--Question Starting--
Match the following concepts of Linux operating systems with their fundamental principles:
1. Kernel Modules Characteristic
A. Allow dynamic extension of kernel capabilities without rebooting
B. Enforce process scheduling policies
C. Manage hardware abstraction and device interactions
D. Enable process synchronization mechanisms
Choose the correct answer from the options given below:
(1) 1-A, 2-B, 3-C, 4-D
(2) 1-C, 2-A, 3-D, 4-B
(3) 1-D, 2-C, 3-B, 4-A
(4) 1-B, 2-D, 3-A, 4-C
Answer Key: 2
Solution:
Kernel modules in Linux are dynamically loadable components that extend kernel functionality, enabling features like device drivers or file systems to be added without rebooting (1-C). Process scheduling policies determine how CPU time is allocated among processes (2-A). Hardware abstraction manages device interactions, facilitating hardware independence (3-D). Synchronization mechanisms coordinate process access to shared resources (4-B). The options align with these principles, thus option (2) correctly matches all components.
Hence, Option (2) is the right answer.

--Question Starting--
3. Match the following genetic algorithm components with their roles in the optimization process:
1. Encoding Strategies Role
A. Defines how solutions are represented as strings or chromosomes
B. Determines how solutions are evaluated and assigned fitness scores
C. Guides the creation of new solutions through genetic operators
D. Controls the overall cycle and termination criteria of the algorithm
Choose the correct answer from the options given below:
(1) 1-A, 2-B, 3-C, 4-D
(2) 1-C, 2-A, 3-B, 4-D
(3) 1-B, 2-C, 3-D, 4-A
(4) 1-D, 2-B, 3-A, 4-C
Answer Key: 4
Solution:
Encoding strategies define how candidate solutions are represented (1-A), which impacts the genetic operators that manipulate these representations (3-D). Fitness functions evaluate solutions? quality (2-B), guiding selection. The GA cycle involves selection, crossover, mutation, and termination conditions (4-D). The options align with these roles, making option (4) the correct match.
Hence, Option (4) is the right answer.