

MCA DEPARTMENT



QUESTION BANK

For

Artificial Intelligence (18MCA211)

Regulation – R18

Academic Year 2019 – 20

Prepared by

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SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES.
(AUTONOMOUS)
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SUBJECT NAME : Artificial Intelligence

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UNIT I - Introduction		
What is AI? - The History of Artificial Intelligence - The State of the Art. Intelligent Agents: Agents & Environments - Structure of Agents. Solving Problems by Searching: Problem Solving Agents – Example Problems- Searching for Solutions.		
PART -A		
Q.No.	Questions	Blooms Taxonomy Competence
1	Define Artificial Intelligence.	Remembering
2	List out the four categories under which AI is classified	Analyzing
3	Identify the name of driverless car and first computer program to defeat the world champion in chess.	Applying
4	List out the characteristics of Intelligent agent.	Analyzing
5	How the agents will improve their performance?	Remembering
6	What measure will evaluate the behavior of the Agent in an environment.	Remembering
7	How to represent the environment of a problem.	Remembering
8	List the five components of a problem.	Analyzing
9	Define search.	Remembering
10	Compare the goal formulation and problem formulation.	Evaluating
UNIT II - Search Strategies		
Uninformed Search Strategies -Avoiding Repeated States. Informed Search and Exploration: Informed (Heuristic) Search Strategies - Heuristic Functions - Local Search Algorithms and Optimization Problems- Local Search in Continuous Spaces – Defining Constraint Satisfaction Problems- Constraint Propagation: Inference in CSPs.		
PART -A		
21	List out some of the uninformed search techniques.	Remembering
22	List out some of the informed search techniques.	Analyzing
23	Compare the access method in uninformed search and informed search.	Evaluating



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24	List the criterion used to compare the uninformed search strategies.	Analyzing																									
25	Define heuristic function.	Remembering																									
26	What kind of problems can be solvable using local search algorithms.	Remembering																									
27	Compare global minimum and global maximum.	Understanding																									
28	Define Genetic algorithm.	Remembering																									
29	What operations are used to generate new states in Genetic algorithm.	Remembering																									
30	Define Hessian matrix.	Remembering																									
PART - B																											
31	a) Compare the merits and demerits of Breadth-first search and Depth-first Search Algorithms. b) Compare the Uniform-cost search and Depth limited search.	Evaluating																									
32	Describe about the following in A* search algorithm a) Conditions for Optimality b) Optimality of A*	Understanding																									
33	Explain about Heuristic functions.	Evaluating																									
34	Identify the problems encountered during hill climbing and list how to solve these problems.	Applying																									
35	Discuss about Simulated annealing. Discuss about Genetic algorithms.	Creating																									
36	Consider the Travelling salesman problem with the following distances.	Evaluating																									
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	B		110	-	150	170																					
C	125	150	-	150																							
D	175	170	150	-																							
If the starting city is B, then find the path for minimum distance during a round trip using heuristic method.																											
37	Explain about local search in continuous spaces.	Understanding																									
38	Explain the Constraint Satisfaction Problems with suitable example.	Understanding																									
39	Consider the cryptarithmic problem shown below. The goal is a problem state where all letters have been assigned a digit in such a way that all the initial constraints are satisfied. Problem: <div style="text-align: center;"> S E N D + M O R E ----- M O N E Y </div> Initial state Constraints: No two letters have the same value. The sums of the digits must be as shown in the problem Explain the steps in detail to solve the problem using the Constraint satisfaction problem.	Evaluating																									
40	Explain about Inference in Constraint Satisfaction problems	Evaluating																									
UNIT- III - Knowledge and Reasoning																											
Logical Agents: Knowledge-Based Agent - The Wumpus World – Logic - Propositional Logic - a Very Simple Logic - Propositional Theorem Proving - Effective Propositional Model Checking - Agents Based on Propositional Logic. First Order Logic: Syntax and Semantic of First-Order Logic - Using First-Order Logic - Knowledge Engineering in First-Order Logic																											
PART – A																											
41	What is Knowledge base.	Remembering																									
42	What are the components of knowledge based agent.	Remembering																									



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43	Define sound.	Remembering
44	When we say m is a model of a sentence α .	Remembering
45	List the logical connectives.	Analyzing
46	Define satisfiability.	Remembering
47	List the natural reasoning algorithms for knowledge base in Horn form.	Analyzing
48	What are the types of Quantifiers in first order logic	Remembering
49	What is ground term.	Remembering
50	Compare the Assertions and Queries in first order logic.	Evaluating
PART -B		
51	Solve the Wumpus World problem.	Applying
52	Write function for the Knowledge based agent. Define the following terms in Logic. i) Model ii) entailment iii) completeness iv) model checking	Understanding
53	List the standard logical equivalences used in Propositional theorem proving. Discuss about Inference and proofs in Propositional theorem proving.	Analyzing Creating
54	Compare the Forward and Backward Chaining methods. Discuss about the current state of the world.	Evaluating Creating
55	Check whether each of the following sentences is valid, unsatisfiable or neither. Verify your decisions using equivalence rules Smoke \rightarrow smoke Smoke \rightarrow fire (smoke \rightarrow fire) \rightarrow (\neg smoke \rightarrow \neg fire) Smoke \vee fire \vee \neg fire Big \vee Dumb \vee (Big \rightarrow Dumb)	Applying
56	Discuss about Models for first order logic Discuss about symbols and interpretations in first order logic	Creating
57	Distinguish the atomic sentences and Complex sentences with suitable example. Compare the Universal quantification and Existential quantification.	Analyzing Understanding
58	Describe about Nested quantifiers in first order logic. Describe about equality in first order logic.	Understanding
59	Explain about Assertions and queries in first order logic.	Evaluating
60	Explain about Knowledge engineering in First-Order logic.	Evaluating
UNIT IV - Inference in First Order Logic		
Propositional Vs First Order Inference-Unification and Lifting-Forward Chaining-Backward Chaining-Resolution. Knowledge Representation: Ontological Engineering - Categories and Objects - Events-Reasoning Systems for Categories - Reasoning with Default Information - The Internet Shopping World.		
PART - A		
61	Differentiate Universal Instantiation and Existential Instantiation.	Analyzing
62	Define Unification.	Remembering
63	Identify the roles of STORE and FETCH functions.	Applying
64	Draw the subsumption lattice for the sentence Employs(John,John).	Creating



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65	What is Ontological Engineering.	Remembering
66	Identify the base for event calculus.	Applying
67	Give example for first order definite clauses.	Understanding
68	Write the Robert Kowalski's equation.	Understanding
69	Draw a semantic network with four objects.	Creating
70	Define Skolemization.	Remembering
PART –B		
71	a) Compare Propositional and First Order Inference b) Discuss about Unification.	Evaluating Creating
72	Explain about Processes and Time interval in Events.	Evaluating
73	a) Discuss about Physical composition in Categories and Objects. b) Discuss about Objects in Categories and Objects.	Creating
74	Explain about Forward-chaining algorithm.	Evaluating
75	Explain about Backward-chaining algorithm	Evaluating
76	a) Discuss about the resolution inference rule. b) Discuss about the Equality in Resolution.	Creating
77	a) Discuss about Semantic networks. b) Discuss about Description Logics.	Creating
78	Explain about Truth maintenance systems.	Evaluating
79	Explain about Ontological Engineering .	Evaluating
80	Explain about the Internet Shopping World.	Evaluating
UNIT V - UNIT V - Uncertain Knowledge, Reasoning and Learning		
<p>Quantifying Uncertainty: Acting Under Uncertainty - Basic Probability Notation - Inference Using Full Joint Distributions – Independence - Bayes' Rule and Its Use. Learning from Examples: Forms of Learning - Supervised Learning - Learning Decision Trees – Artificial Neural Networks- Support Vector Machines- Ensemble Learning-Practical Machine Learning.</p>		
PART – A		
81	List the types of learning.	Understanding
82	Differentiate supervised learning and unsupervised learning.	Analyzing
83	Draw a simple mathematical model of a neuron.	Evaluating
84	Find a model for Probability of any Proposition.	Evaluating
85	For any propositions a and b , determine P(a/b).	Evaluating
86	Define product rule in basic probability notation.	Remembering
87	Distinguish conditional and unconditional probabilities.	Analyzing
88	Define Bayes' rule.	Remembering
89	What is overfitting?	Remembering
90	Define Ockham's razor in supervised learning.	Remembering
PART –B		
91	Discuss about the language of propositions in probability assertions.	Creating
92	a) Discuss about the decision tree representation. (5M) b) Discuss about expressiveness of decision tree. (5M)	Creating
93	Explain about inducing decision trees from examples.	Evaluating
94	a) List the four major factors used to improve the components of an agent. (5M)	Remembering Creating



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	b) Discusses about types of learning. (5M)	
95	Discuss about choosing attribute tests for decision tree.	Creating
96	a) Describe about the Neural network structures b) Describe about single layer feed forward neural network.	Understanding
97	Explain about multi layer feed forward neural networks.	Evaluating
98	Explain about the Backpropagation algorithm for learning in multilayer networks.	Evaluating
99	Discuss about Support Vector Machines. Discuss about Ensemble Learning.	Creating
100	Apply machine learning to any two real life example and discuss it.	Applying