

--Question Starting--

Match the following learning types with their associated neural network models:

1. Learning Type Model

I. Supervised Learning A. Hopfield Network

II. Unsupervised Learning B. Single Perceptron

III. Reinforcement Learning C. Multi Layer Perceptron

IV. Competitive Learning D. Self Organizing Maps

Choose the correct answer from the options given below:

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

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

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

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

Answer Key: 2

Solution:

? Supervised Learning: Typically uses Multi Layer Perceptrons where the network is trained using a known set of inputs and outputs.

? Unsupervised Learning: Self Organizing Maps are a prime example where the network learns to classify input without external outputs.

? Reinforcement Learning: Typically associated with models like Q-learning that adjust actions based on rewards, not directly applicable to the given options but closest is Multi Layer Perceptron by elimination.

? Competitive Learning: Involves networks like Hopfield Networks where nodes compete to become active, forming part of memory and pattern recognition systems.

Hence, Option (2) is the right answer.

--Question Starting--

Match the following concepts in complexity theory with their appropriate explanations:

1. Concept Explanation

I. P Class Problems A. Problems where solutions can be verified quicker than they can be solved

II. NP Class Problems B. Problems solvable in polynomial time given a deterministic machine

III. NP-Completeness C. Subset of problems in NP that are as hard as any problem in NP

IV. Reducibility D. The ability to reduce one problem to another, demonstrating equivalency in computational difficulty

Choose the correct answer from the options given below:

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

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

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

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

Answer Key: 3

Solution:

? P Class Problems: Known for being solvable within a polynomial time frame on a deterministic machine.

? NP Class Problems: Characterized by the property that their solutions can be verified in polynomial time, even if finding the solution might be more complex.

? NP-Completeness: Represents a critical concept in computational theory where a problem in NP is also as hard as the hardest problems in NP.

? Reducibility: Important for proving NP-completeness, it involves showing that one problem can be transformed into another, preserving the computational challenge.

Hence, Option (3) is the right answer.

--Question Starting--

Match the following Internet technologies with their primary function:

1. Technology Function

I. DNS A. Transfers files between systems

II. SMTP B. Resolves domain names to IP addresses

III. FTP C. Manages email communications

IV. IMAP D. Enables email retrieval from a server

Choose the correct answer from the options given below:

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

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

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

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

Answer Key: 1

Solution:

? DNS: The Domain Name Service is essential for translating human-readable domain names into machine-readable IP addresses.

? SMTP: Simple Mail Transfer Protocol is used primarily for sending email between servers.

? FTP: File Transfer Protocol is utilized for the transferring of files across networks.

? IMAP: Internet Message Access Protocol allows users to retrieve and manage their email from a server.

Hence, Option (1) is the right answer.