Printed Page:- Subject Code:- ACSAI0301

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: III - THEORY EXAMINATION (2021 - 2022) (ONLINE)

Subject: Introduction to Artificial Intelligence

Time: 02:00 Hours Max. Marks: 100

General Instructions:

1. *All questions are compulsory. It comprises of two Sections A and B.*

- *Section A - Question No- 1 has 35 objective type questions carrying 2 marks each.*
- *Section B - Question No- 2 has 12 subjective type questions carrying 3 marks each. You have to attempt any 10 out of 12 question.*
- *No sheet should be left blank. Any written material after a Blank sheet will not be evaluated/checked.*

SECTION A 35 x 2 = 70

1. Attempt ALL parts:-

1.1.a A technique that was developed to determine whether a machine could or could not demonstrate the artificial intelligence known as the 1

(a) Boolean Algebra
(b) Turing Test
(c) Logarithm
(d) Algorithm

1.1.b Which rule is applied for the Simple reflex agent? 1

(a) Simple-action rule
(b) Simple & Condition-action rule
(c) Condition-action rule
(d) None of the above

1.1.c The PEAS in the task environment is about 1

(a) Peer, Environment, Actuators, Sense
(b) Performance, Environment, Actuators, Sensors
(c) Perceiving, Environment, Actuators, Sensors
(d) None of the above

1.1.d The best AI agent is one which_____ 1

(a) Needs user inputs for solving any problem
(b) Can solve a problem on its own without any human intervention
(c) Need a similar exemplary problem in its knowledge base
(d) All of the above

1.1.e LISP was created by? 1

(a) John McCarthy
(b) Marvin Minsky
(c) Alan Turing
(d) Allen Newell and Herbert Simon

1.1.f DARPA, the agency that has funded a great deal of American Artificial Intelligence research, is part of the Department of _____ 1

(a) Defense

(b) Energy
(c) Education
(d) Justice

1.1.g What is Human Intelligence? 1

(a) Learning
(b) Perceiving
(c) Reasoning
(d) All of the Above

1.2.a Heuristic function of greedy best-first search denoted as _____. (CO2) 1

(a) f(n) != h(n)
(b) f(n) < h(n)
(c) f(n) = h(n)
(d) f(n) > h(n)

1.2.b A* algorithm is based on _____. (CO2) 1

(a) Depth-first search
(b) Breadth-first search
(c) Hill climbing search
(d) Best-First-Search

1.2.c uniform-cost search expands the node n with the _____ 1

(a) Lowest path cost
(b) Heuristic cost
(c) Highest path cost
(d) Average path cost

1.2.d The initial state and the legal moves for each side define the _____ for the game. 1

(a) Search Tree
(b) Game Tree
(c) State Space Search
(d) Forest

1.2.e What is the heuristic function of greedy best-first search? 1

(a) f(n) != h(n)
(b) f(n) < h(n)
(c) f(n) = h(n)
(d) f(n) > h(n)

1.2.f What is state space? 1

(a) The whole problem
(b) Your Definition to a problem
(c) Problem you design
(d) Representing your problem with variable and parameter

1.2.g What is the complexity of minimax algorithm? 1

(a) Same as of DFS
(b) Space – bm and time – bm
(c) Time – bm and space – bm
(d) None of the mentioned

1.3.a Which graph is used to represent semantic network? (CO3) 1

(a) Undirected graph
(b) Directed graph

(c) Directed Acyclic graph

(d) Directed complete graph

1.3.b … specifies the order in which the rules will be compared to the database. 1

(a) A set of rules

(b) A control strategy

(c) One or more knowledge

(d) A rule applier

1.3.c Which is not a property of representation of knowledge? 1

(a) Representational Verification

(b) Representational Adequacy

(c) Inferential Adequacy

(d) Inferential Efficiency

1.3.d What is transposition rule? 1

(a) From $p \rightarrow q$, infer $\sim q \rightarrow p$

(b) From $p \rightarrow q$, infer $q \rightarrow \sim p$

(c) From $p \rightarrow q$, infer $q \rightarrow p$

(d) From $p \rightarrow q$, infer $\sim q \rightarrow \sim p$

1.3.e ___ typically represent links between objects according to more rigid rules. 1

(a) Scripts

(b) Strong Slot and Filler Structures

(c) Semantic Nets

(d) Partitioned Semantic Networks

1.3.f ___ is an extension to Semantic nets that overcome a few problems or extend their expression of knowledge. 1

(a) Semantic networks

(b) Partitioned Semantic Networks

(c) Frame

(d) None of the above

1.3.g ___ is the ability to represent the required knowledge. 1

(a) Representational Adequacy

(b) Inferential Adequacy

(c) Acquisition Efficiency

(d) Inferential Efficiency

1.4.a Knowledge and reasoning also play a crucial role in dealing with _____ environment. 1

(a) Completely Observable

(b) Partially Observable

(c) Neither Completely nor Partially Observable

(d) Only Completely and Partially Observable

1.4.b Morphological Segmentation 1

(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

1.4.c The Bayesian network graph does not contain any cyclic graph. Hence, it is known as a 1

(a) DCG

(b) DAG
(c) CAG
(d) SAG

1.4.d Rule based system also known as 1

(a) Knowledge based system
(b) Mycin based system
(c) Human based system
(d) None of the above

1.4.e Which algorithm are in more similar to backward chaining algorithm? 1

(a) Depth-first search algorithm
(b) Breadth-first search algorithm
(c) Hill-climbing search algorithm
(d) All of the mentioned

1.4.f Which of the following is not a Capabilities of Expert Systems? 1

(a) Advising
(b) Demonstrating
(c) Explaining
(d) Expanding

1.4.g Which of the following is not a benefits of Expert Systems? 1

(a) Availability
(b) Speed
(c) Time
(d) Less Error Rate

1.5.a What are the composition for agents in artificial intelligence? 1

(a) Program
(b) Architecture
(c) Both Program and Architecture
(d) None of the above

1.5.b Which is used to improve the agents performance 1

(a) Perceiving
(b) Learning
(c) Observing
(d) None of the above

1.5.c State whether the following statements about the fuzzy logic are True or False. 1
i) The concept of fuzzy logic is extensively applied in business, finance, defense, etc.
ii) Unlike two-valued Boolean logic, fuzzy logic is multi-valued.

(a) i-True, ii-True
(b) i-True, ii-False
(c) i-False, ii-True
(d) i-False, ii-False

1.5.d … cannot represent vague concepts and therefore fails to give the answers on the inconsistencies. 1

(a) default logic
(b) Monotonic logic
(c) Non-Monotonic logic
(d) Fuzzy logic

1.5.e Monotonic Reasoning is a process in which 1

(a) A reasoning process that moves in one direction only
(b) The conclusions derived are valid deductions and they remain so.
(c) The number of facts in the knowledge base is always increasing
(d) All of the mentioned

1.5.f Reinforcement learning is- 1

(a) Supervised
(b) Unsupervised
(c) Reward based
(d) None of the above

1.5.g Which of the following does not include different learning methods 1

(a) Analogy
(b) Introduction
(c) Memorization
(d) Deduction

SECTION B 10 X 3 = 30

2. Answer any TEN of the following:-

2.1.a	How is machine learning related to AI?	2
2.1.b	What is Strong AI, and how is it different from the Weak AI?	2
2.2.a	A* algorithm is based on which search method? Explain.	2
2.2.b	Explain uninformed search in detail.	2
2.2.c	What is a heuristic function?	2
2.3.a	Find the truth table for $(P \rightarrow Q) \rightarrow ((P \rightarrow \sim Q) \rightarrow \sim P)$	2
2.3.b	Draw state space tree for 4 Queens Problem.	2
2.3.c	Explain AI Knowledge cycle.	2
2.4.a	Define Probabilistic Reasoning.	2
2.4.b	Which type of probability is used in Bayesian network? Explain in detail.	2
2.5.a	What is the role of actuator in agent?	2
2.5.b	What do you mean by Simulated Neural Networks?	2