

--Question Starting--

Match the following translation mechanisms with their respective operational characteristics:

1. Assemblers A. Translate entire source code at once and generate an object code
2. Interpreters B. Process source code line by line during execution
3. Compilers C. Convert high-level language into machine code before execution
4. Just-In-Time Compiler (JIT) D. Translate code during runtime, optimizing frequently used sections

Choose the correct answer from the options given below:

- (1) 1-C, 2-B, 3-A, 4-D
- (2) 1-B, 2-A, 3-D, 4-C
- (3) 1-A, 2-D, 3-B, 4-C
- (4) 1-D, 2-C, 3-A, 4-B

Answer Key: 2

Solution:

? Assemblers: Convert assembly language to machine code in one go, producing object code suitable for linking.

? Interpreters: Read and execute source code line by line, without generating an independent executable.

? Compilers: Convert the entire high-level program into machine code before execution, creating an executable.

? JIT Compilers: Translate code during runtime, often used in virtual machines, to optimize performance dynamically.

Hence, Option (2) is the right answer.

--Question Starting--

Match the following layers of OSI model with their primary functions:

1. Data Link Layer A. Establishes, manages, and terminates connections
2. Network Layer B. Handles addressing, routing, and packet forwarding
3. Transport Layer C. Provides end-to-end communication, error recovery, flow control
4. Physical Layer D. Transmits raw bit streams over physical medium

Choose the correct answer from the options given below:

- (1) 1-C, 2-B, 3-A, 4-D
- (2) 1-D, 2-C, 3-B, 4-A
- (3) 1-A, 2-D, 3-C, 4-B
- (4) 1-B, 2-A, 3-D, 4-C

Answer Key: 3

Solution:

? Data Link Layer: Ensures reliable node-to-node data transfer, framing, and error detection.

? Network Layer: Responsible for logical addressing, routing, and packet forwarding across networks.

? Transport Layer: Provides end-to-end communication, error recovery, and flow control between hosts.

? Physical Layer: Handles the transmission of raw bits over the physical medium, including electrical and mechanical specifications.

Hence, Option (3) is the right answer.

--Question Starting--

Match the following network access methods with their operational principles:

1. CSMA/CD A. Carrier sense detects the channel is free before transmitting, with collision detection
2. CSMA/CA B. Carrier sense with collision avoidance, used mainly in wireless networks
3. Token Passing C. Passes a token sequentially to regulate access in a ring or bus topology
4. Reservation D. Allocates specific time slots or resources for stations to transmit

Choose the correct answer from the options given below:

- (1) 1-A, 2-B, 3-C, 4-D
- (2) 1-B, 2-A, 3-D, 4-C
- (3) 1-C, 2-D, 3-A, 4-B
- (4) 1-D, 2-C, 3-B, 4-A

Answer Key: 1

Solution:

? CSMA/CD: In wired Ethernet, stations sense the carrier before transmitting, detecting collisions during transmission and backing off.

? CSMA/CA: Used in wireless networks; stations sense the channel and use collision avoidance techniques to reduce collisions.

? Token Passing: Stations pass a token around the network, allowing only the holder to transmit, ensuring collision-free access.

? Reservation: Stations reserve resources or time slots in advance, often in TDMA or similar protocols, to minimize contention.

Hence, Option (1) is the right answer.