

Q 33. A branch office requires secure communication with headquarters over the internet. The design must also provide bandwidth visibility and ensure that critical voice applications always take priority during congestion. Which solution satisfies all these needs?

- Ops:**
- A. VPN connectivity with QoS and monitoring
 - B. NAT policies combined with DHCP reservations
 - C. Proxy caching integrated with firewall devices
 - D. VLAN separation of voice and data traffic

Q 34. A banking app requires that debit and credit operations in a transfer either succeed together or fail together. Which implementation ensures this?

- Ops:**
- A. Using foreign keys across accounts
 - B. Creating triggers for automatic rollback
 - C. Writing to log files before updates
 - D. Wrapping debit and credit in a single transaction

Q 35. A retail system needs to list customers who placed orders in the last 90 days but excludes those whose accounts are inactive. Which query is most appropriate?

- Ops:**
- A. SELECT * FROM Customers WHERE LastOrderDate > CURRENT_DATE - INTERVAL '90 DAY' AND Status = 'Inactive';
 - B. SELECT * FROM Customers WHERE LastOrderDate < CURRENT_DATE - INTERVAL '90 DAY' AND Status = 'Active';
 - C. SELECT * FROM Customers WHERE LastOrderDate > CURRENT_DATE - INTERVAL '90 DAY' AND Status = 'Active';
 - D. SELECT * FROM Customers WHERE LastOrderDate > CURRENT_DATE - INTERVAL '90 DAY' AND OrderCount > 0;

Q 36. A bank deploys 200 microservices. Security requires every service-to-service call to use encryption and produce detailed traffic logs without rewriting code.

Which cloud-native solution supports this?

- Ops:**
- A. VPN tunnels connecting all subnets

- Ops:**
- A. CDN cache warming configured before the big event
 - B. Cloud-native load testing with scaling validation enabled
 - C. Reserved VM capacity configured for peak demand
 - D. Object storage archival configured to free up capacity

Q 39. A financial firm recently suffered a phishing attack where attackers stole admin passwords. Regulators now demand that admins must use a second factor such as OTP or hardware tokens when logging in to the cloud console.

Which solution should IT adopt?

- Ops:**
- A. Object lifecycle encryption
 - B. CDN edge certificates
 - C. Multi-Factor Authentication (MFA)
 - D. API throttling policies

Q 40. A university manages ten SaaS platforms for students. Password fatigue has increased helpdesk tickets and raised risks of weak reuse. IT leadership wants students to log in with their campus credentials across all apps, while ensuring role-based access is enforced centrally.

Which approach fits best?

- Ops:**
- A. CDN caching student portals
 - B. IAM logs only
 - C. Multi-cloud networking optimisations
 - D. Federated identity with SSO integration

SECTION 01/02

[Previous Section](#)

SECTION 02/02

[Next Section](#)

Q 30. A global bank maintains critical database replication between headquarters and its disaster recovery site. During nightly backup windows, engineers notice that replication traffic slows dramatically, leading to potential Recovery Point Objective (RPO) violations. QoS policies were configured, but investigation shows replication flows use non-standard ports, so they are not classified properly. All replication packets fall into the default best-effort class, losing bandwidth priority to backups. Which correction ensures replication consistently gets the required performance?

- Ops:**
- A. Update QoS policies to classify based on application/port
 - B. Deploy VLAN separation for replication servers only
 - C. Enable NAT overload for outbound replication sessions
 - D. Use DHCP reservations for database server addresses

Q 31. An enterprise network runs OSPF across hundreds of routers, all placed in a single area. During link or node changes, engineers observe slow convergence, heavy CPU usage, and a flood of Link State Advertisements (LSAs) spreading to every router. This impacts network stability and troubleshooting efforts. The team is asked to redesign OSPF so that updates are contained locally while still maintaining connectivity across the organisation. Which redesign improves scalability?

- Ops:**
- A. Shorten DHCP lease timers on critical hosts
 - B. Split into multiple OSPF areas summarised into backbone
 - C. Switch to RIP for all routing domains
 - D. Enable VLAN tagging at all distribution routers

Q 32. An enterprise introduces IPv6 alongside IPv4. Administrators want hosts to automatically assign IPv6 addresses without running a DHCPv6 server, while also remaining resolvable through DNS names. Which mechanism provides this capability?

- Ops:**
- A. Proxy neighbour discovery for IPv6 devices
 - B. IPv6 tunnelling across existing IPv4 networks
 - C. Manual static addressing on every single host
 - D. Stateless autoconfiguration with DNS integration

D. SELECT * FROM Customers WHERE LastOrderDate > CURRENT_DATE - INTERVAL '90 DAY' AND OrderCount > 0;

Q 36. A bank deploys 200 microservices. Security requires every service-to-service call to use encryption and produce detailed traffic logs without rewriting code.

Which cloud-native solution supports this?

- Ops:**
- A. VPN tunnels connecting all subnets
 - B. CDN edge servers near applications
 - C. Load balancers with SSL termination
 - D. Service mesh using sidecar proxies

Q 37. An e-commerce site notices slowdowns because frequently requested product details always hit the database. They decide to keep popular items in fast memory.

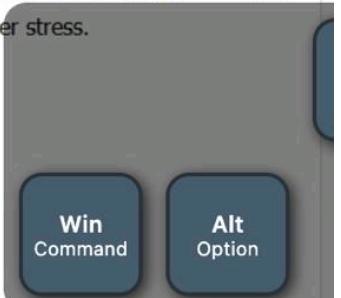
Which cloud service is this?

- Ops:**
- A. Block storage with high IOPS
 - B. Versioning of object storage for fast rollback
 - C. File storage mounted across app servers
 - D. In-memory caching layer integrated with DB

Q 38. A retailer is preparing for Black Friday. Past failures during checkout caused revenue loss. IT leadership requires a rehearsal where millions of simulated users generate traffic, allowing them to verify auto-scaling and load-balancer configurations under stress.

Which solution enables this?

- Ops:**
- A. CDN cache warming configured before the big event
 - B. Cloud-native load testing with scaling validation enabled
 - C. Reserved VM capacity configured for peak demand
 - D. Object storage archival configured to free up capacity



Q 27. A product analytics team must display a top-sellers leaderboard where equal sales must share the same rank, but subsequent positions should not skip numbers to keep reports readable.

To assign ranks that handle ties appropriately for this leaderboard, which statement is correct?

- Ops:**
- A. Dense_rank creates skipped numbers whenever ties appear in results lists.
 - B. Rank leaves gaps after ties; dense_rank compacts numbering continuously always.
 - C. Both functions behave identically for ties and overall numbering behaviour.
 - D. Both functions produce ranks without gaps when ties occur here.

Q 28. An e-commerce site tracks millions of customer profiles. The Gender column only has two possible values (M/F), but analysts frequently run reports filtering on this field to segment customers for campaigns. Query performance is slowing as the dataset grows.

To optimise filtering on such a low-cardinality column, which type of index is most suitable?

- Ops:**
- A. Hash index optimised for exact key lookups
 - B. Full-text index designed for word searching
 - C. Bitmap index ideal for few distinct values
 - D. B-tree index for general ordering operations

Q 29. An IT services firm implements Quality of Service (QoS) policies to give priority to voice-over-IP traffic. However, employees still experience call drops and jitter whenever large file transfers occur on the network. On closer inspection, administrators discover that all packets entering the switch are being stamped with the same DSCP value, meaning that voice traffic is not actually distinguished from data. To restore effective prioritisation, what correction must be applied?

- Ops:**
- A. Classification and marking of VoIP traffic at edge
 - B. DHCP reservations configured for all VoIP phones
 - C. NAT64 translation applied to VoIP application servers
 - D. VLAN tagging dedicated to all VoIP endpoints

02. IT Fundamentals

15 questions

Q 26. A pricing team wants to identify premium products by comparing them against all items in a specific category. The business rule is: only show products whose price is strictly higher than every product in CategoryID = 5.

What does the following query return?

```
SELECT Name FROM Products  
WHERE Price > ALL (SELECT Price FROM Products WHERE CategoryID = 5);
```

- Ops:**
- A. Finds products cheaper than all category 5 items
 - B. Finds products more expensive than every item in category 5
 - C. Finds only products belonging to category 5 items
 - D. Finds all products regardless of category and price

Q 27. A product analytics team must display a top-sellers leaderboard where equal sales must share the same rank, but subsequent positions should not skip numbers to keep reports readable.

To assign ranks that handle ties appropriately for this leaderboard, which statement is correct?

- Ops:**
- A. Dense_rank creates skipped numbers whenever ties appear in results lists.
 - B. Rank leaves gaps after ties; dense_rank compacts numbering continuously always.
 - C. Both functions behave identically for ties and overall numbering behaviour.
 - D. Both functions produce ranks without gaps when ties occur here.

Q 28. An e-commerce site tracks millions of customer profiles. The Gender column only has two possible values (M/F), but analysts frequently run reports filtering on this field to segment customers for campaigns. Query performance is slowing as the data grows.

To optimise filtering on such a low-cardinality column, which type of index is most suitable?



Q 15. What will be the output of the following pseudocode?

```
1.  
2.  
3. String s = "hardlevel"  
4. Integer x = INDEX(s,"d") + INDEX(s,"l")  
5. Integer y = LENGTH(s) - x  
6. If ((x MOD 3 = 0) AND (y > 2)) Then  
7.   x = x + y  
8. Else  
9.   x = x - y  
10. EndIf  
11. Output x  
12.
```

- Ops:
- A. 6
 - B. 4
 - C. 3
 - D. 5

Q 16. In a binary tree, the getHeight(node) function uses postorder traversal where the height of null is -1. When getHeight is called for node Y:

```
getHeight(Y.left) returns 4  
getHeight(Y.right) returns 2
```

What is the computed height of node Y?

- Ops:
- A. 5
 - B. 4



- B. 9
C. 11
D. 8

Q 14. What will be the output of the following pseudocode?

```
1.  
2.  
3. Integer arr[3][3] = {{2,4,6},{3,6,9},{5,10,15}}  
4. Integer res = arr[1][2] + arr[2][0] * arr[0][1] - arr[2][2] DIV  
   arr[0][0]  
5. Output res  
6.
```

- Ops: A. 25
B. 22
C. 24
D. 23

Q 15. What will be the output of the following pseudocode?

```
1.  
2.  
3. String s = "hardlevel"  
4. Integer x = INDEX(s,"d") + INDEX(s,"l")  
5. Integer y = LENGTH(s) - x  
6. If ((x MOD 3 = 0) AND (y > 2)) Then  
7.   x = x + y  
8. Else
```

- B. 18
C. 16
D. 12
-

Q 09. You are given a graph $G=(V,E)$ with the following properties:

- >The vertices can be divided into two sets X and Y.
- >Every edge in the graph connects a vertex from X to a vertex from Y.
- >No edge exists between two vertices in the same set.

What type of graph is G?

- Ops:**
- A. Bipartite Graph
 - B. Complete Graph
 - C. Cyclic Graph
 - D. Directed Graph
-

Q 10. Consider a problem where you need to perform numerous range sum queries (e.g., sum of elements from index i to j) and also frequently update individual elements (point updates) within a large array.

Which specialized tree-based data structure is optimally suited for this, providing logarithmic time complexity for both types of operations?

- Ops:**
- A. Hash Map
 - B. Stack
 - C. Segment Tree
 - D. Linked List
-

Q 11. What will be the output of the following pseudocode?

- Ops:**
- A. 149
 - B. 143
 - C. 7
 - D. 49

Q 08. What will be the output of the following pseudocode?

```
1.  
2.  
3. Integer a, b, c  
4. Set a = 10, b = 7, c = 3  
5. Set a = a + (b MOD c)  
6. Set b = b - (a DIV c)  
7. Set c = c + (a AND b)  
8. If ((a + b) MOD c = 0) OR ((a XOR c) > b) Then  
9.   Output a + b + c  
10. Else  
11.   Output a - b - c  
12. EndIf  
13.
```

- A. 8
- B. 18
- C. 16
- D. 12

Q 09. You are given a graph $G=(V,E)$ with the following properties:

Q 20. What will be the output of the following pseudocode?

```
1.  
2.  
3. FUNCTION check(a, b)  
4. IF a > b THEN  
5. RETURN a - b  
6. ELSE  
7. RETURN b - a  
8. ENDIF  
9. END FUNCTION  
10.  
11. FUNCTION wrap(m, n)  
12. RETURN check(m+1, n) + check(m, n+1)  
13. END FUNCTION  
14.  
15. out = wrap(4, 6)  
16. OUTPUT out  
17.
```

- Ops:
- A. 5
 - B. 7
 - C. 6
 - D. 4

Q 21. After removing the maximum value from the following max-heap

[500, 450, 480, 400, 390, 420, 300, 350, 320, 310, 280, 250, 200, 150, 100, 50]

Q 12. What will be the output of the following pseudocode?

```
1.  
2.  
3. FUNCTION F(a)  
4. IF a MOD 2 = 0 THEN  
5. RETURN a DIV 2  
6. ELSE RETURN 3*a + 1  
7. ENDIF  
8. END FUNCTION  
9.  
10. FUNCTION H(x, y)  
11. u = F(x)  
12. v = F(y)  
13. IF u < v THEN RETURN v - u  
14. ELSE RETURN u - v  
15. ENDIF  
16. END FUNCTION  
17.  
18. res = H(7, 10) + F(H(4, 5))  
19. OUTPUT res  
20.
```

- Ops:
- A. 26
 - B. 24
 - C. 27
 - D. 25

Q 24. What will be the output of the following pseudocode?

```
1.  
2.  
3. k = 12  
4. FOR i = 1 TO 5  
5. IF (i MOD 2 = 1) THEN  
6. k = k - i  
7. ELSE  
8. k = k + (i*2)  
9. ENDIF  
10. IF (k MOD 5 = 0) THEN  
11. k = k DIV 5  
12. ENDIF  
13. NEXT i  
14. OUTPUT k  
15.
```

- Ops:
- A. 2
 - B. 3
 - C. 0
 - D. 8

Q 25. What will be the output of the following pseudocode?

```
1.  
2.
```

Q 03. What will be the output of the following pseudocode?

```
1.  
2.  
3. s = 0  
4. FOR i = 1 TO 6  
5. IF i = 3 THEN CONTINUE ENDIF  
6. s = s + i  
7. NEXT i  
8. OUTPUT s  
9.
```

- Ops:
- A. 18
 - B. 21
 - C. 15
 - D. 16

Q 04. You want to sort the array [0.78, 0.17, 0.39, 0.26, 0.72, 0.94, 0.21, 0.12, 0.23, 0.68].

You decide to first divide the numbers into groups based on their value ranges, then sort the numbers within each group, and finally join all the groups to form the sorted array.

Which sorting algorithm best matches this approach?

- Ops:
- A. Heap Sort
 - B. Merge Sort
 - C. Quick Sort
 - D. Bucket Sort

Q 05. An AVL tree has nodes with values 15, 25, 35, 45, 55, 65. After deleting the node with value 65, a rebalancing operation is required.

Q 05. An AVL tree has nodes with values 15, 25, 35, 45, 55, 65. After deleting the node with value 65, a rebalancing operation is required.

What is the final balance factor of the node with value 45 after rebalancing?

- Ops:
- A. 0
 - B. -1
 - C. 2
 - D. 1

Q 06. What will be the output of the following pseudocode?

```
1.  
2.  
3. Real x, y  
4. Integer k, r  
5. Set x = 7.8, y = 2.3, k = 5  
6. Set r = FLOOR(x / y) + CEIL(y) - (k MOD 3)  
7. If ((r MOD 2 = 0) XOR (k > 4)) Then  
8. Output r + 1  
9. Else  
10. Output r - 1  
11. EndIf  
12.
```

- Ops:
- A. 3
 - B. 2
 - C. 1
 - D. 0

01. Pseudo Code

25 questions

Q 01. A binary tree has an Inorder traversal {C, F, A, E, D, B} and a Postorder traversal {C, F, E, B, D, A}. What is the root of the right subtree of the root of the tree?

- Ops:
- A. E
 - B. B
 - C. D
 - D. A

Q 02. What will be the output of the following pseudocode?

```
1.  
2.  
3. n = 12  
4. IF (n MOD 4 = 0) AND (n > 10) THEN  
5.   OUTPUT "Case1"  
6. ELSEIF (n MOD 6 = 0) OR (n < 5) THEN  
7.   OUTPUT "Case2"  
8. ELSE  
9.   OUTPUT "Case3"  
10. ENDIF  
11.
```

- Ops:
- A. Case2
 - B. Case3
 - C. Case1
 - D. Compilation Error

Q 13. What will be the output of the following pseudocode?

```
1.  
2.  
3. FUNCTION R(n)  
4. IF n <= 0 THEN RETURN 0  
5. IF (n MOD 2 = 0) OR (n AND 3 = 1) THEN  
6. RETURN R(n - 2) + n  
7. ELSE  
8. RETURN R(n - 1) - (n MOD 4)  
9. ENDIF  
10. END FUNCTION  
11.  
12. out = R(7)  
13. OUTPUT out  
14.
```

- Ops:
- A. 10
 - B. 9
 - C. 11
 - D. 8

Q 14. What will be the output of the following pseudocode?

```
1.  
2.  
3. Integer arr[3][3] = {{2,4,6},{3,6,9},{5,10,15}}  
4. Integer res = arr[1][2] + arr[2][0] * arr[0][1] - arr[2][2] DIV  
arr[0][0]
```

- C. 0
D. 8

Q 25. What will be the output of the following pseudocode?

```
1.  
2.  
3. a = 20  
4. b = 0  
5. WHILE a > 0  
6. IF (a AND 1) = 1 THEN  
7. b = b + (a >> 1)  
8. ELSE  
9. b = b - (a DIV 3)  
10. ENDIF  
11. a = a - 5  
12. ENDWHILE  
13. OUTPUT b  
14.
```

- Ops: A. 0
B. 1
C. -2
D. -4

SECTION 00/02
[Previous Section](#)

SECTION 02/02
[Next Section](#)

Q 07. What will be the output of the following pseudocode?

```
1.  
2.  
3. Integer m, n, p  
4. Set m = 14, n = 11, p = 6  
5. Set res = (m * n) - (p << 2) + (n MOD m)  
6. If (res MOD 5 = 0) Then  
7.   res = res / (m DIV 2)  
8. Else  
9.   res = res + (n AND p)  
10. EndIf  
11. If ((res < 50) OR (m - p > 10)) Then  
12.   res = res - (m OR n)  
13. EndIf  
14. Output res  
15.
```

- Ops:
- A. 149
 - B. 143
 - C. 7
 - D. 49

Q 08. What will be the output of the following pseudocode?

```
1.  
2.  
3. Integer a, b, c
```

Q 23. What will be the output of the following pseudocode?

```
1.  
2.  
3. c = 0  
4. FOR i = 1 TO 4  
5. FOR j = 1 TO 3  
6. IF (i + j) MOD 3 = 0 THEN  
7. CONTINUE  
8. ENDIF  
9. IF (i * j) MOD 2 = 1 THEN  
10. c = c + (i - j)  
11. ELSE  
12. c = c - (i + j)  
13. ENDIF  
14. NEXT j  
15. NEXT i  
16. OUTPUT c  
17.
```

- Ops:**
- A. -26
 - B. -24
 - C. -11
 - D. -19

Q 24. What will be the output of the following pseudocode?

- D. 5

Q 16. In a binary tree, the `getHeight(node)` function uses postorder traversal where the height of null is -1. When `getHeight` is called for node Y:

`getHeight(Y.left)` returns 4
`getHeight(Y.right)` returns 2

What is the computed height of node Y?

- Ops: A. 5
B. 4
C. 2
D. 3

Q 17. Match the expressions in Column X (Prefix) with their equivalent expressions in Column Y (Infix).

Column X (Prefix)

1. $+ * P Q / R S$
2. $- / P Q * R S$
3. $* + P Q - R S$

Column Y (Infix)

- i. $(P * Q) + (R / S)$
- ii. $(P / Q) - (R * S)$
- iii. $(P + Q) * (R - S)$

- Ops: A. 1-i, 2-ii, 3-iii
B. 1-iii, 2-i, 3-ii
C. 1-ii, 2-iii, 3-i
D. 1-i, 2-iii, 3-ii

Ops: A.

	X	Y	Z	W
X	0	3	7	0
Y	0	0	2	0
Z	0	4	0	0
W	5	0	1	0

B.

	X	Y	Z	W
X	0	3	0	7
Y	0	0	2	0
Z	0	4	0	0
W	5	0	1	0

C.

	X	Y	Z	W
X	0	3	7	0
Y	0	0	0	2
Z	0	4	0	0
W	5	1	0	0

D.

	X	Y	Z	W
X	0	3	7	0
Y	0	0	0	2
Z	0	4	0	0
W	5	0	1	0

D. 4

Q 21. After removing the maximum value from the following max-heap

[500, 450, 480, 400, 390, 420, 300, 350, 320, 310, 280, 250, 200, 150, 100, 50]

the last element 50 is moved to the root and heapify-down is performed to restore the max-heap property.

At which 0-based index does 50 end up after this extract-max operation?

- Ops:**
- A. Index = 13
 - B. Index = 11
 - C. Index = 12
 - D. Index = 14

Q 22. You are given a directed weighted graph represented by the following connections:

X -> Y (weight 3)

X -> Z (weight 7)

Y -> W (weight 2)

Z -> Y (weight 4)

W -> X (weight 5)

W -> Z (weight 1)

Which of the following adjacency matrices correctly represents this graph?

- Ops:**
- A.
- | | X | Y | Z | W |
|---|---|---|---|---|
| X | 0 | 3 | 7 | 0 |
| Y | 0 | 0 | 2 | 0 |
| Z | 0 | 0 | 0 | 0 |
| W | 0 | 0 | 0 | 5 |

- C. Segment Tree
D. Linked List

Q 11. What will be the output of the following pseudocode?

```
1.  
2.  
3. FUNCTION SCORE(n)  
4. c = 0  
5. FOR i = 1 TO n  
6. IF n MOD i = 0 THEN  
7. c = c + (i MOD 4)  
8. ELSE  
9. c = c - 1  
10. ENDIF  
11. NEXT i  
12. RETURN c  
13. END FUNCTION  
14.  
15. out = SCORE(12)  
16. OUTPUT out  
17.
```

- Ops: A. 1
B. 3
C. 5
D. 2

Q 12. What will be the output of the following pseudocode?

- C. 1-ii, 2-iii, 3-i
D. 1-i, 2-iii, 3-ii

Q 18. What will be the output of the following pseudocode?

```
1.  
2.  
3. String s = "abcd"  
4. Integer arr[6] = {1,2,3,4,5,6}  
5. Integer x = LENGTH(s) + LENGTH(arr)  
6. Output x  
7.
```

- Ops:** A. 9
B. 12
C. 11
D. 10

Q 19. A 2-D array $A[2..4][3..5]$ is stored in row-major order.

The base address $B = 30$, and each element occupies 2 bytes.

If the byte address of some element is 40 and the column index is 5,
what is the row index of this element (i.e., the value of i in $A[i][j]$)?

- Ops:** A. 3
B. 4
C. 2
D. Cannot be determined