--Question Starting--
Match the following Activation Record components with their roles in runtime storage organization:
1. Activation Record Component Role
A. Return Address 1. Stores the address to return to after function call
B. Local Variables 2. Holds temporary data and function parameters
C. Control Link 3. Maintains control flow context
D. Dynamic Link 4. Links to the caller's activation record for nested calls
Choose the correct answer from the options given below:
(1) A-1, B-2, C-3, D-4
(2) A-2, B-1, C-4, D-3
(3) A-3, B-4, C-1, D-2
(4) A-4, B-3, C-2, D-1
Answer Key: 2
Solution:
? Return Address: Stored to know where to return after function execution, linked with activation record's control flow.
? Local Variables: Stored within activation record for each function invocation to preserve data specific to that call.
? Control Link: Points to the previous activation record, establishing the call stack structure.
? Dynamic Link: Connects to the caller's activation record, enabling access to non-local data and maintaining call hierarchy.
Hence, Option (2) correctly matches the components with their roles.

--Question Starting--
3. Match the following graph algorithms with their primary operational characteristics:
1. Breadth-First Search (BFS) Characteristic
A. Explores all neighbors before moving deeper
B. Finds the shortest path in unweighted graphs
C. Uses a queue data structure for traversal
D. Suitable for connectivity and level-wise traversal
Choose the correct answer from the options given below:
(1) A-B, B-C, C-D, D-A
(2) A-C, B-A, C-D, D-B
(3) A-D, B-B, C-A, D-C
(4) A-B, B-D, C-A, D-C
Answer Key: 2
Solution:
? BFS explores nodes level by level, which corresponds to exploring all neighbors before deeper nodes, using a queue.
? It finds shortest paths in unweighted graphs due to uniform traversal depth.
? The queue ensures the order of exploration, maintaining the level-wise approach.
? It?s widely used for connectivity checks and level-based traversal.
Hence, Option (2) correctly pairs the algorithm with its characteristic.

--Question Starting--
Match the following distributed system characteristics with their implications:
1. Robustness in Distributed File Systems Implication
A. Ensures data availability despite node failures
B. Requires redundancy and replication
C. Increases complexity in synchronization
D. Guarantees data consistency across nodes
Choose the correct answer from the options given below:
(1) A-B, B-C, C-D, D-A

(2) A-C, B-A, C-D, D-B
(3) A-B, B-D, C-C, D-A
(4) A-D, B-C, C-B, D-A
Answer Key: 3
Solution:
? Robustness ensures data availability even when some nodes fail, necessitating redundancy and replication.
? Replication introduces complexity in maintaining consistency and synchronization.
? Synchronization mechanisms are needed to ensure data consistency across distributed nodes.
? Data consistency guarantees are critical but require careful coordination, often increasing system complexity.
Hence, Option (3) correctly reflects the implications of robustness in distributed file systems.