--Question Starting--
Match the following data storage concepts with their associated technologies:
1. Storage Concept Technology
I. Volatile Memory A. SSD
II. Non-Volatile Memory B. RAM
III. Primary Storage C. Magnetic Tape
IV. Secondary Storage D. Hard Disk Drive
Choose the correct answer from the options given below:
(1) I-B, II-A, III-B, IV-D
(2) I-B, II-D, III-C, IV-A
(3) I-C, II-B, III-A, IV-D
(4) I-A, II-C, III-D, IV-B
Answer Key: 1
Solution:
? Volatile Memory: Typically refers to memory that requires power to maintain the stored information, such as RAM.
? Non-Volatile Memory: Memory that can retain data without the need for power, examples include SSDs.
? Primary Storage: Directly accessible by the CPU, often refers to RAM.
? Secondary Storage: Used for long-term data storage, such as HDDs or SSDs.
Hence, Option (1) is the right answer.

--Question Starting--
Match the following genetic algorithm components with their uses in problem-solving:
1. GA Component Use
I. Selection A. Exploring new gene combinations
II. Crossover B. Maintaining diversity in the gene pool
III. Mutation C. Improving fitness of offspring
IV. Elitism D. Preserving the best solutions found
Choose the correct answer from the options given below:
(1) I-D, II-A, III-C, IV-B
(2) I-C, II-B, III-A, IV-D
(3) I-B, II-C, III-A, IV-D
(4) I-A, II-D, III-B, IV-C
Answer Key: 2
Solution:
? Selection: Process used to choose which individuals to reproduce based on their fitness.
? Crossover: Genetic operator used to combine the genetic information of two parents to generate new offspring.
? Mutation: Introduces variability into the gene pool, which can lead to discovering new genetic combinations.
? Elitism: Ensures that the best-performing individuals are carried over to the next generation, preserving excellent solutions.
Hence, Option (2) is the right answer.

--Question Starting--
Match the following design principles with their implications in software engineering:
1. Design Principle Implication
I. Modularity A. Reduces complexity by dividing the system into smaller, manageable parts
II. Cohesion B. Each module performs a single task
III. Coupling C. Minimizes the dependencies between modules
IV. Abstraction D. Helps in hiding the unnecessary details from the user
Choose the correct answer from the options given below:
(1) I-A, II-D, III-B, IV-C
(2) I-A, II-B, III-C, IV-D

(3) I-D, II-A, III-B, IV-C
(4) I-C, II-D, III-A, IV-B
Answer Key: 2
Solution:
? Modularity: Involves breaking down a software system into manageable, independent modules.
? Cohesion: Refers to the degree to which elements of a module are functionally related; higher cohesion within a module is desired.
? Coupling: Describes how tightly connected software modules are to one another; lower coupling is preferred.
? Abstraction: Allows a developer to hide details that are not necessary, presenting only the essential features of an object or function.
Hence, Option (2) is the right answer.

--Question Starting--
Match the following genetic algorithm terms with their corresponding descriptions:
1. GA Term Description
I. Fitness Function A. Measures how well a solution solves the problem
II. Encoding B. Represents possible solutions using strings of bits, characters, or numbers
III. Genetic Operator C. Techniques used to alter the genetic composition of offspring
IV. Population D. A group of candidate solutions
Choose the correct answer from the options given below:
(1) I-C, II-D, III-B, IV-A
(2) I-A, II-B, III-C, IV-D
(3) I-B, II-C, III-A, IV-D
(4) I-D, II-A, III-B, IV-C
Answer Key: 2
Solution:
? Fitness Function: Used to evaluate how good a given solution is at solving the problem.
? Encoding: How solutions are represented within the genetic algorithm, typically as strings.
? Genetic Operator: Includes mechanisms like mutation and crossover that modify genetic material.
? Population: The set of all solutions currently considered by the algorithm.
Hence, Option (2) is the right answer.

--Question Starting--
Match the following network concepts with their correct descriptions:
1. Network Concept Description
I. OSI Model A. Foundation for understanding network architecture
II. TCP/IP B. Used for routing data across the internet
III. Switching C. Process of moving data packets between devices
IV. Addresses D. Identifies devices on a network
Choose the correct answer from the options given below:
(1) I-A, II-B, III-C, IV-D
(2) I-B, II-A, III-D, IV-C
(3) I-C, II-D, III-B, IV-A
(4) I-D, II-C, III-A, IV-B
Answer Key: 1
Solution:
? OSI Model: A conceptual framework used to understand network interactions in seven layers.
? TCP/IP: The protocol suite used by the internet for transmitting data.
? Switching: Refers to the technology and processes involved in transferring data packets between network nodes.
? Addresses: Used to uniquely identify each device on a network, enabling communication.
Hence, Option (1) is the right answer.