

--Question Starting--

Match the following AI problem-solving approaches with their respective characteristics:

1. Approach Characteristic

I. Turing Test A. Uses a minimax algorithm to determine optimal moves

II. Rational Agent B. Designed to pass as human in a conversational context

III. Game Playing C. Evaluates choices based on performance measures

IV. State Space Representation D. Represents all possible states and transitions

Choose the correct answer from the options given below:

(1) I-B, II-C, III-A, IV-D

(2) I-C, II-A, III-D, IV-B

(3) I-C, II-B, III-D, IV-A

(4) I-A, II-D, III-B, IV-C

Answer Key: 1

Solution:

? Turing Test: Developed by Alan Turing, it tests a machine's ability to exhibit intelligent behavior indistinguishable from that of a human, primarily through conversation.

? Rational Agent: Operates under the principle of doing what is expected to maximize its performance measure, given its percept sequence and knowledge.

? Game Playing: In artificial intelligence, this involves strategic games like chess where algorithms predict the best moves, such as using minimax strategies.

? State Space Representation: Utilized in problem-solving by defining all possible states and the transitions between them, often visualized as a graph.

Hence, Option (1) is the right answer.

--Question Starting--

Match the following database system concepts with their appropriate descriptions:

1. Concept Description

I. Data Models A. Enables applications to access data without exposing details of data storage

II. Schemas B. Defines the logical structure of database objects

III. Three-Schema Architecture C. Defines how data is connected and processed within a system

IV. Data Independence D. Ability to change schema at one level without altering another level

Choose the correct answer from the options given below:

(1) I-C, II-B, III-A, IV-D

(2) I-A, II-D, III-B, IV-C

(3) I-B, II-C, III-D, IV-A

(4) I-D, II-A, III-C, IV-B

Answer Key: 1

Solution:

? Data Models: Conceptual tools that describe the structure, manipulation, and integrity aspects of data, focusing on the organization.

? Schemas: The blueprint of the database which defines how data is organized and how the relations among them are associated.

? Three-Schema Architecture: A framework that separates the user's view, the conceptual logic, and the storage of data to promote data abstraction and independence.

? Data Independence: The capacity to change the schema at one level of a database system without having to change the schema at another level.

Hence, Option (1) is the right answer.

--Question Starting--

Match the following database system components with their functionalities:

1. Component Functionality

I. DBMS A. Handles transactions, ensuring consistency and integrity

II. Client/Server Architecture B. Manages database access and provides a user interface

III. Database Languages C. Used for defining, manipulating, and querying data

IV. Interfaces D. Splits processing between client machines and servers

Choose the correct answer from the options given below:

(1) I-A, II-D, III-C, IV-B

(2) I-C, II-A, III-D, IV-B

(3) I-B, II-C, III-A, IV-D

(4) I-D, II-B, III-A, IV-C

Answer Key: 2

Solution:

? DBMS: The Database Management System manages the data, the database engine, and the database schema, facilitating transactions and ensuring data consistency.

? Client/Server Architecture: This model separates the database applications from the database data. The client requests services, and the server provides them, spreading out processing and operations.

? Database Languages: These include DDL (Data Definition Language), DML (Data Manipulation Language), and DQL (Data Query Language), each serving specific purposes in database interaction and manipulation.

? Interfaces: These provide tools and methods for users to interact with the database systems, including graphical and command-line interfaces.

Hence, Option (2) is the right answer.

--Question Starting--

Match the following concepts related to fuzzy logic systems with their descriptions:

1. Concept Description

I. Fuzzification A. Converts crisp input values to fuzzy values based on membership functions

II. Fuzzy Inference B. Applies logical operations on fuzzy sets to derive conclusions

III. Defuzzification C. Converts fuzzy output to a crisp output

IV. Fuzzy Control System D. Uses fuzzy logic for decision-making in controllers

Choose the correct answer from the options given below:

(1) I-A, II-B, III-C, IV-D

(2) I-C, II-A, III-D, IV-B

(3) I-B, II-C, III-A, IV-D

(4) I-D, II-B, III-C, IV-A

Answer Key: 3

Solution:

? Fuzzification: The process of transforming crisp values into degrees of membership for linguistic terms of fuzzy sets.

? Fuzzy Inference: The method by which fuzzy rules are applied to the fuzzy inputs to generate fuzzy outputs, using logical operations.

? Defuzzification: The conversion of a fuzzy output of the inference process into a crisp output, typically using methods like the centroid or the mean of maximum.

? Fuzzy Control System: Integrates fuzzy logic to handle the ambiguity and imprecision in input data, often used in various industrial and consumer product applications.

Hence, Option (3) is the right answer.