iv)(iii)

b) (i) (ii) (iii) (iv) (v)

c) (ii) (i) (v) (iv) (iii)

d) (ii) (i) (v) (iii) (iv)

Ans: c) (ii) (i) (v) (iv) (iii)

(II) Incorrect information results in unsatisfied preconditions for actions and plans_____ detects violations of the properties for successful completion of the plan

(v) Conditional plan

(vi) Conformant planning

(vii) Execution monitoring

(viii) Partial order planning

a) only (i)

b) only (iii)

c) both (i) and (ii)

d) both (i) and (iv)

Ans: b)only (iii)

(III) With respect to Hierarchical Network planning

(v) Primitive tasks, compound tasks and goal tasks are the three set of tasks provided by hierarchical task network approach

(vi) Supervised condition in a HTN planner may be satisfied either by an intentional insertion of a relevant effect earlier in the task network or by an explicit introduction of a primitive task that will achieve the desired effect

(vii) Plan based HTN planners make use of consistent commitment strategy

a) Statement (i) only true

b) Statement (i) and (ii) are true

c) Statement (i) and (iii) are true

d) All the above statements are true

Ans: b) Statement (i) and (ii) are true

6 **Applications Of Natural Language Processing** Page No-309 L2 [IO-3] [SO-b]

(II)Sentimental analysis

(v) Uses Rule based algorithms of NLP

(vi)Naïve Bayes algorithms used to predict some value (y) Given a set of features (x)

(vii) Deep learning is a diverse set of algorithms that mimic the brain by employing neural network.

a) Statement (i) & (ii) are correct

b) Statement (i),(iii) are correct

c) Statement (ii) & (iii) are correct

d) Statement (i),(ii),(iii) are correct

Ans: b) Statement (i),(iii) are correct

(II) Which among the following is not an application of NLP ?

a) **Market based analysis**

b) Sentimental analysis

c) Speech recognition

d) Machine translation

Ans: a)Market based analysis

(III) Machine translation

(i) In the transfer approach of Machine translation source language are

converted into abstract oriented representations

(ii) Analogy based, example based translation techniques use Machine translation approach

(viii) Direct MT approach capable of translating target language back to source language. These systems are unidirectional in nature.

(a) (i) only true

(b) (i) and (iii) are true

(c) (i) and (ii) are true

(d) None of the above statements are true

Ans : c)(i) and (ii) are true

UNIT-V

ONE MARK MCQ

1 Which Agent involves in general games ? Page No- 353 L1 [IO-3][SO-a]

a) Single- agent b) Multi- agent c) Neither Single- agent nor Multi- agent
d) Only Single- agent and Multi- agent

Answer:d) Only Single- agent and Multi- agent

2	General algorithm applied on game tree on decision of success/failure is infered on a) DFS/BFS Search Algorithms b) Heuristic Search Algorithms c) Greedy Search Algorithms d) MIN/MAX Algorithms **Answer:**d) MIN/MAX Algorithms	Page No- 354 [IO-3][SO-a]	L1
3	How many number of player involved in Zero sum game. a) Single player b) Two player c) Multiplayer d) Three player **Answer: c**) Multiplayer	Page No-358 [IO-3][SO-b]	L2
4	A game can be defined as a of search problem with the following components. a) Initial State b) Successor Function c) Terminal Test d) All of the mentioned **Answer:**d)All of the mentioned	Page No-365 [IO-3][SO-a]	L1
5	Which Will define the initial state and the legal moves for each side for the game. a) Search Tree b) Game Tree c) State Space Search d) Forest **Answer:**b) Game Tree	Page No-367 [IO-4][SO-a]	L1
6	Identify the effectiveness of the alpha beta pruning is increases will depends on ? a) Nodes b) Order in which they are executed c) All of the mentioned d) None of the mentioned **Answer: a**) Nodes	Page No-363 [IO-3][SO-a]	L2
7	Which search method incur less memory? a) Depth-First Search b)Breadth-First search	Page No-362 [IO-4][SO-a]	L1

c) Both (a) and (b) d) Linear Search.

Answer:a) Depth-First Search

8	Which is the best way to opt for Game playing problem? a)Linear approach b) Heuristic approach c) Random approach d) Stratified approach.	Page No- 367 [IO-3][SO-a].	L1

Answer:b) Heuristic approach

9	Which values are independent in minimax search algorithm? a) Pruned leaves x and y b) Every states are dependant c) Root is independent d) Root is dependent	Page No-268 [IO-4][SO-a]	L1

Answer:a) Pruned leaves x and y

10	Find the states till Alpha-beta pruning can be applied ? a) 10 states b) 8 States c) 6 States d) Any depth	Page No-364 [IO-3][SO-a]	L1

Answer:d) Any depth

11	The _____ value is assigned to alpha and beta in the alpha-beta pruning? a) Alpha = max b) Beta = min c) Beta = max d) Both Alpha = max & Beta = min	Page No- 365 [IO-4][SO-a]	L1

Answer: d) Both Alpha = max & Beta = min

12	Judge about what search is similar to Minimax search . a) Hill-climbing search b) Depth-first search c) Breadth-first search d) Linear Search	Page No-363 [IO-3][SO-a]	L2

Answer:b) Depth-first search

13	What is called as transposition table? a) Hash table of next seen positions b) Hash table of previously seen positions c) Next value in the search d) Hash table current position	Page No-369 [IO-4][SO-a]	L1

Answer:b) Hash table of previously seen positions

14	By using what the feasibility of whole game tree is calculated? a) Evaluation function b) Transposition	Page No-368 [IO-4][SO-a]	L3

c) Alpha-beta pruning d) Fuzzy logic

Answer: a) Evaluation function

15	Discuss about The Set of actions for a problem in a state space is defined by which state . a) Intermediate states b) Initial state c) Successor function, which takes current action and returns next immediate state d) Goal states **Answer:**c) Successor function, which takes current action and returns next immediate state	Page No-277 [IO-4][SO-a]	L2
16	Removing detail of a process from a given state representation is called _____ a) Extraction b) Abstraction c) Information Retrieval d) Mining of data **Answer:** b) Abstraction	Page No-279 [IO-4][SO-b]	L2
17	The problem which aim is to find the shortest tour in which each city must be visited exactly once. . a) Finding shortest path between a source and a destination b) Travelling Salesman problem c) Map coloring problem d) Depth first search traversal on a given map represented as a graph **Answer:**b) Travelling Salesman problem	Page No-280 [IO-3][SO-b]	L2
18	What are taken into account of state-space search? a) Post conditions b) Preconditions c) Effects d) Both Preconditions & Effects **Answer:**d) Both Preconditions & Effects	Page No-276 [IO-4][SO-a]	L2
19	How many states are available in state-space search? a) 1 b) 2 c) 3 d) 4 **Answer:**d) 4	Page No-278 [IO-3][SO-a]	L1
20	What will happen if initial state of the planning problem is satisfied with the predecessor description generated? . a) Success b) Error c) Compilation d) Termination **Answer:** d) Termination	Page No-268 [IO-3][SO-a]	L1

21	Which values are in-dependant in minimax search algorithm?	Page No-364 [IO-3][SO-a]	L3

a) Pruned leaves x and y b) Every states are dependant
c) Root is in-dependant d) Root is dependent

Answer:a) Pruned leaves x and y

22	Mathematical game theory, a branch of economics, views any multi-agent environment as a game provided that the impact of each agent on the others is "significant," regardless of whether the agents are cooperative or competitive.	Page No-368 [IO-4][SO-a]	L2

a) True
b) False

Answer:a) True

23	Identify regarding LISP, the function returns t if <integer> is even and nil otherwise what?	Page No-276 [IO-3][SO-a]	L2

a) (evenp <integer>) b) (even <integer>)
c) (numeven <integer>) d) (numnevenp <integer>)

Answer:a) (evenp <integer>)

24	What is Hyponymy relation?	Page No-369 [IO-4][SO-a]	L1

a) A is part of B b) B has A as a part of itself
c) A is subordinate of B d) A is superordinate of B

Answer: c) A is subordinate of B

25	Determine about the Fuzzy logic is usually represented as	Page No-280 [IO-3][SO-a]	L1

a) IF-THEN-ELSE rules b) IF-THEN rules
c) Both IF-THEN-ELSE rules & IF-THEN rules d) IF-ELSE rules

Answer:b) IF-THEN rules

FOUR MARK MCQ

1	Consider a 3 game tournament between two teams. Assume that every game results in either a win or loss. The team that wins two or more games wins the series. The probability for wining the first game for both teams is 1/2. The probability for a team to win a game after a win is 2/3. The probability of wining a game after a loss is 1/3. Note that the effect of only previous game is considered. What is the probability for a team to win the series after loosing first game. . a) 1/9 b) 1/6 c) 2/9 d) 1/3 **Answer:** c) 2/9	Page No-365 [IO-3][SO-a]	L2
2	How many minimum states are required in a DFA to find whether a given binary string has odd number of 0's or not, there can be any number of 1's. a) 1 b) 2 c) 3 d) 4 **Answer:** b) 2	Page No-362 [IO-3][SO-a].	L3
3	Analyse about the 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) All of the mentioned **Answer:** c) Current symptoms plus some knowledge from the textbooks plus experience	Page No-276 [IO-3][SO-a]	L2
4	A) Knowledge base (KB) is consists of set of statements. B) Inference is deriving a new sentence from the KB.Choose the correct option. a) A is true, B is true b) A is false, B is false c) A is true, B is false d) A is false, B is true	Page No-358 [IO-3][SO-a].	L2

Answer: a) A is true, B is true

5	The time and space complexity of BFS is (For time and space complexity problems consider b as branching factor and d as depth of the search tree.)	Page No-365 [IO-3][SO-a].	L2

a) O(bd+1) and O(bd+1) b) O(b2) and O(d2)
c) O(d2) and O(b2) d) O(d2) and O(d2)

Answer:a) O(bd+1) and O(bd+1)

6	The traveling salesman problem involves n cities with paths connecting the cities. The time taken for traversing through all the cities, without knowing in advance the length of a minimum tour, is	Page No-277 [IO-3][SO-a].	L2

(a) O (n) (b) O (n2) (c) O (n!) (d) O(n/2)

Ans:(c) O (n!)

7	‘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 _____	Page No-363 [IO-3][SO-a].	L2

a) True, true b) True, false c) False, true d) False, false

Ans :a) True, true

8	In LISP, the function evaluates <object> and assigns this value to the unevaluated <sconst>.	Page No-365 [IO-3][SO-a].	L2

a) (constant <sconst> <object>)
b) (defconstant <sconst> <object>)
c) (eva <sconst> <object>)
d) (eva <object> <sconst>)

Ans:b) (defconstant <sconst> <object>)

9	How do you represent “All dogs have tails”.	Page No-367	L2

(a)x: dog(x)àhastail(x) (b)x: dog(x)àhastail(y) [IO-3][SO-a]

(c) x: dog(y)àhastail(x) (d) x: dog(x)àhasàtail(x)

(e) x: dog(x)àhasàtail(y)

Ans:(a)x: dog(x)àhastail(x)

10 The truth values of traditional set theory is _____ and that of fuzzy set is _____ Page No-277 [IO-3][SO-a]. L1

a) Either 0 or 1, between 0 & 1 b) Between 0 & 1, either 0 or 1

c) Between 0 & 1, between 0 & 1 or 1 d) Either 0 or 1, either 0

Ans:a) Either 0 or 1, between 0 & 1

12 MARK MCQ

1 **Show the working of the Minimax algorithm using Tic-Tac-Toe Game.** Page No-365 [IO-3][SO-b] L2

There are two players involved in a game:

- **MAX:** This player tries to get the highest possible score
- **MIN:** MIN tries to get the lowest possible score

The following approach is taken for a Tic-Tac-Toe game using the Minimax algorithm:

a) Min Max decision =3

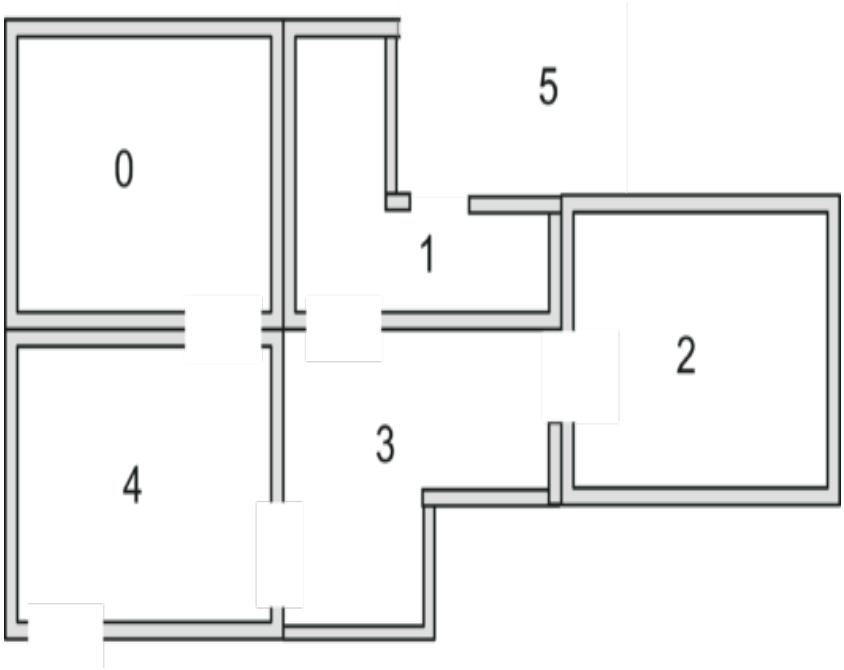
b) Min Max decision = 6

c) Min Max decision = 7

d) Min Max decision =10

Ans:a) Min Max decision =3

2	Which algorithm does Facebook use for face verification and how does it work? **a) Deep acquisition algorithm** **b) Deep learning algorithm** **c) Deep face algorithm** **d) Machine learning algorithm** **If it uses the above correct algorithm then what are all the process invoved in face recognition** **a)** Detect facial features and Align and compare the features b) Represent the key patterns by using 3D graphs Classify the images based on similarity c)Both a and B d)Only A **Ans:c) Deep face algorithm,**c)Both a and B	Page No-278 [IO-3][SO-b]	L2
3	Place an agent in any one of the rooms (0,1,2,3,4) and the goal is to reach outside the building (room 5). Can this be achieved through AI? If yes, explain how it can be done.	Page No-268 [IO-3][SO-b]	**L3**



In the above figure:

- 5 rooms in a building connected by doors
- Each room is numbered 0 through 4
- The outside of the building can be thought of as one big room (5)
- Doors 1 and 4 directly lead into the building from room 5 (outside)

a)Initial state = state 2

State 2 -> state 3

State 3 -> state (2, 1, 4)

State 4 -> state 5

b) Initial state = state 1

State 2 -> state 3

State 3 -> state (1, 2, 4)

State 4 -> state 5

c) Initial state = state 3

State 2 -> state 3

State 3 -> state (2, 1, 3)

State 4 -> state 5

d) Initial state = state 1

State 1 -> state 2

State 3 -> state (2, 1, 4)

State 4 -> state 5

Ans: a)Initial state = state 2

State 2 -> state 3

State 3 -> state (2, 1, 4)

State 4 -> state 5

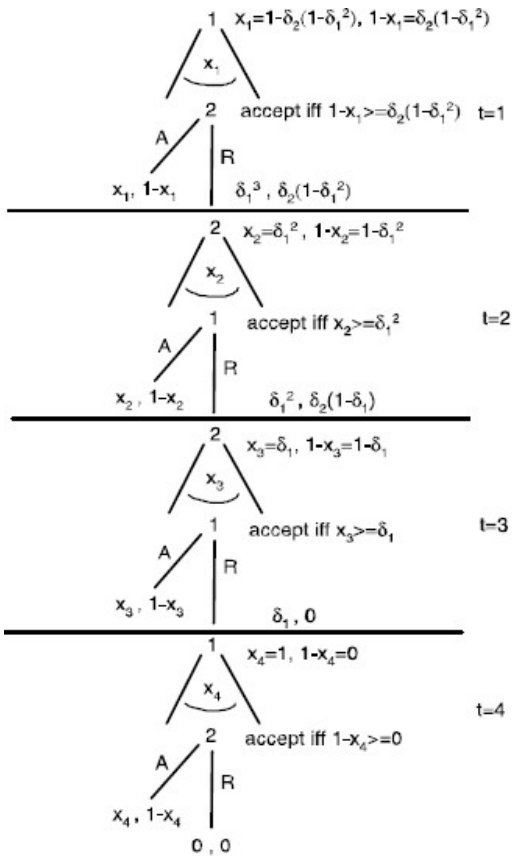
4 **The One Million Dollar Question Consider the following 4 stage bargaining game in which $1 million is to be split between players 1 and 2. Notice that player 1 makes the rst and last oers, while player 2 makes the second and third oers. Each player i has discount factor δi ∈ (0, 1):** Page No-365 [IO-3][SO-b] L2

a. [1 pt] Determine the subgame perfect equilibrium of this game.

b. [1 pt] Devise a Nash equilibrium in which the million is split in stage t = 3, with player 1 receiving 1/3 of the million and player 2 receiving 2/3 of the million. Be sure to specify all aspects of the equilibrium.

c. [1 pt] Explain why your answer to b is not sub game perfect.

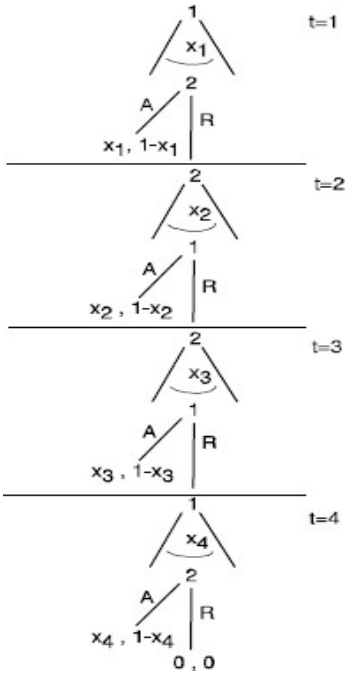
Hint: Your answer need not be a lengthy discourse on subgame perfection; focus on criticizing your answer to b.



Answer: a)[1 pt] Determine the subgame perfect equilibrium of

this game.

Using the strategies described in each node of the following game tree:



5 **For Tic-tac-toe, the rules, in the order of importance, are:** Page No-277 [IO-3][SO-b] L3

Rule 1: If the opponent has a winning move, block it.

Rule 2: If I have a winning move, take it.

Rule 3: Do not let the opponent creating a fork after my move. (Opponent may block your winning move and create a fork.)

Rule 4: If I can create a fork (two winning ways) after this move, do it.

Rule 5: Place in the position such as I may win in the most number of possible ways.

Which one is the correct order of the rules ?

a) 2,4,5,3,1

b) 1,2,3,4,5

c) 5,4,3,2,1

d) 2,1,4,3,5

Answer:2,1,4,3,5

6 **In two-player search tree to understand the working of Alpha-beta pruning** Page No-362 [IO-3][SO-b] L2

Step 1: At this step the, Max player will start first move from node A where α= -∞ and β= +∞, these value of alpha and beta passed down to node B where again α= -∞ and β= +∞, and Node B passes the same value to its child D.

Step 2: At Node D, the value of α will be calculated as its turn for Max. The value of α is compared with firstly 2 and then 3, and the max (2, 3) = 3 will be the value of α at node D and node value will also 3.

Step 3: Now algorithm backtrack to node B, where the value of β will change as this is a turn of Min, Now β= +∞, will compare with the available subsequent nodes value, i.e. min (∞, 3) = 3, hence at node B now α= -∞, and β= 3.

Step 4: At node E, Max will take its turn, and the value of alpha will change. The current value of alpha will be compared with 5, so max (-∞, 5) = 5, hence at node E α= 5 and β= 3, where α>=β, so the right successor of E will be pruned, and algorithm will not traverse it, and the value at node E will be 5.

Step 5: At next step, algorithm again backtrack the tree, from node B to node A. At node A, the value of alpha will be changed the maximum available value is 3 as max (-∞, 3)= 3, and β= +∞, these two values now passes to right successor of A which is Node C.At node C, α=3 and β= +∞, and the same values will be passed on to node F.

Step 6: At node F, again the value of α will be compared with left child which is 0, and max(3,0)= 3, and then compared with right child which is 1, and max(3,1)= 3 still α remains 3, but the node value of F will become 1.

Step 7: Node F returns the node value 1 to node C, at C α= 3 and β= +∞, here the value of beta will be changed, it will compare with 1 so min (∞, 1) = 1. Now at C, α=3 and β= 1, and again it

satisfies the condition α>=β, so the next child of C which is G will be pruned, and the algorithm will not compute the entire sub-tree G.

Step 8: C now returns the value of 1 to A here the best value for A is max (3, 1) = 3. Following is the final game tree which is the showing the nodes which are computed and nodes which has never computed. Hence the optimal value for the maximizer is 3 for this example. .

a)5,6,7,8,2,3,1,4

b) 3,2,1,4,8,7,6,5

c)4,5,6,2,1,3,4,7,8

D)1,2,3,4,5,6,7,8

Ans:D)1,2,3,4,5,6,7,8

1. In LISP, the function returns the list that results after the first element is removed (the rest f the list), is _____
a) car
b) last
c) cons
d) cdr
View Answer

Answer: d
Explanation: None.

2. LISP was created by?
a) John McCarthy
b) Marvin Minsky
c) Alan Turing
d) Allen Newell and Herbert Simon
View Answer

Answer: a
Explanation: None.

3. Which of the following contains the output segments of Artificial Intelligence programming?
a) Printed language and synthesized speech
b) Manipulation of physical object
c) Locomotion
d) All of the mentioned
View Answer

Answer: d
Explanation: None.

4An Artificial Intelligence system developed by Terry A. Winograd to permit an interactive dialogue about a domain he called blocks-world.
a) SHRDLU
b) SIMD
c) BACON
d) STUDENT
View Answer

Answer: a
Explanation: None

5.Strong Artificial Intelligence 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 mentioned
View Answer

Answer: a
Explanation: None

6.What is Artificial intelligence?
a) Putting your intelligence into Computer
b) Programming with your own intelligence
c) Making a Machine intelligent
d) Playing a Game
View Answer

Answer: c
Explanation: Because AI is to make things work automatically through machine without using human effort. Machine will give the result with just giving input from human. That means the system or machine will act as per the requirement.

7.A heuristic is a way of trying _____
a) To discover something or an idea embedded in a program
b) To search and measure how far a node in a search tree seems to be from a goal
c) To compare two nodes in a search tree to see if one is better than the other is
d) All of the mentioned
View Answer

Answer: d
Explanation: In a heuristic approach, we discover certain idea and use heuristic functions to search for a goal and predicates to compare nodes.

8.Which is not a property of representation of knowledge?
a) Representational Verification
b) Representational Adequacy
c) Inferential Adequacy
d) Inferential Efficiency
View Answer

Answer: a
Explanation: There is nothing to go for Representational verification; the verification comes under Representational adequacy.

9.What is state space?
a) The whole problem
b) Your Definition to a problem
c) Problem you design
d) Representing your problem with variable and parameter
View Answer

Answer: d
Explanation: Because state space is mostly concerned with a problem, when you try to solve a problem, we have to design a mathematical structure to the problem, which can only be through variables and parameters. eg. You have given a 4-gallon jug and another 3-gallon jug. Neither has measuring marker on it. You have to fill the jugs with water. How can you get exactly 2 gallons of water in to 4 gallons. Here the state space can defined as set of ordered pairs integers(x,y), such that x=0,1,2,3 or 4 and y=0,1,2 or 3; X represents the number of gallons in 4 gallon jug and y represents the quantity of water in the 3-gallon jug.

10.The process of removing detail from a given state representation is called _____
a) Extraction
b) Abstraction
c) Information Retrieval
d) Mining of data
View Answer

Answer: b
Explanation: The process of removing detail from a representation is called abstraction.

11.Which search method takes less memory?
a) Depth-First Search
b) Breadth-First search
c) Linear Search
d) Optimal search
View Answer

Answer: a
Explanation: Depth-First Search takes less memory since only the nodes on the current path are stored, but in Breadth First Search, all of the tree that has generated must be stored.

12.How many types are available in uninformed search method?
a) 3
b) 4
c) 5
d) 6
View Answer

Answer: c
Explanation: The five types of uninformed search method are Breadth-first, Uniform-cost, Depth-first, Depth-limited and Bidirectional search.

13. 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
View Answer

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

14. When is breadth-first search is optimal?
a) When there is less number of nodes
b) When all step costs are equal
c) When all step costs are unequal
d) None of the mentioned
View Answer

Answer: b
Explanation: Because it always expands the shallowest unexpanded node.

15. How many successors are generated in backtracking search?
a) 1
b) 2
c) 3
d) 4
View Answer

Answer: a
Explanation: Each partially expanded node remembers which successor to generate next because of these conditions, it uses less memory.

16. What is the space complexity of Depth-first search?
a) O(b)
b) O(bl)
c) O(m)
d) O(bm)
View Answer

Answer: d
Explanation: O(bm) is the space complexity where b is the branching factor and m is the maximum depth of the search tree.

18.Which algorithm is used to solve any kind of problem?
a) Breadth-first algorithm
b) Tree algorithm
c) Bidirectional search algorithm
d) None of the mentioned
View Answer

Answer: b
Explanation: Tree algorithm is used because specific variants of the algorithm embed different strategies.

19. Which search algorithm imposes a fixed depth limit on nodes?
a) Depth-limited search
b) Depth-first search
c) Iterative deepening search
d) Bidirectional search
View Answer

Answer: a
Explanation: None.

20. Which search implements stack operation for searching the states?
a) Depth-limited search
b) Depth-first search
c) Breadth-first search
d) None of the mentioned
View Answer

Answer: b
Explanation: It implements stack operation because it always expands the deepest node in the current tree.

21.Knowledge and reasoning also play a crucial role in dealing with _____ environment.
a) Completely Observable
b) Partially Observable
c) Neither Completely nor Partially Observable
d) Only Completely and Partially Observable
View Answer

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

22. 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) All of the mentioned
View Answer

Answer: c
Explanation: None.

23. 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
View Answer

Answer: a
Explanation: Refer definition of Knowledge based agents.

24. A) Knowledge base (KB) is consists of set of statements.
B) Inference is deriving a new sentence from the KB.
Choose the correct option.
a) A is true, B is true
b) A is false, B is false
c) A is true, B is false
d) A is false, B is true
View Answer

Answer: a
Explanation: None.

25. Wumpus World is a classic problem, best example of _____
a) Single player Game
b) Two player Game
c) Reasoning with Knowledge
d) Knowledge based Game
View Answer

Answer: c
Explanation: Refer the definition of Wumpus World Problem.

26. ‘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
View Answer

Answer: a
Explanation: Refer the definition of law of entailment.

27. Which is not a property of representation of knowledge?
a) Representational Verification
b) Representational Adequacy
c) Inferential Adequacy
d) Inferential Efficiency
View Answer

Answer: a
Explanation: None.

28. Which is not Familiar Connectives in First Order Logic?
a) and
b) iff
c) or
d) not
View Answer

Answer: d
Explanation: “not” is coming under propositional logic and is therefore not a connective.

29. 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 & It is truth preserving
View Answer

Answer: d
Explanation: None.

30. An inference algorithm that derives only entailed sentences is called sound or truth-preserving.
a) True
b) False
View Answer

Answer: a
Explanation: None.

31.What is the field of Natural Language Processing (NLP)?
a) Computer Science
b) Artificial Intelligence

c) Linguistics
d) All of the mentioned
View Answer

Answer: d
Explanation: None.

32. NLP is concerned with the interactions between computers and human (natural) languages.
a) True
b) False
View Answer

Answer: a
Explanation: NLP has its focus on understanding the human spoken/written language and converts that interpretation into machine understandable language.

33. What is the main challenge/s of NLP?
a) Handling Ambiguity of Sentences
b) Handling Tokenization
c) Handling POS-Tagging
d) All of the mentioned
View Answer

Answer: a
Explanation: There are enormous ambiguity exists when processing natural language.

34. Modern NLP algorithms are based on machine learning, especially statistical machine learning.
a) True
b) False
View Answer

Answer: a
Explanation: None.

35. Choose form the following areas where NLP can be useful.
a) Automatic Text Summarization
b) Automatic Question-Answering Systems
c) Information Retrieval
d) All of the mentioned
View Answer

Answer: d
Explanation: None.

36. Which of the following includes major tasks of NLP?
a) Automatic Summarization
b) Discourse Analysis
c) Machine Translation
d) All of the mentioned
View Answer

Answer: d
Explanation: There is even bigger list of tasks of NLP.
http://en.wikipedia.org/wiki/Natural_language_processing#Major_tasks_in_NLP.

37. What is Coreference Resolution?
a) Anaphora Resolution
b) Given a sentence or larger chunk of text, determine which words ("mentions") refer to the same objects ("entities")
c) All of the mentioned
d) None of the mentioned
View Answer

Answer: b
Explanation: Anaphora resolution is a specific type of coreference resolution.

38. What is Machine Translation?
a) Converts one human language to another
b) Converts human language to machine language
c) Converts any human language to English
d) Converts Machine language to human language
View Answer

Answer: a
Explanation: The best known example of machine translation is google translator.

39. The more general task of coreference resolution also includes identifying so-called "bridging relationships" involving referring expressions.
a) True
b) False
View Answer

Answer: a
Explanation: Refer the definition of Coreference Resolution.

40. What is Morphological Segmentation?
a) Does Discourse Analysis
b) Separate words into individual morphemes and identify the class of the morphemes
c) Is an extension of propositional logic

d) None of the mentioned
View Answer

Answer: b
Explanation: None

41.General games involves _____
a) Single-agent
b) Multi-agent
c) Neither Single-agent nor Multi-agent
d) Only Single-agent and Multi-agent
View Answer

Answer: d
Explanation: Depending upon games it could be single agent (Sudoku) or multi-agent (Chess).

42. Adversarial search problems uses _____
a) Competitive Environment
b) Cooperative Environment
c) Neither Competitive nor Cooperative Environment
d) Only Competitive and Cooperative Environment
View Answer

Answer: a
Explanation: Since in cooperative environment agents' goals are I conflicts. They compete for goal.

43. Mathematical game theory, a branch of economics, views any multi-agent environment as a game provided that the impact of each agent on the others is "significant," regardless of whether the agents are cooperative or competitive.
a) True
b) False
View Answer

Answer: a
Explanation: None.

44. Zero sum games are the one in which there are two agents whose actions must alternate and in which the utility values at the end of the game are always the same.
a) True
b) False
View Answer

Answer: b
Explanation: Utility values are always same and opposite.

45. 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.

46. 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) All of the mentioned
View Answer

Answer: 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, lose, or draw, with values +1, -1, or 0.

47. The initial state and the legal moves for each side define the _____ for the game.
a) Search Tree
b) Game Tree
c) State Space Search
d) Forest
View Answer

Answer: b
Explanation: An example of game tree for Tic-Tac-Toe game.

48. General algorithm applied on game tree for making decision of win/lose is _____
a) DFS/BFS Search Algorithms
b) Heuristic Search Algorithms
c) Greedy Search Algorithms
d) MIN/MAX Algorithms
View Answer

Answer: d
Explanation: Given a game tree, the optimal strategy can be determined by examining the min/max value of each node, which we write as MINIMAX- VALUE(n). The min/max value of

a node is the utility (for MAX) of being in the corresponding state, assuming that both players play optimally from there to the end of the game. Obviously, the min/max value of a terminal state is just its utility. Furthermore, given a choice, MAX will prefer to move to a state of maximum value, whereas MIN prefers a state of minimum value.

49. The minimax algorithm computes the minimax decision from the current state. It uses a simple recursive computation of the minimax values of each successor state, directly implementing the defining equations. The recursion proceeds all the way down to the leaves of the tree, and then the minimax values are backed up through the tree as the recursion unwinds.
a) True
b) False
View Answer

Answer: a
Explanation: Refer definition of minimax algorithm.

50. What is the complexity of minimax algorithm?
a) Same as of DFS
b) Space – bm and time – bm
c) Time – bm and space – bm
d) Same as BFS
View Answer

Answer: a
Explanation: Same as DFS

UNIT I Multiple Choice Questions

1.In a rule based system, _____are present to reflect the procedural domain knowledge
A. Rule interpreters
B. Meta-rules
C. Production rules
D. Control rules

2. What of the "rules" below is the first and most relevant robotics rule for Asimov?
A. Robots have to follow the instructions given by humans
B. Robots have to increase the profit of the business
C. A robot action must never do any damage to it
D. A robot must never take actions harmful to humans

3. Knowledge discovery is about
A. Extracting understandable knowledge
B. Improving the performance of an agent
C. Optimizing an algorithm
D. Biological behaviour in an algorithm

4. A problem which has multiple goal states is classified as
A. Structured problem
B. Unstructured problem
C. Linear problem
D. Non-linear problem

5. State space is about
A. The full problem
B. Definition to a problem
C. Representing your problem with variable and parameter
D. Problem you design

6. In a state space, the set of actions for a problem is formed by a _____
A. Set of all states
B. Initial state of the problem
C. Successor function, which takes current state and returns future states
D. Final state of the problem

7. The _____ is a touring problem in which each city must be visited exactly once and also to find the shortest tour.
A. Travelling Salesman problem
B. Computing optimal path between source and destination
C. Map coloring problem
D. Breadth first search traversal on a given tree

8. A fully observable problem belongs to the category of
A. Multi-state problem
B. Two-state problem
C. Single-state problem

D. Three-state problem

9. For a search algorithm, _____ is the input and _____ is the output
A. numerical value, algorithm
B. Problem, Solution
C. Algorithm, Data
D. Parameter, Value

10. What is the term used for describing the judgmental or commonsense part of problem solving
A. Value based
B. Critical
C. Analytical
D. Heuristic

11. The “imitation game” was originally called by its creator as
A. LISP
B. Cybernetics
C. Turing Test
D. Logic Theorist

12_____is called programming a robot by pushing this physically along the route you want it to follow
A. Environmental control
B. Continuous-path control
C. Robot computer vision control
D. Pick-and-Place control

13. What is the best way to get into game playing problem ?
A. Linear approach
B. Heuristic approach
C. Random approach
D. Optimal approach

14. A production rule has
A. A set of Rule
B. A sequence of steps
C. Both (a) and (b)
D. Arbitrary representation to problem

15. According to Rich and Knight AI is about
A. Writing efficient program for the computers
B. Writing the optimized code
C. Making computers to do things as good as humans
D. Making a computer with high processing and memory

16. What is Initial state + Goal state in Search Terminology?
A. Problem Space
B. Problem Instance

C. Problem Space Graph
D. Admissibility

17. Exploration problems are also called as
A. Observable problem
B. Non-observable problem
C. Partially observable
D. Unknown state space

18. From the given state representation, removing the detail is known as
A. Abstraction
B. Extraction
C. Mining of Data
D. Information Retrieval

19. John McCarthy invented _____ language for building AI applications
A. C
B. FORTRAN
C. Lisp
D. Java

20. Definition of a problem in a search space is through
A. Initial state
B. Final state
C. Intermediate state
D. Algorithm

Section A (30 MCQs and each question carries 1 Marks)

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

a. **Uninformed search**

b. Exhaustive search

c. Simple reflex search

d. Heuristic search

2. The search strategy will select the best expansion node at first for evaluation?

a. Greedy best-first search

b. Breadth-first search

c. Depth-first search

d. None of the mentioned

3. Which search method will expand the node based on minimal heuristic cost?

a. Depth first search

b. Bidirectional search

c. A*search

d. None of the mentioned

4. Which search technique imposes the working of BFS and DFS in a hybrid fashion?

a. Depth-limited search

b. Uniform Cost search

c. Iterative deepening search

d. Bidirectional search

5. Depth limited search technique in terms of evaluation based on optimality and completeness is

a. Both Complete and Optimal

b. Complete but not optimal

c. Optimal but not Complete

d. **Not Optimal and not Complete**

6. Which is the best way to go for Game playing problem?

a. Linear approach

b. Heuristic approach

c. Random approach

d. Stratified approach.

7. Identify the strategies which know one non goal states are better or promising than other non goal state

a. Forward search

b. Backward search search

c. Systematic search

d. Heuristic search

8. Which Data structure is implemented for Uniform Cost Search?

a. Stack

b. Queue

c. Priority Queue

d. Tree

9. Which search algorithm will use limited amount of memory?

a. RBFS

b. SMA*

c. Hill-climbing search algorithm

d. Both a & b

10. A space where neighbourhood states have the same value as the parent state and causes a problem in the hill climbing is,

a. Global maxima

b. Local maxima

c. Plateau

d. Ridges

11. What helps Simulated Annealing get out of local minima?

a. The acceptance threshold is established probabilistically.

b. **The exponential form of the Metropolis condition, i.e., that p is less than exp (-DE/kT) where DE is the change in energy, T the temperature, and k is a constant.**

c. Annealing follows a declining temperature schedule.

d. Positive energy changes are not discarded automatically.

12. A knowledge-based agent needs a _____

a. Knowledge base
b. Inference mechanism
c. Both (a) and (b)
d. Neither (a) and (b)

13. What is meant by simulated annealing in artificial intelligence?

a. Returns an optimal solution when there is a proper cooling schedule

b. Returns an optimal solution when there is no proper cooling schedule

c. It will not return an optimal solution when there is a proper cooling schedule

d. None of the mentioned

14. The search methods that work on one state, with an aim to improve it step-wise belong to the category of

a. Best first search

b. Depth first search

c. AO*

d. **Local search methods**

15. If heuristic is admissible, then A* guarantees that it will be

a. Complete

b. **Optimal**

c. Both (a) and (b)

d. Time efficient

16. Properties of quantifiers _____

a. $\exists x \forall y$ is same as $\forall y \exists x$
b. $\exists x \exists y$ is the same as $\exists y \exists x$
c. $\exists x \exists y$ is not same as $\exists y \exists x$

d. ∃x ∃y is not same as ∃y ∃x

17. Deriving sentences from other sentences is referred as _____

a. Inference
b. Completeness
c. Syntax
d. Semantics

18. _____ is a collection of facts expressed in predicate calculus.

a. Fact base
b. Clause form
c. Logic
d. Unification

19. Given expression sinks(X) ∨ dissolves(X, water) ∨ ¬denser(X, water) is referred as
a. Fact base
b. Clause form
c. Both (a) and (b)
d. Neither (a) and (b)

20. Semantic networks can show inheritance based on,
a. have-a, to relationship
b. is-a, has-a relationship
c. belongs-to relationship
d. Both (a) and (b)

21. Find out the contradiction preposition

a. P ∨ ~P
b. **P ∧ ~P**
c. P ⇒ P
d. P ⇔ P

22. Choose the ISA relationship in the following

a. Tendulkar - Batsman
b. Stumps - Bails
c. Warne - Wickets
d. Batsman – Cricketer

23. Clause with at most one positive literal is known as

a. CNF
b. DNF
c. Horn Clause
d. Both CNF and DNF

24. 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 & It is truth preserving**

25. Which is also called single inference rule?

a. Reference

b**. Resolution**

c. Reform

d. None of the mentioned

26. 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

27. What are the undesirable properties of knowledge?

a. Voluminous

b. Difficult to characterize

c. Variability

d. **All of the above**

28. Judgemental or commonsense part of problem solving is referred by the term,

a. **Heuristic**

b. Critical

c. Value based

d. Analytical

29. Choose the equivalent preposition for the preposition (~a V ~b)

a. (a ∧ b)

b. ~(a ∧ b)

c. (a ∨ b)

d. ~(a ∨ b)

30. Identify the following which would fail when Unification algorithm is applied,

a. Unify(Friends(Ram, x),Friends(Rita,Lakshman)

b. Unify(Friends(Ram, x),Friends(x, Kannan))

c. Unify(Friends(Ram, x), Friends(y, Ravi))

d. Unify(Friends(Ram, x), Friends(z, Murugan))

Section B (Each question carries two marks)

31. Identify the condition, at which breadth first algorithm is optimal.

a. Less number of nodes present

b. All the step costs are equal

c. Each step costs are not same

d. Step cost increases or decreases linearly

32. Which Data structure is implemented effectively for BFS and DFS?

i. FIFO Queue for BFS

ii. LIFO Stack for DFS

iii. FIFO Queue for DFS

iv. LIFO Stack for BFS

a. i & ii

b. i & iv

c. ii & iii

d. All the above

33. Which of the following predicate calculus statements is / are valid:

a) $(\forall x)\, P(x) \vee (\forall x)\, Q(x) \rightarrow (\forall x)\{P(x) \vee Q(x)\}$

b) $(\exists x)\, P(x) \wedge (\exists x)\, Q(x) \rightarrow (\exists x)\{P(x) \wedge Q(x)\}$

c) $(\ \ x)\{P(x) \vee Q(x)\} \rightarrow (\ \ x)\, P(x) \vee (\ \ x)\, Q(x)$

d) $(\exists x)\{P(x) \vee Q(x)\} \rightarrow \sim (\ \ x)\, P(x) \vee (\exists x)\, Q(x)$

34. Which one of the following is the most appropriate logical formula to represent the statement?
" Gold and silver ornaments are precious".

G(x): x is a gold ornament
S(x): x is a silver ornament
P(x): x is precious

a) $x\,(P(x) \rightarrow (G(x) \wedge S(x)))$

b) $x\,((G(x) \wedge S(x)) \rightarrow P(x))$

c) $\exists x ((G(x) \wedge S(x)) \rightarrow P(x))$

d) $\forall x ((G(x) \vee s(x)) \rightarrow P(x))$

35. If F_1, F_2 and F_3 are propositional formulae such that $F_1 \wedge F_2 \rightarrow F_3$ and $F_1 \wedge F_1 \rightarrow \sim F_2$ are both Tautologies, then which of the following is true:

a) Both F_1 and F_2 are tautologies

b) The conjunction $F_1 \wedge F_2$ is not satisfiable

c) The conjunction $F_1 \wedge F_2$ is not satisfiable

d) Neither is satisfiable

Section C

36. A. (i) Differentiate simple hill Climbing and Steepest Hill climbing. (3 Marks)

Simple hill climbing:

(i) Does not aggressively select the next best node

(ii) Do not exhaustively search for the next best node

(iii) Also called heuristic based search method

Steepest Hill climbing:

(i) Aggressive in selecting next best successor node

(ii) Generates maximum successor nodes with all possible moves and selects the very best node

(iii) Has higher complexity than simple hill climbing

(ii) List the criteria to measure the performance of search strategies. (2 Marks)

Completeness
Optimality
Time complexity
Space complexity

(Atleast a single line about each criteria)

(or)

36. **B. (i) Write the stepwise approach taken in IDA* algorithm. (3 Marks)**

Step 1: At firswt, set the limit =h(root). We can call this as f-limit

Step 2: The next step is pruning if any node does not satisfy the limit condition, (i.e.) prune if f(node) > f-limit

Step 3: Set f-limit to be equal to the minimum cost of any node that is pruned

(ii**) Brief the problem with overestimating of h(n) in A* algorithm (2 Marks)**

In any graph where the edge cost or path cost is overestimated, the quality of the estimated cost will lead to selection of paths which at the end be a costlier path when some ideal path exist. (Any example, diagrams)

37. A. **Convert the following rule into Conjunctive Normal Form (CNF) (5 Marks)**
B[1,1] ⇔ P[1,2] V P[2,1]
Write the stepwise conversion into CNF form.

B[1,1] <-> P[1,2] V P[2,1]
Steps:
1. Eliminate <-> with -> ^ ->
(B[1,1] -> (P[1,2] V P[2,1])) ^ ((P[1,2] V P[2,1]) -> B[1,1])
2. Eliminate ->
A -> B can be written as ~A V B
(~B[1,1] V P[1,2] V P[2,1]) ^ (~(P[1,2] V P[2,1]) V B[1,1])
3. CNF requires negation only for literals
Demorgan's law ~(A V B) = ~A ^ ~B
(~B[1,1] V P[1,2] V P[2,1]) ^ (~P[1,2] ^ ~P[2,1]) V B[1,1]
4. According to CNF, it is the conjunction of disjunction of literals
According to distributive law, (A ^ C) V B = (AV B) ^ (C V B)
(~B[1,1] V P[1,2] V P[2,1]) ^ (~P[1,2] V B[1,1]) ^ (~P[2,1] V B[1,1])

(or)

37. **B. (i) Explain Proof by Refutation with a simple example. (3 Marks)**
Any propositional logic statement using symbols.
Check the logic, (A is a symbol for a propositional logic)
if A is valid, then ~A is unsatisfiable and it should be proved that A is satisfiable if ~A is not valid

(ii) Distinguish Declarative and Procedural knowledge. (2 Marks)
Declarative: Knowledge is specified but the extent upto which the knowledge is required is not specified. It should be augmented with the program that specifies what is to be done and how it is to be done.

Procedural: The control information required to make use of the knowledge is embedded in the knowledge. An interpreter is required that understands the instructions in the knowledge. It has heuristic too to have the result generated.

15CS401 – Artificial Intelligence
Multiple Choice Questions

1. Knowledge in AI is about,
A. Raw data
B. Sorted raw data
C. Set of rules
D. Set of patterns and associations derived from data

2. The systematic process of relating events to conclude the problem is,
A. Knowledge base
B. Reasoning
C. Searching techniques
D. Knowledge representation

3. The data structure in which the facts are mapped into relations is,
A. Inheritable knowledge structure
B. Inferential knowledge structure
C. Relational knowledge structure
D. Procedural knowledge structure

4. Which of the following statement is false?
A. The actions of knowledge based agent is arbitrary
B. The current action should be updated in the knowledge base
C. Knowledge agent depends on knowledge base
D. An agent is one who acts according to the environment

5. Predicate logic is also called as
A. Propositional logic
B. Second order logic
C. First order logic
D. Simple logic

6. In which of the following, the process starts with known facts
A. Forward chaining
B. Horn clause
C. Backward chaining
D. Goal driven method

7. Backward chaining is also referred as
A. Horn clause
B. Forward chaining
C. Predicate logic
D. Goal driven method

8. _____ is deriving a general rule from the background knowledge and observation
A. Deduction
B. Induction

C. Abduction
D. Conclusion

9. Identify the logic which includes the facts, relationships and the objects,
A. Predicate logic
B. Binary logic
C. Propositional logic
D. Fuzzy logic

10. _____ states that the sentence is always true in all the models.
A. Satisfiability
B. Contradiction
C. Tautology
D. Predicate logic

11. The process of deriving conclusion from the given axioms and facts is,
A. Abduction
B. Induction
C. Resolution
D. Deduction

12. Which of the following clearly defines a frame system?
A. An inference system
B. A system that maps the facts and beliefs
C. A form of knowledge representations
D. A system with a set of facts and its instances

13. The process of finding substitutions to make different logical expressions looks identical is
A. Unification
B. Universal Instantiation
C. Existential Instantiation
D. Modus Ponen

14. Identify the one which is not a type of inference style
A. Backward chaining
B. Forward chaining
C. Modus ponen
D. Resolution refutation

15. When does forward chaining cannot proceed further?
A. When it comes across atomic sentences
B. When it comes across complex sentences
C. When it comes across horn clause
D. When there is no further inference

16. Identify the rule which gives a complete inference algorithm along with a search algorithm.
A. And Elimination
B. Resolution

C. Modus ponen
D. Refutation

17. _____ logic contains only declarative sentence
A. Predicate logic
B. First order logic
C. Propositional logic
D. Relational knowledge structure

18. A procedure approach that produces proof by contradiction is
A. Abduction
B. Refutation
C. Logic programming
D. Deduction

19. Translate the following statement into First Order Logic.
"For all *x*, if *x* is a master student, then *x* has a bachelor degree"
A. ∀ *x* Master(*x*) -> Bachelor(*x*)
B. ∃ *x* Master(*x*) -> Bachelor(*x*)
C. A is true, B is true
D. A is false, B is false

20. There are two statements
A(x): x is a businessman
B(x): x is having a bank account
To imply the fact that every businessmen are having a bank account can be mapped as
A. ∀x (A(x)->B(x))
B. ∃x (A(x)->B(x))
C. ∀x (B(x)->A(x))
D. ∃x (B(x)->A(x)

15CS401– Artificial Intelligence

UNIT – 4

MCQ

1. 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

2. Uncertainty arises in the Wumpus world because the agent's sensors give only _____
   a) Full & Global information
   b) Partial & Global Information
   c) Partial & local Information
   d) Full & local information

   Answer :c

3. A plan that describe how to take actions in levels of increasing refinement and specificity is _____
   a) Problem solving
   b) Planning
   c) Non-hierarchical plan
   d) Hierarchical plan
   Answer :d

4. What are you predicating by the logic: ∀x: €y: loyalto(x, y).
   a) Everyone is loyal to someone
   b) Everyone is loyal to all
   c) Everyone is not loyal to someone
   d) Everyone is loyal
   Answer :a

5. 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

6. Which algorithm places 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

7. Wumpus World is a classic problem, best example of _____
a) Single player Game
b) Two player Game
c) Reasoning with Knowledge
d) Knowledge based Game
Answer :c

8. Which data structure is used to give better heuristic estimates?
a) Forwards state-space
b) Backward state-space
c) Planning graph algorithm
d) None of the mentioned
Answer : c

9. Which of the following is not the style of inference?
a) Forward Chaining
b) Backward Chaining
c) Resolution Refutation
d) Modus Ponen
Answer :d

10. Translate the following statement into FOL.
"For every a, if a is a PhD student, then a has a master degree"
a) ∀ a PhD(a) -> Master(a)
b) ∃ a PhD(a) -> Master(a)
c) A is true, B is true
d) A is false, B is false
Answer :a

11. General algorithm applied on game tree for making decision of win/lose is _____.
    a. DFS/BFS Search Algorithms
    b. Heuristic Search Algorithms

c. Greedy Search Algorithms
d. MIN/MAX Algorithm

Answer : a

12. Which search is equal to minimax search but eliminates the branches that can't influence the final decision?
    a. Depth-first search
    b. Breadth-first search
    c. Alpha-beta pruning
    d. None of the mentioned

    Answer :c
13. Which search is similar to minimax search?

    Hill-climbing search
    Depth-first search
    Breadth-first search
    All of the mentioned

    Answer :b

14. Which value is assigned to alpha and beta in the alpha-beta pruning?
    a. Alpha = max
    b. Beta = min
    c. Beta = max
    d. Both a & b

    Answer :d

15. What is the other name for forward state-space search?
    a. Progression planning
    b. Regression Planning
    c. Test planning
    d. None of the above

    Answer : a

16. What is the main advantage of backward state-space search?
    a. Cost
    b. Actions
    c. Relevant actions
    d. All of the mentioned

    Answer : c

17. The process by which the brain incrementally orders actions needed to complete a specific task is referred as _____

    A.Total order planning
    B. Planning problem

C. Partial order planning
D. Both B and C

Answer : c

18. What is the advantage of totally ordered plan in constructing the plan?

A. Reliability
B. Easy to use
C. Flexibility
D. All of the above

Answer : c

19. What is the main challenge/s of NLP?
a) Handling Ambiguity of Sentences
b) Handling Tokenization
c) Handling POS-Tagging
d) All of the mentioned

Answer : a

20. Which of the below are NLP use cases?
a. Detecting objects from an image
b. Facial Recognition
c. Speech Biometric
d. Text Summarization

Answer : d

21. Choose form the following areas where NLP can be useful.

a. Automatic Text Summarization
b. Automatic Question-Answering
c. Information Retrieval
d. All of the above

Answer : d

22. In linguistic morphology _____ is the process for reducing inflected words to their root form.
a) Rooting
b) Stemming
c) Text-Proofing
d) Both Rooting & Stemming

Answer : b

23. Incorrect information results in unsatisfied preconditions for actions and plans _____ detects violations of the preconditions for successful completion of the plan.
    a. Conditional Plan
    b. Conformant Planning
    c. Execution monitoring
    d. Both Conditional Plan & Execution monitoring
    Answer : c

24. Standard planning algorithms assumes environment to be
    1. Deterministic
    2. Fully observable
    3. Single agent
    4. Stochastic
    Answer : a

25. _____ planning allows the agent to take advice from the domain designer in the form of decomposition rules.

    a. GraphPlan
    b. Hierarchical task network (HTN)
    c. SatPlan
    d. None of the mentioned
    Answer : b

26. _____ planning allows the agent to take advice from the domain designer in the form of decomposition rules.
    a. GraphPlan
    b. Hierarchical task network (HTN)
    c. SatPlan
    d. None of the mentioned
    Answer : a

27. In NLP, The process of identifying people, an organization from a given sentence, paragraph is called
    a. Stemming
    b. Lemmatization
    c. Stop word removal
    d. Named entity recognition
    Answer : d

28. Which of the text parsing techniques can be used for noun phrase detection, verb phrase detection, subject detection, and object detection in NLP.
    a. Part of speech tagging
    b. Skip Gram and N-Gram extraction
    c. Continuous Bag of Words
    d. Dependency Parsing and Constituency Parsing
    Answer : d

29. Which of the following techniques can be used for keyword normalization in NLP, the process of converting a keyword into its base form?
    a. Lemmatization
    b. Soundex
    c. Cosine Similarity
    d. N-grams
    Answer: a)

30. What is Morphological Segmentation?
    a) Does Discourse Analysis
    b) Separate words into individual morphemes and identify the class of the morphemes
    c) Is an extension of propositional logic
    d) None of the mentioned
    Answer : b

1. Plan-space planning is about,

A. The plan is found as a search through search space

B. The search happens through sequence of state space only

C. Starting with incomplete plan and later on reordering is done in the plan to get accurate plan

D. Searching state space in both forward and backward direction

Ans: C

2. The planning which solves the sub problems simultaneously,

A. Sequential planning

B. Continuous planning

C. Reactive planning

D. Non-linear planning

Ans: D

3. _____, is also called as contingency planning

A. Linear planning

B. Knowledge based planning

C. Conditional planning

D. Hierarchical planning

Ans: C

4. Regression planner belongs to the category of

A. Totally ordered planners

B. Backward state space search planning

C. Forward state space search planning

D. Partial ordered planning

Ans: B

5. _____ splits the actions into sub-tasks. Based on the priority of the tasks, the operators are planned.

A. Continuous planning

B. Hierarchical planning

C. Conditional planning

D. Reactive planning

Ans: B

6. _____ provides a mathematical framework to be used in the reasoning process during the planning

A. Temporal logic

B. Conditional planning

C. Hierarchical planning

D. Non linear planning

Ans: A

7. _____ planners provides two actions to a plan without mentioning which actions should come first

A. Partial order

B. Temporal logic

C. Hierarchical

D. Continuous

Ans: A

8. In linguistic morphology _____ is the process for reducing inflected words to their root form.
A. Rooting
B. Stemming
C. Text-Proofing
D. Both Rooting & Stemming

Ans: B

9. Which of the following checks the correctness of the sentence grammatically?

A. ATN

B. RTN

C. Indexing

D. Wrappers

Ans: ATN

10. Which of the following holds a property of minimax algorithm?
A. Max(x,y) = Min(x,y)
B. Max(x,y) = Min(-x,-y)*Max(-x,-y)
C. Max(x,y) = - Min(-x,-y)
D. None of the above
Ans: C

11. If b is the branching factor and d is the maximum depth of the search tree, time complexity of minimax algorithm is written as

A. $O(d^b)$
B. $O(b^{d+b})$
C. $O(b^d)$
D. $O(d^3)$
Ans: C

12. Increasing the depth of the game tree leads to
A. less space complexity
B. no insights and reduction in number of moves
C. more insights and complexity in number of moves
D. None of the above
Ans: C

13. What values are assigned to alpha and beta in the alpha-beta pruning?
A. Alpha = min, Beta = max
B. Alpha=min, Beta = min
C. Alpha=max, Beta = max
D. Alpha = max & Beta = min
Ans: D

14. Game tree may result in to
A. Infinite search tree
B. Finite search tree
C. Incomplete search tree
D. Complete search tree
Ans: A
15. _____ process converts the outcome of FIS into crisp value

A. Composition process
B. Fuzzification
C. Membership functions
D. Defuzzification

Ans: D

16. _____ is data driven approach and _____ is goal driven approach
A. Forward chaining, Backward chaining
B. Backward chaining, Forward chaining
C. Fuzzy, Binary
D. Binary, Fuzzy

Ans: A

17. Identify the expert system used for chemical analysis
A. MYCIN
B. DENDRAL

C. Both MYCIN and DENDRAL
D. General problem solver
Ans: B

18. The process of coding the knowledge in expert system is
A. Knowledge base
B. Knowledge engineering
C. Knowledge acquisition
D. Data collection

Ans: B

19. Empty MYCIN falls under the category of
A. Shell
B. Rule based expert system
C. Frame based expert system
D. Fuzzy based expert system

Ans: A

20. The core part of decision-making for the expert system lies in the
A. Knowledge base
B. Explanations
C. Inference mechanism
D. Facts

Ans: C

PART B

21. The main condition required to decide whether it’s worth looking at tree’s right node or not in alpha-beta pruning is
A. alpha<=beta
B. alpha>=beta
C. alpha=beta
D. alpha!=beta
Ans: B

22. Which search is equal to minimax search but eliminates the branches that can't influence the final decision?
A. Depth-first search
B. Breadth-first search
C. Alpha-beta pruning
D. All of the above
Ans: C

23. There is a need to delay the choice in a search problem. Identify a suitable approach.

A. Least commitment
B. First commitment
C. First commitment followed by least commitment
D. Least commitment followed by first commitment

Ans: A

24. 'Ram is a good man. He is very intelligent too'. In the above statement the word 'He' refers 'Ram' and it is identified based on
A. Lemmatization
B. Stemming
C. Anaphoria
D. Tokenization
Ans: C

25. Which values are independent in decision making of minimax search algorithm?
A. Pruned leaves x and y
B. Every state is dependent
C. Root is independent
D. None of the above
Ans: A