Subject Name: Artificial Intelligence
Subject Code:3170716

Faculty Name: Bhumin Mandaliya, Poonam Patel

Sr. No	CHAPTER NO - 1 : What is AI:	Marks
	TOPIC:1 The AI Problems	
	DESCRIPTIVE QUESTIONS	
1	What is Intelligence? Discuss types of problems requiring Intelligence to solve it. Define AI.**(Oct-2012)[LJIET]** Differentiate Natural & Artificial Intelligence. Explain types of problems which requires AI techniques to be solved.**(Nov-2017)[LJIET]** Explain AI Problems.**[LJIET]** Enlist and discuss the major task domains of Artificial Intelligence. **[New](Nov-2019)[LJIET]**	**05, 07, 07, 07**
2	What is artificial intelligence? Define the different task domains of artificial intelligence.**(Sep-2013)[LJIET]** Define and discuss different task domain of artificial intelligence.**[New](Nov-2018)[LJIET]**	**02, 03**
3	Define the term "Artificial Intelligence". Explain how AI techniques improve real-world problem solving. **[New](Nov-2019)[LJIET]**	**03**
4	Artificial Intelligence is about_____.**[LJIET]** Playing a game on Computer. Making a machine Intelligent. Programming on Machine with your Own Intelligence. Putting your intelligence in Machine. Playing a video game. All of the mentioned **Ans. Making a machine Intelligent.**	**01**
5	The application/applications of Artificial Intelligence is/are:**[LJIET]** Expert Systems Gaming Vision Systems Common sense reasoning Financial analysis All of mentioned **Ans. All of mentioned**	**01**
6	Medical diagnosis is _____ type of task**[LJIET]** Mundane task Expert task Formal task Routine task Perfect task Inference task **Ans. Expert task**	**01**
	TOPIC:2 What Is An AI Techniques	
	DESCRIPTIVE QUESTIONS	
1	Discuss following: Turing Test**(Oct-2016)[New](Nov-2017)[New](May-2018)[LJIET]**	**3.5, 4, 3**
2	Explain the "Turing test". Discuss its significance as criteria for success of an intelligent	**07**

	machine**. (May-2017) [LJIET]**	
3	Explain AI Technique in details. **[LJIET]**	**07**
4	Explain "Intelligence Requires Knowledge". **[LJIET]**	**04**
5	Explain the "Turing test". Discuss its importance in intelligence machine. **(Nov-2019) [LJIET]**	**07**
6	What is the significance of the "Turing Test" in AI? Explain how it is performed. **[New](Nov-2019)[LJIET]**	**04**
7	Which of the following are tasks of AI?**[LJIET]** A) Mundane tasks B) Formal tasks C) Expert tasks D) All of the mentioned E) Only A and B F) Only B and C **Ans.** D) **All of mentioned**	**01**
8	Define the following words in the context of AI**(Oct-2020)[LJIET]** (i) Intelligence (ii) Knowledge (iii) Information (iv) logical reasoning	**04**
	CHAPTER NO - 2 : Problems, State Space Search & Heuristic Search Technique:	
	TOPIC:1Problems, State Space Search	
	DESCRIPTIVE QUESTIONS	
1	Explain the State Space with the use of Water Jug Problem.**(May-2012)[New](Nov-2018)[LJIET]** What is state space representation of a problem? Show the state space of the water jug problem.**[New](April-2017)[LJIET]** What do you mean by state space representation of a problem? Illustrate how you can represent following water jug problem as a state space search: There are two jugs (without any measuring marks on them) of 4 and 3 liters capacity, respectively. There is a tap of water to fill the jugs. The objective is to fill the 4-liter jug with exactly 2 liter of water. **(May-2014)[LJIET]** Solve WaterJug Problem using production rule system.**(Nov-2014)(Nov-2017)(Oct-2012)[LJIET]** Consider the Water Jug problem as stated here: "You are given two jugs, a 4- gallon one and a 3-gallon one. Neither has any measuring markers on it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2 gallons of water into the 4-gallon jug?" Represent this as a problem in State Space Search and state its Production Rules. Show at least one solution to this problem.**(May-2017) [LJIET]** Explain and solve water jug problem.**(May-2018) [LJIET]** For the Water Jug problem, describe state space representation, actions, start and end state. **[New](May-2019)[LJIET]** Consider the Water Jug problem stated below: **Water Jug Problem:** "You are given two jugs, a 4-gallon one and a 3-gallon one. Neither has any measuring markers on it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2 gallons of water into the 4-gallon jug? " Explain how this problem can be solved using State Space Search. Also, give the Production Rules to solve this problem and derive ONE feasible solution using the same. **[New](Nov-2019)[LJIET]**	**07, 07, 07, 07, 07, 07, 09, 07, 07, 07, 07**
2	What is state space of a problem? **[New](May-2018)[LJIET]**	**03**
3	Differentiate the DFS and BFS with merits and demerits. **(May-2012)(Nov-2018) [LJIET]** Explain & Compare DFS & BFS search algorithm.**(Oct-2012)[LJIET]** Explain depth first search (DFS) and breadth first search (BFS) with suitable examples.	**07,07, 07, 07, 07,07,07**

	Why is 'depth limited search' necessary in DFS?**(May-2014)[LJIET]** Explain Depth first search and Breadth first search with example.**(Nov-2014)[LJIET]** Given an example of a problem for which breadth-first search would work better than depth-first search.**(May-2016)(May-2018)[LJIET]**	
4	What is depth first search? Explain algorithm and its advantages.**(Sep-2013) [LJIET]**	**07**
5	Explain Depth First Search algorithm. **[New](Nov-2018)[LJIET]**	**04**
6	Explain any problem solved using Depth First Search technique. **(Nov-2017) (Nov-2019) [LJIET]**	**07,07**
7	What are the Problem Characteristics of Artificial Intelligence?**(May-2012)(Nov-2018) [LJIET]** Discuss the AI Problem Characteristics in detail.**(May-2013)[LJIET]** Define AI? Explain the characteristics of AI problem.**(Nov-2014)[LJIET]** How problem characteristics help in the selection of AI technique? Explain these characteristics with possible examples. **(May-2015)[LJIET]** Discuss with examples: AI Problem Characteristic. **[New](Nov-2017) [LJIET]**	**07,07,07 , 07, 07, 07**
8	Analyze (a) 8-puzzle, (b) Chess and (c) Tower of Hanoi problems with respect to the following problem characteristics:**(Oct-2016)[LJIET]** i. Is the problem decomposable? ii. Can solution step be ignored? iii. Is the good solution absolute or relative? iv. Is the solution state or a path? v. What is the role of knowledge? Discuss and analyze tower of Hanoi problem with respect to seven problem characteristics. **[New](May-2018)[LJIET]**	**07,07**
9	Solve 8 Puzzle problem by any AI Technique.**(Oct-2012)[LJIET]** Explain the State Space with the use of 8 Puzzle Problem.**(May-2013)(May-2016)(May-2018)(Nov-2018) [LJIET]** Explain State Space Search using 8 Puzzle problem.**(Nov-2017)[LJIET]** What is state space representation of a problem? Show the state space of the 8 puzzle problem.**[New](Nov-2017) [New](Nov-2018)[LJIET] [LJIET]** Explain State Space Search using 8 Puzzle problem.**(Nov-2019)[LJIET]**	**07,07, 07, 07, 07, 07,07,07 ,07**
10	What is production system? Explain it with an example. Discuss the characteristics of a production system. **(Sep-2013) [LJIET]**	**05**
11	Solve Travelling Salesman Problem using any AI technique.**(Nov-2014)(May-2016) [LJIET]**	**07, 07**
12	Analyze following problems with respect to the 7 problem characteristics of AI. i. 8-puzzle ii. Traveling salesman**(Dec-2015) [LJIET]**	**07**
13	Discuss various issues in design of search program. **[New](Nov-2017) [LJIET]**	**04**
14	Describe Breadth First Search. Comment on optimality of this method. **[New](May-2018)[LJIET]**	**04**
15	Discuss seven problem characteristics to decide appropriate A.I. technique to use for problem solving. **(May-2019) [LJIET]**	**07**
16	What is state space representation? Explain with an example. **(May-2019) [LJIET]**	**07**
17	Describe DFS and BFS. How can they be used for searching? Give one application for which DFS or BFS can be applied for searching the solution. **(May-2019) [LJIET]**	**07**
18	Explain & Solve Water-Jug Problem **(Nov-2019) [LJIET]**	**07**
19	Describe Depth First Search.**[New](May-2019)[LJIET]**	**04**
20	Explain what is meant by "Production System" with respect to AI. Discuss the components of a	**04**

	Production System. **[New](Nov-2019)[LJIET]**	
21	Differentiate between Breadth First Search and Best First Search. **[New](Nov-2019)[LJIET]**	**04**
22	_____ denotes number of moves in tower of Hanoi problem?(n is no. of discs)**[LJIET]** 2^n +1 2^n 2^n -1 n^2 n n+1 **Ans. 2^n -1**	**01**
23	Depth First Search employs _____ data structure.**[LJIET]** Queue Linked list Tree Graph Array Stack **Ans. Stack**	**01**
24	Travelling salesman problem employs _____ technique.**[LJIET]** Backward function Substitution function Nearest neighbour function Heuristic function Specification technique Branch & Bound technique **Ans. Branch & Bound technique**	**01**
25	What will be the advantage of representing search graph instead of search tree? **[LJIET]** A) Less memory occupied B) Less no. of nodes required C) Repeating nodes can be eliminated D) Only B & C E) Only A & B F) All A, B & C **Ans. All A, B & C**	**01**
26	What do you understand by Backtracking? What is natural advantage of Backtracking**?(Oct-2020)[LJIET]**	**03**
27	Draw the state space for given problem. You have three jugs of capacity of 12 lietrs, 8 literss, and 3 liters. 12 liter of Jug is full of water while other two jugs are given empty. You have to obtain 2 liters of water in 12 liters of jug. You can pour the water on the ground. But no additional water is given. Formulate the state space for the given problem. Solve the problem and suggest the strategy.**(Oct-2020)[LJIET]**	**07**
	TOPIC:2 Additional Problems	
	DESCRIPTIVE QUESTIONS	
1	Explain Missionaries and cannibals problem. **[LJIET]** In the Missionaries and Cannibals Problem, three missionaries and three cannibals must cross a river using a boat which can carry at most two people, under the constraint that, Number of cannibals should be lesser than the missionaries on either side. The boat cannot cross the river by itself with no people on board.	**05,07**

	For the above mentioned problem, describe state space representation, actions, start and end state.**[New](May-2018)[LJIET]**	
2	Explain Tower of Hanoi problem. **[LJIET]**	**05**
3	Explain Monkey and Banana problem. **[LJIET]**	**05**
	TOPIC:3 Heuristic Search Technique	
	DESCRIPTIVE QUESTIONS	
1	What is Hill Climbing? Explain Simple Hill Climbing and Steepest- Ascent Hill Climbing.**(May-2012)(May-2016)(Nov-2018) (Nov-2019) [LJIET]** What is hill climbing? Explain steepest-ascent hill climbing algorithm.**(Sep-2013)[LJIET]** Explain Steepest ascent Hill climbing algorithm.**(Oct-2012)[LJIET]**	**07, 07, 07, 07, 07, 07**
2	Discuss steepest ascent hill climbing. **[New](Nov-2017) [LJIET]**	**03**
3	What do you mean by the problem of plateau occurring in hill climbing? How can it be solved?**(May-2014)[LJIET]**	**02**
4	Explain the method of Hill climbing. Also explain the problems associated with hill climbing and possible solutions.**(May-2015)[LJIET]**	**07**
5	Discuss hill climbing search method. Also discuss limitations and ways to overcome these limitations.**(Dec-2015)[New](April-2017)[LJIET]**	**07, 07**
6	Discuss limitations of Hill climbing search method. **[New](Nov-2017) [LJIET]**	**03**
7	Explain the situations under which Hill Climbing may fail to find a solution. What can be done to overcome these situations?**(May-2017)[LJIET]**	**07**
8	Discuss limitation of hill-climbing method. **[New](May-2019)[LJIET]**	**03**
9	Explain OR graphs.**[LJIET]**	**05**
10	Explain A* algorithm.**(Oct-2012)(Nov-2017)(Nov-2018) [LJIET]** Explain A* algorithm in detail.**(Sep-2013)(May-2016)(May-2018)[LJIET]** Discuss A* algorithm. Give one example where it is suitable to apply.**(Dec-2015)(Nov-2019) [LJIET]** Discuss A* algorithm. Also give one example to explain it. **[New](May-2019)[LJIET]**	**07,07,07 , 07,07, 07, 07, 07, 07**
11	Explain AO* algorithm.**(Nov-2014)[New](Jan-2021)[LJIET]** Explain AO* algorithm with Example.**(Oct-2016)[LJIET]** Discuss AO* algorithm. Give one example where AO* is suitable to apply**(Dec-2015) [LJIET]**	**07, 04, 07,07**
12	What do you mean by admissibility of an algorithm? Is A* algorithm an admissible one? When?**(May-2014)[NEW](Nov-2018)[LJIET]**	**02,03**
13	Explain mean-end analysis approach to solve AI problems.**(Oct-2012)[New](Nov-2018)[LJIET]**	**07,07**
14	What is local maximum, Plateau and Ridge?**(May-2013)[LJIET]**	**07**
15	Explain the Best-First-Search Procedure with example.**(May-2013)[LJIET]** Define "Heuristic Search". Explain the steps in "Best First Search" and illustrate it using a suitable example.**(May-2017)[LJIET]**	**07, 07**
16	Explain Best First Search method. **[New](Nov-2017) [LJIET]**	**04**
17	Explain simulated annealing algorithm.**(May-2014)(Nov-2014)(May-2018)[LJIET]** Discuss simulated annealing search method. Which types of problems are suitable to solve using this method?**(Dec-2015)[LJIET]** Explain Simulated Annealing search with suitable example. **(Nov-2017)[LJIET]**	**07,07, 07, 07, 07**
18	Discuss Simulated Annealing method of search. **[New](Nov-2017)[LJIET]**	**04**
19	Discuss Simulated Annealing search method. How is it different than greedy method? **[New](May-2019)[LJIET]**	**07**
20	Discuss Hill climbing and Simulated Annealing. State the differences between these two	**07,07,07**

	methods.**(Oct-2016) [LJIET]** Discuss simulated annealing search method. Compare it with hill climbing method. **[New](May-2018)[LJIET]** **OR** Discuss Simulated Annealing search method. Compare it with hill climbing search method **(May-2019)[LJIET]**	
21	What do you mean by constraint satisfaction problems? Explain constraint propagation algorithm using suitable example. **(May-2014)[LJIET]**	**07**
22	Consider the following initial and goal configuration for 8-puzzle problem. Draw the search tree for initial three iterations of A* algorithm to reach from initial state to goal state. Assume suitable heuristic function for the same.**(May-2015)[LJIET]** Initial state | | 1 | 2 | | 3 | 4 | 5 | | 6 | 7 | 8 | Goal state | 1 | 2 | 3 | | 8 | | 4 | | 7 | 6 | 5 |	**07**
23	Consider the following initial and goal configuration for 8-puzzle problem. Draw the search tree. Apply A* algorithm to reach from initial state to goal state and show the solution. Consider Manhattan distance as a heuristic function (i.e. sum of the distance that the tiles are out of place.). **[New](April-2017)[LJIET]** Initial State | 1 | 2 | 3 | | 7 | 8 | 4 | | 6 | | 5 | Goal State | 1 | 2 | 3 | | 8 | | 4 | | 7 | 6 | 5 |	**07**
24	Describe different heuristics for the Blocks world problem.**[New](Nov-2017)[LJIET]**	**03**
25	Describe different heuristics for the following types of problems:**(Dec-2015)[LJIET]** I. Blocks world II. Tic Tac Toe	**07**
26	Explain AND-OR graphs.**(May-2014)[LJIET]**	**02**
27	Describe heuristic function for the travelling salesaman problem. **[New](May-2018)[LJIET]**	**03**
28	Discuss with example: Constraint satisfaction problem. **[New](May-2018)[LJIET]**	**03**
29	Differentiate Hill climbing and Best First Search method. **[New](Nov-2018)[LJIET]**	**03**
30	Discuss A* algorithm. Compare it with hill climbing search method. **(May-2019)[LJIET]**	**07**
31	What is heuristic function? Discuss with an example. **[New](May-2019)[LJIET]**	**04**
32	Explain how a problem can be analyzed based on its characteristics. Analyze the game of "8-Puzzle" based on these characteristics. **[New](Nov-2019)[LJIET]**	**07**
33	What is meant by "control strategy"? State the requirements of a good control strategy. **[New](Nov-2019)[LJIET]**	**03**
34	Explain the algorithm for Steepest-Ascent Hill Climbing. Briefly describe the situations in which hill climbing may fail to find a solution. **[New](Nov-2019)[LJIET]**	**07**
35	What is a heuristic? What care should you take while designing a heuristic function? **[New](Nov-2019)[LJIET]**	**03**
36	Explain Problem Reduction using "AND-OR" graph. **[New](Nov-2019)[LJIET]**	**04**
37	Take any instance of 8 Puzzle problem and show its solution with A* algorithm.**(Oct-2020)[LJIET]**	**07**
38	Which of the following mentioned properties are valid for a Crypt arithmetic problem?**[LJIET]** i) A number 0-9 is assigned to a particular alphabet.	**01**

	ii) Each different alphabet has a unique number. iii) All the same alphabets have the same numbers. iv) The numbers should satisfy all the operations that any normal number does. a) Only iv b) Only ii c) Only ii & iii d) All i,ii,iii and iv e) Only iii and iv f) Only i **Ans. All i,ii,iii and iv**	
39	Which statement is correct for steepest ascent hill climbing?**[LJIET]** Objective function is used in steepest ascent hill climbing. Heuristic function cannot be applied in steepest ascent. Feedback path is not provided in steepest ascent. It compares parent state and new state only. It compares parent state, new state and all neighboring nodes at specific level. All of the mentioned **Ans. It compares parent state, new state and all neighboring nodes at specific level.**	**01**
40	Crypt arithmetic problem is spanned under which heuristic technique?**[LJIET]** Problem reduction Constraint satisfaction Best First search Generate and Test Hill climbing Means ends analysis **Ans. Constraint satisfaction**	**01**
41	OR graphs is employed by ____ heuristic technique.**[LJIET]** Problem reduction Simulated annealing Best First search Generate and Test Hill climbing Means ends analysis **Ans. Best First search**	**01**
42	Theorem proving comes under _____ class of problem..**[LJIET]** Recoverable Ignorable Irrecoverable Improvable Agreeable Provable **Ans. Ignorable**	**01**
43	Which is/are the correct pair in terms of simulated annealing?**[LJIET]** Valley descending-Objective function Hill climbing-Heuristic function OR graph-Best First search AND OR graph-Problem reduction Operator table-Means ends analysis **Ans. Valley descending-Objective function**	**01**
44	Which of the following is an incorrect statement according to means ends analysis? **[LJIET]**	**01**

	It can proceed search in forward manner. It can proceed search in backward manner. It uses difference table to analyse distance. It uses operator table to fetch an activity. Robot movement can be studied using means ends analysis. It employs branch & bound technique. **Ans. It employs branch & bound technique.**	
45	Quick sort employs _____**[LJIET]** OR graphs**[LJIET]** AND-OR graphs Binary search tree Complete binary tree B-tree B+-tree **Ans. AND-OR graphs**	**01**
46	Which of the following property is not valid for knowledge? **[LJIET]** It is voluminous. It is available in vast amount. It is hard to characterize accurately. It is constantly changing. It is limited. All of the mentioned **Ans. It is limited.**	**01**
47	Discuss the concept of "Heuristic" with an example.**(Oct-2020)[LJIET]**	**03**
48	How do you compare Hill climbing technique with A* algorithm.**(Oct-2020)[LJIET]**	**04**
49	Discuss Best first search technique.**(Oct-2020)[LJIET]**	**07**
50	What are the primary problems with Hill climbing? Discuss.**(Oct-2020)[LJIET]**	**04**
	NUMERICALS	
1	Solve the following Cryptarithmetic Problem.**(May-2012)[LJIET]** S E N D + M O R E M O N E Y	**07**
2	Solve the following Cryptarithmetic Problem. **(May-2013)[LJIET]** B E S T + M A D E M A S E R	**07**
3	Solve The following Crypt arithmetic problem: **(Sep-2013)(May-2016)(May-2018)(Nov-2019) [LJIET]** C R O S S + R O A D S ---------- D E N G E R Solve the Crypt – arithmetic problem with the following constraints. Give solution steps.**(Oct-2016) [LJIET]** Constraints :- (i) Use decimal arithmetic (ii) No two letters possess same digit. C R O S S + R O A D S ---------- D E N G E R	**07, 07,07,07 ,07**
4	Solve The following Crypt arithmetic problem: **(Sep-2013)(May-2016)[LJIET]**	**07, 07**

	B A S E + B A L L ---------- G A M E S	
5	Solve the following Crypt Arithmetic problem.**(Nov-2014) [LJIET]** DONALD + GERALD ROBERT	**07**
6	Solve following cryptarithmetic problem with appropriate strategy/steps:**(Dec-2015) (May-2019) [LJIET]** E A T + T H A T ---------- A P P L E	**07,07**
7	Solve following cryptarithmetic problem with appropriate strategy/steps: **[LJIET]** T W O + T W O ---------- F O U R	**07**
8	Solve following cryptarithmetic problem with appropriate strategy/steps: **[LJIET]** O D D + O D D ---------- E V E N	**07**
9	Solve the following cryptarithmetic problem. Every letter must be assigned unique digit between 0 to 9.**(Oct-2020)[LJIET]** W I R E + M O R E M O N E Y	**07**
	CHAPTER NO - 3 : Knowledge Representation Issues:	
	TOPIC:1 Representation and mappings , Approaches to knowledge representation	
1	Explain the different issues in Knowledge representation.**(Nov-2014)(May-2016)(Nov-2018) [LJIET]**	**07,07,07**
2	Explain the different approaches to knowledge representation.**(Sep-2013)(May-2015) [NEW](Nov-2018)[LJIET]**	**07,07**
3	Explain the different approaches to knowledge representation. **[NEW](Nov-2018)[LJIET]**	**04**
4	What is knowledge representation in AI? **[LJIET]**	**05**
5	Explain the properties that a good knowledge representation system should possess.**(May-2017)(Nov-2018) [LJIET]**	**07,07**
6	Explain with example how choosing the granularity of representation and finding the right structure are crucial issues in knowledge representation? **([New](May-2018), [New](May-2019))[LJIET]**	**07, 07**
7	Explain why it is necessary to choose appropriate 'granularity' for knowledge representation. **[New](Nov-2019)[LJIET]**	**03**
8	_____ is the purpose for representation and mapping of facts.**[LJIET]** A) To use it in an efficient manner. B) To derive a useful fact from given facts. C) To answer a question from given facts. D) Only A & B E) Only B & C	**01**

	F) All A, B and C **Ans. All A, B and C**	
9	_____ Property of good knowledge representation system denotes how efficiently inserting new information to knowledge base.**[LJIET]** Representational adequacy Inferential adequacy Inferential efficiency Distributive efficiency Acquisitional efficiency All of the mentioned **Ans. Acquisitional efficiency**	**01**
	TOPIC:2 Representation simple facts in logic, Representing instance and is-a relationships	
1	Explain inference rules in propositional calculus.**(Oct-2012)(Nov-2017)(Nov-2018) [New](Jan-2021)[LJIET]** Explain proposition calculus. **(May-2018) (Nov-2019) [LJIET]**	**05, 07,07,07 ,07,07**
2	What are the limitations of Propositional Logic? Explain how they can be overcome using Predicate logic. **(May-2017) [LJIET]**	**07**
3	What is wrong with the following arguments? • Men are widely distributed over the earth • Socrates is a man. • Therefore, Socrates is widely distributed over the earth. How should the facts represented by these sentences be represented in logic so that this problem does not arise?**(Oct-2016, [New](Nov-2017), [New](May-2019)) [LJIET]**	**07, 07, 07**
4	Explain Is-a relationship. **[LJIET]**	**02**
5	How to represent simple facts in logic? **[LJIET]**	**07**
6	Explain Property Inheritance algorithm with example.**[New](April-2017)[LJIET]**	**07**
7	Differentiate with example representation of "Instance" and "Isa" relationships. **[New](May-2018)[LJIET]**	**07**
8	Differentiate with example representation of "Instance" and "Isa" relationships. **[New](May-2019)[LJIET]**	**04**
9	Is-a relationship indicates _____.**[LJIET]** Class derivation Class provision Class membership Class amendment Class inclusion Class exclusion **Ans. Class inclusion**	**01**
10	Identify correct statement from following regarding to property inheritance: **[LJIET]** If we go from bottom to top, level of abstraction decreases. If we go from bottom to top, level of abstraction increases. Property inheritance has no concern with abstraction. If we go from bottom to top, we reach to more special class. If we go from bottom to top, level of abstraction remains constant. All of the mentioned **Ans. All of the mentioned**	**01**
11	Which statement is true in terms of preposition logic. **[LJIET]** A) It fails to capture individual relationship between object and class.	**01**

	B) It cannot specify quantification. C) It cannot distinguish between simple fact and fact with more than one objects. D) Only A & B E) Only B & C F) All A,B & C are true **Ans. All A,B & C are true**	
12	Instance and is-a relationships can convert from _____ predicate to _____ predicate. **[LJIET]** Binary, Unary Unary, Binary Unary, Tertiary Binary, Primary Tertiary, Primary Primary, Unary **Ans. Unary, Binary**	**01**
13	All pompeians died when volcano erupted in 79A.D. **[LJIET]** $Erupted(volcano,79) \wedge [\forall x: pompeian(x) \rightarrow died(x,79)]$ $[\forall x: pompeian(x) \wedge died(x,79)] \wedge Erupted(volcano,79)$ $Erupted(volcano,79) \vee [\forall x: pompeian(x) \wedge died(x,79)]$ $Erupted(volcano,79) \wedge [\forall x: pompeian(x) \vee died(x,79)]$ $Erupted(volcano,79) \rightarrow [\forall x: pompeian(x) \wedge died(x,79)]$ $[\forall x: pompeian(x) \wedge died(x,79)] \vee Erupted(volcano,79)$ **Ans.** $\boldsymbol{Erupted(volcano,79) \wedge [\forall x: pompeian(x) \rightarrow died(x,79)]}$	**01**
14	Define Propositional and predicate logic.**(Oct-2020)[LJIET]**	**03**
	TOPIC:3 Computable functions and predicates, Resolution	
1	Describe following facts into predicate logic. 1. Every child loves Santa. 2. Everyone who loves Santa loves any reindeer. 3. Rudolph is a reindeer, and Rudolph has a red nose. 4. Anything which has a red nose is weird or is a clown. 5. No reindeer is a clown. 6. Scrooge does not love anything which is weird. **[New](April-2017)[LJIET]**	**07**
2	Assume the following facts : • John likes all kinds of food. • Apples are food. • Chicken is food. • Anything anyone eats and isn't killed by is food. • Bill eats peanuts and is still alive. • Sue eats everything Bill eats. - Translate these sentences into formulas in Predicate logic - Prove that John likes peanuts using backward chaining. **(May-2013) [LJIET]**	**07**

3	Consider the following sentences and Answer a,b,c given below: 1. Rama likes all kinds of vegetarian food. 2. Oranges are food. 3. Mutton is food. 4. Anything anyone eats and is not killed by is food. 5. Likex eats peanuts and is still alive. 6. Lovex eats everything Likex eats. (a) Translate these sentences into formulas in Predicate Logic. (b) Prove that Rama likes peanuts using Backward Chaining. (c) Prove Rama likes peanuts using Resolution. **(Oct-2012) [LJIET]**	**09**
4	Consider the following facts. 1. The member of the St. Bridge club are Joe,Sally,Bill and Ellen. 2. Joe is married to Sally. 3. Bill is Ellen's brother. 4. The spouse of every married person in the club is also in the club. 5. The last meeting of the club was at Joe's house. 1) Translate the above sentences into formulas in predicate logic. 2) Prove that Ellen is not married. **(Nov-2014) [LJIET]**	**07**
5	Consider the following sentences: • Prince is a mega star. • Mega stars are rich. • Rich people have fast cars. • Fast cars consume a lot of petrol. (1) Translate these sentences into formulas in predicate logic. (2) Prove that Prince's car consumes a lot of petrol.**(Sep-2013) [LJIET]**	**07**
6	Represent following statements in Predicate Logic. 1. Raju only likes to see Hindi movies. 2. It is safe to assume a movie is American unless explicitly told otherwise. 3. The playhouse rarely shows foreign films. 4. People do not do things that will cause them to be in situations they do not like. 5. Rama does not go to the playhouse very often.**(Nov-2017) [LJIET]**	**07**
7	Translate these sentences into formulas in predicate logic. 1. John likes all kinds of food. 2. Apples are food. 3. Chicken is food. 4. Anything anyone eats and isn't killed-by is food. 5. Bill eats peanuts and is still alive. 6. Sue eats everything Bill eats.**(May-2014) [LJIET]**	**07**
8	Convert the formulas derived in Q-8 into clauses. Prove that John likes peanuts using resolution. **(May-2014) [LJIET]**	**07**
9	Explain the steps of unification in predicate logic. Also discuss the steps of converting predicate logic wffs to clause form. **(May-2015) [LJIET]**	**07**
10	Consider the following sentences: 1. Raj likes all kinds of food. 2. Apples are food. 3. Anything anyone eats and isn't killed by is food. 4. Sachin eats peanuts and is still alive. 5. Vinod eats everything Sachin eats. Now, attempt following: i. Translate these sentences into formulas in predicate logic. ii. Use resolution to answer the question, "What food does Vinod eat?" **(Oct-**	**07, 07**

	2016)[New](Nov-2017)[LJIET]	
11	Consider the following sentences: • Tennis is a game. • Chess is a game. • John and Steve are students. • John plays Tennis. • Steve plays everything that John plays. • Students who play Tennis, do not play Chess. (i) Translate the above sentences into formulas in Predicate logic (ii) Prove using resolution that "Steve does not play Chess"**(May-2017)(May-2018-NEW)[LJIET]**	**07,07**
12	Assume the following facts : • Steve only likes easy courses. • Science courses are hard. • All the courses in the basketweaving department are easy. • BK301 is a basketweaving course. Use Resolution to answer the question, "What Course would Steve like?" **(May-2012) [LJIET]**	**07**
13	Consider the following axioms: 1. Anyone whom Mary loves is a football star. 2. Any student who does not pass does not play. 3. John is a student. 4. Any student who does not study does not pass. 5. Anyone who does not play is not a football star. Prove using resolution process that "If John does not study, then Mary does not love John". **(May-2015)(Dec-2015) (May-2016) [LJIET]**	**07, 07, 07**
14	Consider following facts. 1. Every child loves Santa. 2. Every child loves every candy. 3. Anyone who loves some candy is not a nutrition fanatic. 4. Anyone who eats any pumpkin is a nutrition fanatic. 5. Anyone who buys any pumpkin either carves it or eats it. 6. John buys a pumpkin. 7. Lifesavers is a candy. Use resolution and prove: If John is a child, then John carves some pumpkin. **[New] (April-2017)[LJIET]**	**07**
15	Explain the algorithm of predicate logic resolution.**(Sep-2013)(Nov-2014)(Nov-2018) [LJIET]** Explain resolution in predicate logic. **[New](Nov-2018)[LJIET]** **OR** Explain the algorithm of predicate logic resolution. **(May-2019)[LJIET]**	**07,07,07 , 07,07**
16	Explain following terms in reference to predicate logic Resolution. a. Unsuccessful attempt at resolution b. Equality c. Reduce d. Trying several substitute **[New](May-2018)[LJIET]**	**07**
17	Explain the procedure to convert well formed formula to clause form with the help of example.**[New](Nov-2018)[LJIET]**	**07**
18	Consider the following facts:	**07**

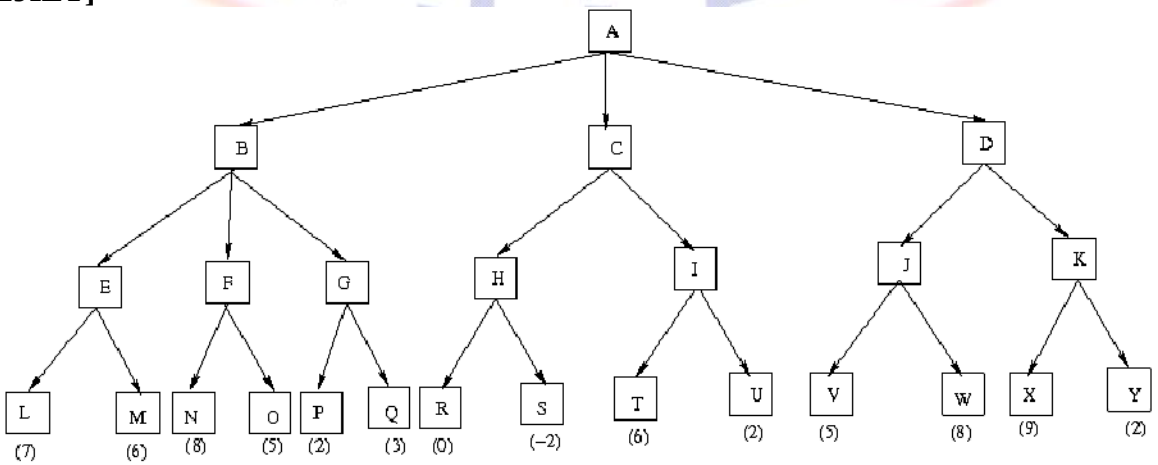
	• Raghu likes all kinds of food. • Mangoes are fruit. • Cabbage is not fruit. • All fruits are food. Represent the above facts using Predicate Logic and use Resolution to prove that "Raghu likes Mangoes" **[New](Nov-2019)[LJIET]**	
19	Define unification. **[New](Jan-2021)[LJIET]**	**03**
20	Resolution works on the principle of _____**[LJIET]** Substitution Regulation Refutation Negation Specification Contradiction **Ans. Refutation**	**01**
21	What is the purpose of converting given predicate statement into clause form in resolution? **[LJIET]** To eliminate entire predicate statement. To convert from proposition logic to predicate logic. To convert from predicate logic to proposition logic. To eliminate quantifiers and inference. To eliminate conjunction symbols. To eliminate disjunction symbols **Ans. To eliminate quantifiers and inference.**	**01**
22	Convert given statement in WFF. "Anything anyone eats and is not killed by is food."**[LJIET]** $\forall x: \forall y: eats(x,y) \wedge \neg killedby(y) \rightarrow food(y)$ $\forall x: \forall y: eats(x,y) \vee \neg killedby(y) \rightarrow food(y)$ $\forall x: \forall y: food(y) \rightarrow eats(x,y) \wedge \neg killedby(y)$ $\forall x: \forall y: eats(x,y) \wedge \neg killedby(x) \rightarrow food(y)$ $\forall x: \forall y: food(y) \rightarrow eats(x,y) \vee \neg killedby(y)$ $\forall x: \forall y: eats(x,y) \rightarrow food(y)$ **Ans.** $\boldsymbol{\forall x: \forall y: eats(x,y) \wedge \neg killedby(y) \rightarrow food(y)}$	**01**
23	A Horn clause is a clause that has at most one _____ literal. **[LJIET]** Negative Positive Inference Equal Processed Free	**01**

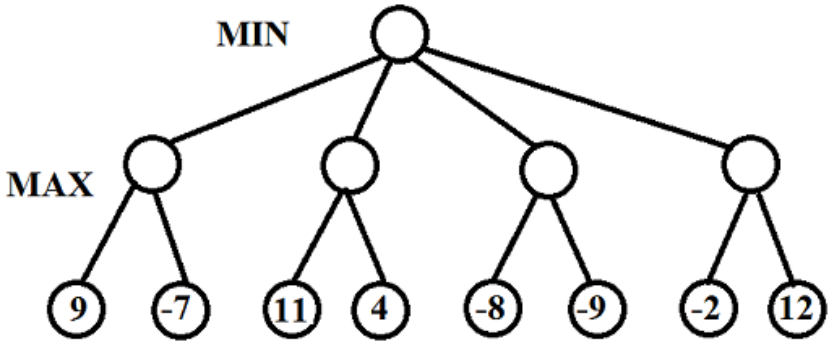
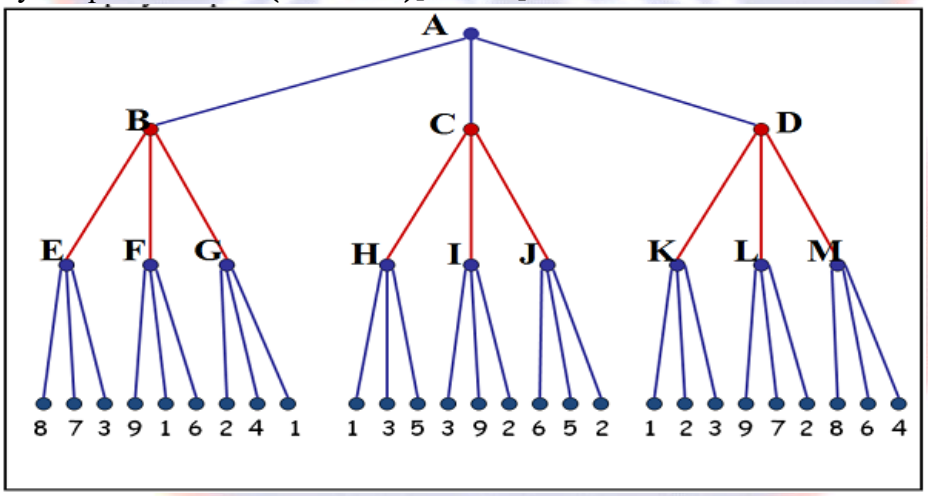
	Ans. Positive	
24	Represent the following sentences in first-order logic**(Oct-2020)[LJIET]** 1. Some students took English subject. 2. Every student who takes English passes it. 3. Every person who buyes policy is a smart. 4. No person buyes an expensive policy.	**04**
	TOPIC:4 Procedural versus declarative knowledge, Logic programming	
1	Differentiate between declarative and procedural representation of knowledge.**(May-2014)[New](Nov-2018)[LJIET]**	**02,03**
2	Briefly discuss Declarative and procedural knowledge.**(Oct-2020)[LJIET]**	**03**
	TOPIC:5 Forward versus backward reasoning	
1	Explain the forward and backward reasoning.**(May-2012)(May-2016)(May-2018)(Nov-2018)(Nov-2019) [LJIET]** Explain difference between forwards reasoning and backward reasoning.**[New](April-2017)[New](Nov-2017)[LJIET]** Explain forward and backward reasoning in detail with suitable examples of each.**(May-2015) [LJIET]** Explain difference between forwards reasoning and backward reasoning. .**(May-2019) [LJIET]**	**07,07,07, 07, 07, 07, 07,07,07**
2	Using formulas derived in Q-8 in topic-2 of chapter-4, prove John likes peanuts using forward chaining as well as backward chaining.**(May-2014) [LJIET]**	**07**
3	Justify using an example that PROLOG uses backward chaining to prove or answer any given goal. **(May-2014)[New](Nov-2018)[LJIET]**	**02,04**
4	Describe any one conflict resolution approach used in rule based systems.**(May-2014)[LJIET]**	**03**
5	Compare Forward versus Backward Reasoning. Explain how Prolog uses backward reasoning to reach a solution.**(May-2017) [LJIET]**	**07**
6	Differentiate between Forward Reasoning and Backward Reasoning.**[New](Nov-2019)[LJIET]**	**04**
7	_____ is the average no. of nodes that can be reached directly from single node. **[LJIET]** Causing factor Divisional factor Primary factor Null factor Branching factor Multiplicative factor **Ans. Branching factor**	**01**
	CHAPTER NO - 4 : Symbolic Reasoning Under Uncertainty:	
	TOPIC:1 Introduction to non-monotonic reasoning, Logics for non-monotonic reasoning	
1	Explain the non-monotonic reasoning. **(May-2012)(May-2016)[LJIET]** Explain the non-monotonic reasoning in detail. **(Dec-2015) (Oct-2016)[New](April-2017)** What is non-monotonic reasoning. **(May-2013) [LJIET]** Explain non-monotonic reasoning in detail **(May-2019)(Nov-2019)[LJIET]**	**07, 07, 07, 07, 07, 07, 07, 07**
2	Explain the non-monotonic reasoning. **[New](Nov-2017)[LJIET]** Discuss non-monotonic reasoning.**([New](May-2018), [New](May-2019))[LJIET]** Write a note on non-monotonic reasoning. **[New](Nov-2019)[LJIET]**	**04, 03, 03, 04**
3	Explain abductive reasoning using example.**(May-2014) [LJIET]**	**02**

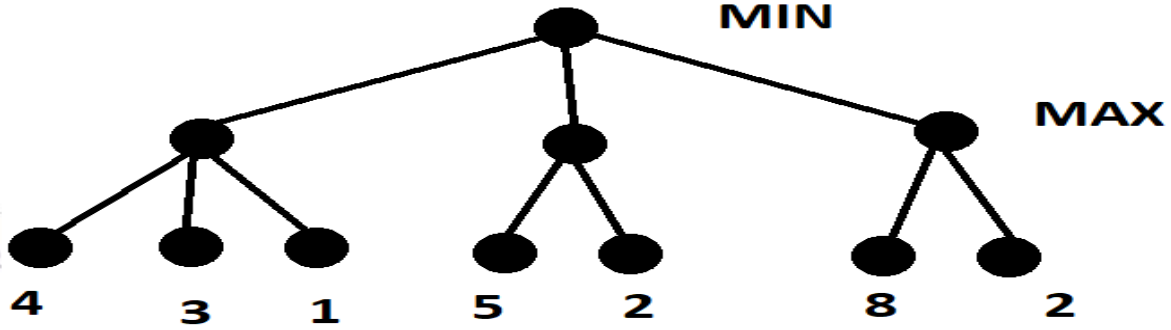
4	Explain non monotonic reasoning and discuss the logics for non-monotonic reasoning. **(Sep-2013)[LJIET]**	**07**
5	What is non-monotonic reasoning? Explain different subtypes of non monotonic reasoning.**(May-2015) [LJIET]** **OR** Explain non-monotonic reasoning in detail. **(Dec-2015) [LJIET]** **OR** Explain non monotonic reasoning. **(May-2016) [LJIET]**	**07, 07, 07**
6	What is non-monotonic reasoning? Briefly explain the key issues addressed by non-monotonic reasoning systems.**(May-2017) [LJIET]**	**07**
7	Differentiate Monotonic and Non monotonic reasoning. **[New](Nov-2018)[LJIET]**	**04**
8	List out the property of Monotonic and Non monotonic reasoning.**(Oct-2020)[LJIET]**	**04**
	CHAPTER NO - 7 : Probabilistic Reasoning::	
	TOPIC:1 Probability and Bays' Theorem, Certainty factors and Rule-Based Systems	
1	Explain probability and Bay's theorem.**(May-2013)(Nov-2017)[LJIET]**	**07, 07**
2	Discuss Bay's theorem.**[New](Nov-2017)[New](Nov-2018)[New](Jan-2021)[LJIET]**	**03,04,04**
3	State the Bayes' theorem. Illustrate how a Bayesian Network can be used to represent causality relationship among attributes.**(May-2017) [LJIET]**	**07**
4	Define 'certainty factor'. How does certainty factor help in dealing with uncertainty? Explain with reference to rule based system.**(May-2015) [LJIET]**	**07**
5	For given following joint probability distribution of two Boolean variables, Find out the following probabilities**?(Oct-2020)[LJIET]** (i) P(Cavity) (ii) P(~Toothache) (iii) P(Cavity|Toothache)	**07**

	Toothache	~Toothache
Cavity	0.04	0.06
~Cavity	0.01	0.89

	TOPIC:2 Bayesian Networks, Dempster-Shafer Theory, Fuzzy logic	
1	Explain the Bayesian networks.**(May-2012)(May-2013)(May-2014)[LJIET]** Explain Bayesian Network in detail.**(Dec-2015)[New](April-2017)[LJIET]**	**07, 07,07, 07**
2	Discuss Bayesian network and its applications.**[New](May-2018), [New](May-2019)) [LJIET]**	**04, 04**
3	Discuss following: i. Bayesian network ii. Fuzzy logic **(Oct-2016)[LJIET]**	**07**
4	What do you understand by the term Fuzzy Logic? How is a fuzzy set denoted mathematically?**[New](April-2017) [LJIET]**	**07**
5	Compare Fuzzy Vs Crisp logic and their membership function. **[New](Nov-2017)[New](May-2018)[LJIET]**	**04, 03**
6	Discuss various defuzzification methods. **([New](May-2018), [New](May-2019)) [LJIET]**	**04**
7	Differentiate Fuzzy logic and Crisp logic. Also describe set operations on fuzzy and crisp logic. **[New](May-2019)[LJIET]**	**07**

8	What is Soft Computing? **[New](May-2019)[LJIET]**	**03**
9	Explain probabilistic inference in Bayesian Networks with the help of a suitable example. **[New](Nov-2019)[LJIET]**	**04**
10	Explain the difference between Boolean and Fuzzy Set membership using a suitable example. **[New](Nov-2019)[New](Jan-2021)[LJIET]**	**03, 03**
11	What is the importance of Fuzzy logic? How do you perform union, intersection and complement operation on the Fuzzy sets?**(Oct-2020)[LJIET]**	**04**
	CHAPTER NO - 8 : Game Playing: Overview, and Example Domain :	
	TOPIC:1 Overview, Mini-Max Search Procedure, Alpha-Beta Cut-offs, Refinements, Iterative deepening	
	DESCRIPTIVE QUESTIONS	
1	Explain the Alpha-Beta Cutoffs Procedure in Game Playing.**(May-2012) [New](Nov-2018)[LJIET]**	**07**
2	Explain the Alpha-Beta Cutoffs Procedure in Game Playing. **[New](Nov-2018)[LJIET]**	**04**
3	Explain alpha-beta cut off search with an example. State a case when to do alpha pruning.**[New](Nov-2017)[New](Jan-2021)[LJIET]**	**07**
4	Explain Minmax procedure for game playing with any example. **(Oct-2012)[LJIET]** Explain Game Playing using the Minimax Procedure. **(May-2017)(May-2018)[LJIET]** Explain Min-Max search procedure with an example.**(Dec-2015)(Nov-2017)[LJIET]** Explain the Minimax Procedure with example.**(May-2013)[LJIET]** Explain Min-Max Search with example. **(Nov-2019)[LJIET]** Discuss min-max search method with an example. .**[New](May-2019)[LJIET]**	**07,07,07 ,07, 07, 07 ,07, 07**
5	Discuss Min-Max search method.**[New](Nov-2017)[LJIET]** Explain Min Max procedure in game playing.**[New](Nov-2018)[New](Jan-2021)[LJIET]**	**03,03,07**
6	Consider the game tree of Fig. 1 in which the static scores are from first player's point of view. Suppose the first player is maximizing player. Applying mini-max search, show the backed-up values in the tree. What move will the MAX choose? If the nodes are expanded from left to right, what nodes would not be visited using alpha-beta pruning.**(May-2014) [LJIET]**  Fig. 1	**07**
7	We have two players: MIN who plays first and can make 4 moves, MAX who plays second and can make 2 moves. Suppose that after 1 turn, the values of the leaves are as in the figure	**07**

	 Compute (with the algorithm minimax) the value of the root of the tree, than say which is the most convenient move for MIN. Then tell with the reason, which parts of the tree are not generated if we perform an alpha-beta pruning.**[New](April-2017)[LJIET]**	
8	'Minimax is not good for game playing when the opponent is not playing optimally.' Justify using suitable example.**(May-2014)[LJIET]**	**02**
9	Consider the following 2 player game tree in which static scores are given from the first player's point of view:**(Oct-2016)[LJIET]**  Suppose the first player is the maximizing player. What move should be chosen? Why? Use Mini-Max search to solve.Also explain limitations of Mini-Max search. How to overcome them?	**07**
10	Discuss Iterative Deepening Search. Also give one example to explain.**[New](Nov-2017)[LJIET]** Explain Iterative deepening. **[LJIET]**	**07, 07**
11	Discuss Iterative deepening search method. **[New](May-2019)[LJIET]**	**03**
12	What is "iterative deepening"? How is it useful in time constrained search? **[New](Nov-2019)[LJIET]**	**03**
13	Explain Depth First Iterative deepening with Example. **[LJIET]**	**07**
14	Explain Iterative deepening-A* with Example. **[LJIET]**	**07**
15	Consider the game tree given in Fig. 1, in which the evaluation function values are shown below each leaf node for the max player. Assume that the root node corresponds to the minimizing player. Assume that the search always visits children left-to-right.	**03**

	 Compute the backed-up values computed by the minimax algorithm by writing values at the appropriate nodes in the tree given. **[New](May-2018)[LJIET]**	
16	For the game tree given in Q-11, which nodes will not be examined by the alpha-beta pruning algorithm? Show the process of alpha-beta pruning to justify your answer. **[New](May-2018)[LJIET]**	**04**
17	Discuss alpha-beta pruning and its advantages over min-max method. **(May-2019)[LJIET]**	**07**
18	Explain the MiniMax search procedure for Game Playing using suitable example. What is the significance of Alpha and Beta cut-offs? **[New](Nov-2019)[LJIET]**	**07**
19	Elaborate iterative deepening.**(Oct-2020)[LJIET]**	**07**
20	Simulate the working of Tic-tac-toe problem with Minimax technique.**(Oct-2020)[LJIET]**	**07**
	CHAPTER NO - 7 : Planing:	
	TOPIC:1 The Blocks World, Components Of a Planning System, Goal Stack Planning, Nonlinear Planning Using Constraint Posting, Hierarchical Planning, Reactive Systems	
	DESCRIPTIVE QUESTIONS	
1	Explain Goal Stack planning using suitable example.**(May-2014)[LJIET]** Explain goal stack planning in detail.**(May-2015)[LJIET]**	**07, 07**
2	Discuss goal stack planning.**[New](Nov-2018)[LJIET]**	**04**
3	Explain components of planning system. **[LJIET]**	**07**
4	Discuss nonlinear planning using constraint posting with example. **([New](May-2018), [New](May-2019)) [LJIET]**	**07, 07**
	CHAPTER NO - 8 : Natural Language Processing :	
	TOPIC:1 Introduction, Syntactic Processing, Semantic Analysis, Semantic Analysis, Discourse And Pragmatic Processing, Spell Checking	
	DESCRIPTIVE QUESTIONS	
1	Describe the various steps of Natural language Processing. **(May-2012)(May-2018-NEW)[LJIET]** Explain steps of Natural language Processing. **(May-2018) (Nov-2019)[New](Jan-2021)[LJIET]**	**07, 07,07,07 , 07**
2	What is Natural Language Processing? Explain each step of NLP.**(Oct-2012) (Nov-2018) [LJIET]**	**07,07**
3	Explain Semantic and Syntactic analysis in NLP**(May-2013)[NEW](Nov-2018)[LJIET]** Explain syntax and semantic analysis of natural language processing in detail.**[New](April-2017)[LJIET]**	**07, 07**
4	Explain Semantic and Syntactic analysis in NLP. **[NEW](Nov-2018)[LJIET]**	**03**
5	What is natural language processing? Explain the NLP steps in process. **(Sep-2013)[LJIET]**	**07**
6	List various components of natural language understanding process. Describe syntactic	**07**

	analysis and semantic analysis in brief. **(May-2014)[LJIET]**	
7	Explain each step of Natural Language Processing in detail. **(Dec-2015)[LJIET]** Explain steps of Natural Language Processing. **(Nov-2014)(May-2016)[New](Nov-2017)[LJIET]** Explain steps of Natural Language Processing in detail.**(Nov-2017)[LJIET]**	**07,07,07 , 07, 07**
8	Enlist the phases of natural language understanding. Describe the role of each phase in brief. **(May-2015)[LJIET]** Enlist and Explain various phases involved in Natural Language Processing **(Oct-2016) [LJIET]**	**07, 07**
9	What features of natural language make it difficult to process using computing systems? Enlist and briefly explain the steps in Natural Language Processing.**(May-2017)[LJIET]**	**07**
10	Explain each step of Natural Language Processing in detail. **(May-2019)[LJIET]**	**07**
11	Explain various steps of Natural Language Processing **[New](May-2019)[LJIET]**	**04**
12	Explain "Morphological Analysis" and "Syntax Analysis" in Natural Language Processing. **[New](Nov-2019)[LJIET]**	**04**
13	State the factors which may make understanding of natural language difficult for a computer. **[New](Nov-2019)[LJIET]**	**03**
14	Explain the following terms (i) Semantic Nets (ii) Frames **(Oct-2020)[LJIET]**	**03**
15	Define Natural language processing and explain Discourse and Pragmatic processing. **(Oct-2020)[LJIET]**	**07**
	CHAPTER NO -9 : Connectionist Models :	
	TOPIC:1 Introduction: Hopfield Network, Learning In Neural Network, Application Of Neural Networks, Recurrent Networks, Distributed Representations, Connectionist AI And Symbolic AI.	
	DESCRIPTIVE QUESTIONS	
1	Describe briefly the applications of Neural Networks.**(May-2012)(May-2013)[LJIET]** Write a short note on "Applications of Artificial Neural Networks".**(May-2017)[LJIET]** Explain applications of Artificial Neural Networks. **(May-2018) [LJIET]** List and explain applications of Artificial Neural Networks.**[New](Nov-2018)[LJIET]**	**07,07,07 , 07, 07**
2	Enlist some applications of Neural Networks.**[New](Nov-2019)[LJIET]**	**03**
3	Explain Artificial Neural Network in brief.**(Oct-2012)[LJIET]** Explain Artificial Neural Network**.(Nov-2014)(Nov-2017)(Nov-2019) [LJIET]**	**07, 07, 07,07**
4	Write a short note on: Hopfield Networks. **(Sep-2013)(May-2016)(Nov-2018) [LJIET]** Explain Hopfield networks. **(May-2014)[LJIET]**	**07,07, 07,07**
5	Explain Hopfield networks. **(May-2018-NEW)[LJIET]** What is Hopfield network?**[New](Nov-2017)[LJIET]** Explain Hopfield Network. **[New](May-2019)[LJIET]**	**04, 03, 04**
6	Write a short note on: Recurrent Networks. **(Sep-2013)[LJIET]**	**07**
7	Explain perceptron learning algorithm for training a neural network. What are the limitations of this algorithm? **(May-2015)[LJIET]** Discuss perceptron learning algorithm **(Dec-2015)[LJIET]** Discuss perceptron learning algorithm for training a neural network. Also discuss different activation functions **(Oct-2016)[LJIET]**	**07, 07, 07**
8	Discuss algorithm for perceptron learning.**[New](Nov-2017)[LJIET]** Discuss perceptron. **[New](May-2019)[LJIET]**	**03, 03**

9	What is linearly separable problem? Design a perceptron for any of such problem. State one example of a problem which is not a linearly separable.**(Dec-2015)[LJIET]**	**07**
10	Explain the algorithm for Backpropagation in Neural Networks.**(May-2012)[LJIET]**	**07**
11	Explain connectionist AI and Symbolic AI. **[LJIET]**	**07**
12	Explain connectionist models. What is perceptron? What is concept of back propagation for ANNs?**[New](April-2017)[LJIET]**	**07**
13	What is meant by perceptron? Give one example. **[New](May-2018)[LJIET]** What is meant by Perceptron? **[New](Jan-2021)[LJIET]**	**03, 03**
14	Differentiate Supervised and Unsupervised learning. **[New](Nov-2018)[LJIET]**	**03**
15	Discuss following with respect to Artificial Neural Network. i. Activation function ii. Weight iii. Baised input iv. axon **(May-2019)[LJIET]**	**07**
16	Discuss various features of Hopfield network. **(May-2019)[LJIET]**	**07**
17	Define epoch with respect to ANN. **[New](May-2019)[LJIET]**	**03**
18	What is learning? What are its types? **[New](Jan-2021)[LJIET]**	**03**
19	How do you define Artificial neural network? How does it learn? **(Oct-2020)[LJIET]**	**03**
20	What do you understand by classification in Neural Network? Briefly explain perceptron algorithm and also narrate its limitation. **(Oct-2020)[LJIET]**	**07**
	CHAPTER NO - 10 : Expert Systems:	
	TOPIC:1 Representing and Using Domain Knowledge, Expert System Shells, Explanation, Knowledge Acquisition.	
1	What are Expert Systems?**[LJIET]**	**03**
2	What are the characteristics of Expert Systems?**[LJIET]**	**04**
3	How knowledge is acquired in expert system? **[LJIET]**	**04**
	CHAPTER NO - 11 : Genetic Algorithms:	
	TOPIC:1 A Peek into the Biological World, Genetic Algorithms (GAs), Significance of the Genetic Operators, Termination Parameters.	
1	How genetic algorithms are used in Artificial Intelligence? **[LJIET]**	**07**
2	What will be the termination parameter for genetic algorithm? **[LJIET]**	**03**
	CHAPTER NO - 12 : Introduction to Prolog:	
	TOPIC:1 Introduction, Converting English to Prolog Facts and Rules, Goals, Prolog Terminology, Variables, Control Structures, Arithmetic Operators, Matching in Prolog, Backtracking, Cuts, Recursion, Lists.	
1	Demonstrate the use of cut and fail predicates in Prolog with example.**(May-2012)[LJIET]** What is use of cut and fail predicates in Prolog with example.**(Nov-2017)[LJIET]**	**07, 07**
2	What are the Applications, Features and Limitations of Prolog? **(May-2012)[LJIET]**	**07**
3	Explain CUT, FAIL & REPEAT predicates in PROLOG.**(Oct-2012)(Dec-2015)(Nov-2018)[LJIET]**	**07,07, 07**
4	Write a Prolog program to solve Tower of Hanoi problem.**(Oct-2012)(May-2013)(Nov-2017)(Nov-2018)(Nov-2019) [LJIET]** Explain and write solution of Tower of Hanoi with PROLOG. **(May-2018) [LJIET]**	**07,07,07 , 07, 07, 07**
5	Write a Prolog program to count vowels in a list of characters.**(Oct-2012)(Nov-2018) [LJIET]**	**07,07**
6	Write a Prolog program to find sum of elements of a list.**(Oct-2012)[LJIET]** Write a prolog program to find sum of all the numbers of a list.**(Nov-2014)(May-2016)(May-**	**07,07, 07, 07, 07**

	2018)(Nov-2019) [LJIET]	
7	Write a prolog program to find the sum of first N natural numbers.**[New](Nov-2017) [LJIET]**	**04**
8	Demonstrate the use of Repeat Predicate in Prolog with example.**(May-2013)[LJIET]**	**07**
9	What is red cut and green cut in Prolog?**(May-2013) [LJIET]**	**07**
10	Discuss cut in prolog.**[New](May-2018)[LJIET]**	**03**
11	Write a Prolog program to find factorial of a given number.**(Sep-2013)(Dec-2015) (Oct-2016)[New][LJIET]**	**07, 07, 07**
12	Write a Prolog program to find factorial of a given number. **(Nov-2017)[LJIET]**	**04**
13	Write following prolog programs: (i) To find the sum of first n natural numbers. (ii) To append List2 to List1 and bind the result to List3.**[New](April-2017) [LJIET]**	**07**
14	Write following prolog programs: (i) To find the factorial of a positive integer number. (ii) To find the nth element of a given list.**[New](April-2017) [LJIET]**	**07**
15	Write a Prolog program to reverse a given list.**(Sep-2013)(Nov-2017)[LJIET]**	**07, 07**
16	Explain how list is used in Prolog. Discuss how following list functions can be implemented in Prolog. (1) Checking membership of an item in a given list (2) Concatenating two lists (3) Deleting an item in a given list.**(May-2014)(Oct-2016)[LJIET]**	**07, 07**
17	Explain cut and fail predicate with example.**(Nov-2014)(Oct-2016)[LJIET]** Discuss Cut and Fail in Prolog. **(May-2019) [LJIET]** Demonstrate the use of 'cut' and 'fail' predicates in Prolog with the help of a suitable example. **[New](Nov-2019)[LJIET]**	**07, 07, 07, 07**
18	Discuss cut and fail in prolog. **[New](Nov-2017)[LJIET]**	**04**
19	Write a prolog program to find maximum number from a list.**(Nov-2014)(May-2016)(May-2018) [LJIET]**	**07,07, 07**
20	Write a Prolog program for finding a set, which is result of the intersection of the two given sets. Hint: Goal: intersect([1, 2, 3], [2, 3, 4], A) A = [2, 3] Goal: intersect([d, f, g], [a, b, c], X) X = [] **(May-2015)[LJIET]**	**07**
21	Write a Prolog program to merge two sequentially ordered (ascending) lists into one ordered list. Hint: Goal: merge([1, 3, 5, 7], [0, 2, 4, 6], L) L = [0, 1, 2, 3, 4, 5, 6, 7] Goal: merge([a, c], [b, d], [a, b, c, d]) Yes **(May-2015)[LJIET]**	**07**
22	Write a Prolog program that verifies whether an input list is a palindrome. Hint: Goal: palindrome([r,a,c,e,c,a,r]) Output: Yes Goal: palindrome([a,b,c]) Output: No**(May-2017)[LJIET]**	**07**
23	Write a Prolog program to find: the last element and the nth element (where 'n' indicates position), of an input integer list. Hint: Goal: last_element([1, 2, 3, 8, 9], X) Output: X = 9 Goal: nth_element([1, 2, 3, 8, 9], 4, X) (Here, n = 4) Output: X = 8**(May-2017)[LJIET]**	**07**
24	Explain following terms with reference to Prolog programming language:	**07**

	Caluses, Predicates, Domains, Goals, Cut, Fail, Inference engine. **(May-2015)[LJIET]**	
25	Write a PROLOG program to find GCD of two numbers. **[New](May-2018)[LJIET]**	**04**
26	Write a PROLOG program Checking for Password. 1. Give an opportunity to user to re-enter the password 'n' no. of times, on entering wrong password using Repeat predicate. 2. Give an opportunity to user to re-enter the password three (03) times, on entering wrong password. **[New](May-2018)[LJIET]**	**07**
27	Explain following terms with reference to Prolog programming language: Clauses, Predicates, Domains, Goal, Cut, Fail, Inference engine**(May-2018) [LJIET]**	**07**
28	Explain following terms with reference to Prolog programming language: Clauses, Predicates, Domains **[New](Nov-2018)[LJIET]**	**03**
29	Discuss fail predicate in prolog. **[New](Nov-2018)[LJIET]** Discuss Fail in prolog. **[New](May-2019)[LJIET]**	**03, 03**
30	Discuss how the following list function can be implemented in Prolog. 1. Append 2. Reverse**[New](Nov-2018)[LJIET]**	**07**
31	Write a Prolog program to i. Merge two lists. ii. To check whether the number is +ve or -ve **(May-2019)[LJIET]**	**07**
32	Write a prolog program to check whether or not given number is positive. **[New](May-2019)[LJIET]**	**03**
33	Write a PROLOG program to count total occurrence of a character in a given list of characters. **[New](May-2019)[New](Jan-202)[LJIET]**	**04**
34	Write Prolog programs to perform the following: i) Find the last element of a list ii) Merge two sorted integer lists L1 and L2 to generate a final sorted list L3. (For example, if L1= [1,3] and L2=[2,5,8], then L3=[1,2,3,5,8]) **[New](Nov-2019)[LJIET]**	**07**
35	Discuss the concept of LIST in prolog with suitable example. **[New](Jan-2021) (Oct-2020)[LJIET]**	**04,03**
36	Write a prolog program which can list odd and even numbers from the given input list. **(Oct-2020)[LJIET]**	**04**
37	List out the few properties of Prolog programming. **(Oct-2020)[LJIET]**	**03**
38	What is the purpose of fail predicate in prolog? Show the purpose with an example. **(Oct-2020)[LJIET]**	**04**