

## **IIT M ENDTERM DIPLOMA EXAM QPC1**

### **Notations :**

- 1.Options shown in **green** color and with  icon are correct.
- 2.Options shown in **red** color and with  icon are incorrect.

**Question Paper Name :**

IIT M ENDTERM DIPLOMA EXAM QPC1

**Total Marks :**

220

## **PDSA**

**Number of Questions :** 27

**Section Marks :** 50

## **Question Number : 1 Question Type : MCQ**

### **Correct Marks : 0**

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: PROGRAMMING DATA STRUCTURES AND ALGORITHMS USING PYTHON"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

### **Options :**

A. ✓ YES

B. ✘ NO

## **Question Number : 2 Question Type : MCQ**

### **Correct Marks : 1.5**

Question Label : Multiple Choice Question

$$f_2(n) = 3n + (\log n)^2$$

$$f_3(n) = \log(\log n) + (\log n)^2$$

$$f_4(n) = 10 \log n$$

$$f_5(n) = 2^n \log n$$

Arrange the above functions in increasing order of asymptotic complexity.

### **Options :**

A. ✘  $f_3(n), f_4(n), f_2(n), f_1(n), f_5(n)$

B. ✘  $f_3(n), f_2(n), f_1(n), f_5(n), f_4(n)$

C. ✓  $f_4(n), f_3(n), f_2(n), f_1(n), f_5(n)$

D. ✘  $f_3(n), f_4(n), f_2(n), f_5(n), f_1(n)$

### Question Number : 3 Question Type : MCQ

Correct Marks : 1.5

Question Label : Multiple Choice Question

```
1 def prime_bad(n):
2     if n < 2:
3         return False
4     for i in range(2, n // 2):
5         if n % i == 0:
6             return False
7     return True
```

Here is a function `prime_bad` that takes a positive integer `n` as input and returns `True` if the number is prime and `False` otherwise. There is an error in this function. For which of the following input values of `n`, does function `prime_bad` returns an **incorrect** output?

Options :

- A. ✘ 2
- B. ✘ 3
- C. ✓ 4
- D. ✘ 5

### Question Number : 4 Question Type : MCQ

Correct Marks : 1.5

Question Label : Multiple Choice Question

What will be the time complexity of selection sort if the input list consists of `n` identical elements?

Options :

- A. ✘  $O(n)$
- B. ✘  $O(\log n)$
- C. ✘  $O(n \log n)$
- D. ✓  $O(n^2)$

## **Question Number : 5 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

The following sequence of operations is performed on a Stack:

1	PUSH(10)
2	PUSH(20)
3	POP
4	PUSH(10)
5	PUSH(20)
6	POP
7	POP
8	POP
9	PUSH(20)
10	POP

The sequence of values popped out from the Stack is:

**Options :**

- A. ❌ 20,10,20,10,20
- B. ✓ 20,20,10,10,20
- C. ❌ 10,20,10,20,20
- D. ❌ 20,20,10,20,10

## **Question Number : 6 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

**Linear probing** is an open addressing scheme in computer programming for resolving hash collisions in hash tables. Linear probing operates by taking the original hash index and adding successive values linearly until a free slot is found.

A hash table contains 10 buckets and uses linear probing to resolve collisions. The key values are integers and the hash function used is `key mod 10`. If key values 53, 164, 73, 122, 143 are inserted in to the table, in what location would the key value 143 be inserted?

**Options :**

- A. ❌ 3

B. ✗ 4

C. ✗ 5

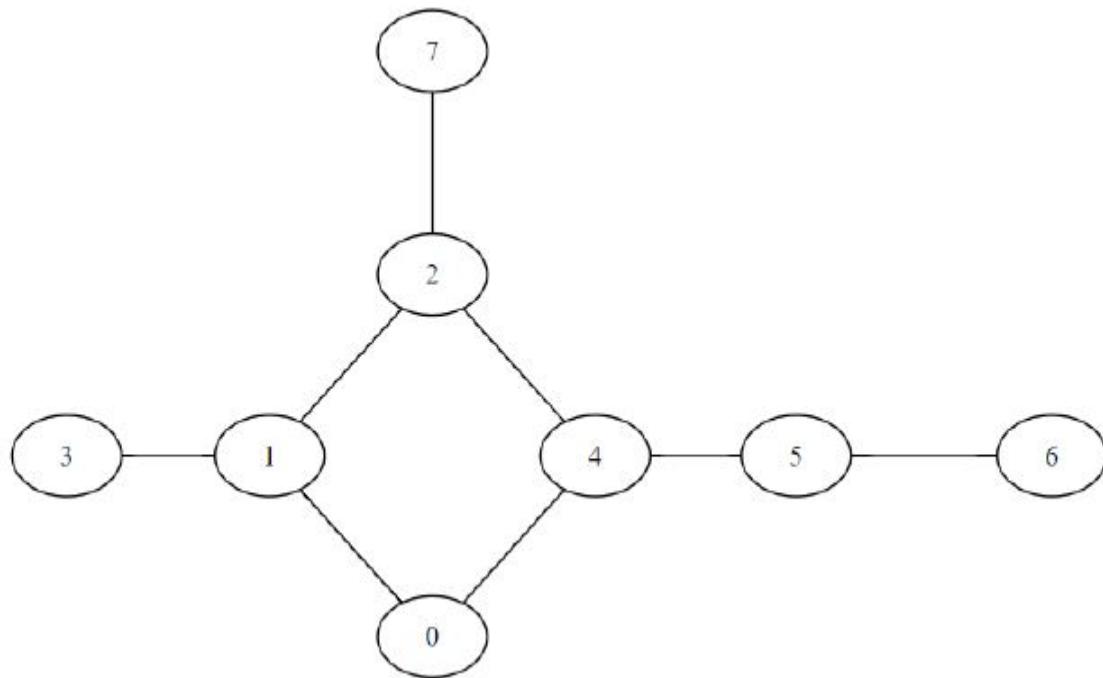
D. ✓ 6

**Question Number : 7 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

There are 8 systems (0,..,7) connected in network as shown in the figure given below.



Which of the following set of connections(edges) is to be added to the network so that if a single system goes down, the rest of the network remains connected?

**Options :**

A. ✗ `{(3,7), (5,7)}`

B. ✓ `{(3,7), (6,7)}`

C. ✗ `{(0,3), (0,6), (2,3)}`

D. ✗ `{(2,5), (3,7), (0,3)}`

## **Question Number : 8 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

A king's summer house is being rewired. The house has 11 rooms. To avoid wires getting entangled and creating short circuits, the electricians have been asked to observe the following rules.

- Room 1 must be rewired before rooms 3 and 4.
- Room 2 must be rewired before room 6.
- Room 3 must be rewired before room 5.
- Room 5 must be rewired before rooms 8 and 9.
- Room 6 must be rewired before room 7.
- Room 7 must be rewired before room 5.
- Room 8 must be rewired before room 10.
- Room 9 must be rewired before room 11.

It takes one full day to rewire a room. There are enough electricians to rewire as many rooms as can be rewired in parallel, keeping in mind the constraints above. What is the minimum number of days required to complete the job?

**Options :**

- A. ✘ 4  
B. ✘ 5  
C. ✓ 6  
D. ✘ 8

## **Question Number : 9 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

Let  $G = (V, E)$  be a simple undirected graph. Given a source vertex  $s$ , for  $x \in V$ , let  $d(x)$  denote the shortest distance in  $G$  from  $s$  to  $x$ . A breadth first search (BFS) is performed starting at  $s$ . Let  $T$  be the resultant BFS tree. If  $(u, v)$  is an edge of  $G$  that is not in  $T$ , then which one of the following **cannot** be the value of  $d(u) - d(v)$ ?

**Options :**

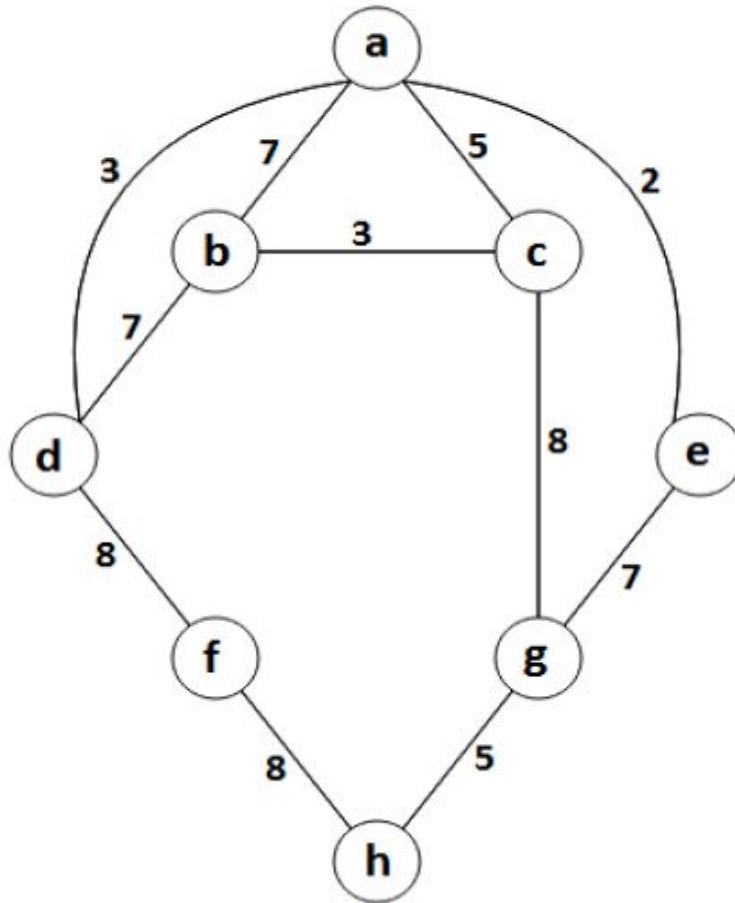
- A. ✘ -1
- B. ✘ 0
- C. ✘ 1
- D. ✓ 2

**Question Number : 10 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

In the given graph, if we try to find the shortest path from node **a** to all other nodes using Dijkstra's algorithm, in what order do the nodes get included in the visited set?



**Options :**

- A. ✘ a e d c b h f g
- B. ✓ a e d c b g f h
- C. ✘ a e d b c g f h

D. ✘ a e c d b g f h

### Question Number : 11 Question Type : MCQ

Correct Marks : 1.5

Question Label : Multiple Choice Question

Let  $w$  be the minimum among all edge weights in an undirected connected graph. Let  $e$  be a specific edge of weight  $w$ . Which of the following statement is **false**?

Options :

A. ✘ There is a minimum spanning tree containing  $e$ .

If  $e$  is not in a minimum spanning tree  $T$ , then in the cycle formed by adding  $e$  to  $T$ , all edges have the same weight.

C. ✘ Every minimum spanning tree has an edge of weight  $w$ .

D. ✓  $e$  is present in every minimum spanning tree.

### Question Number : 12 Question Type : MCQ

Correct Marks : 1.5

Question Label : Multiple Choice Question

If we perform the following operations on the max heap [30, 20, 25, 5, 15, 23, 10, 3, 2] then the resulting max heap would be:

```
1 | delete_max()  
2 | delete_max()  
3 | insert(30)
```

Options :

A. ✘ [30, 20, 5, 15, 23, 10, 3, 2]

B. ✘ [30, 23, 10, 15, 20, 2, 3, 5]

C. ✘ [30, 23, 20, 15, 10, 2, 3, 5]

D. ✓ [30, 23, 10, 20, 15, 2, 3, 5]

### Question Number : 13 Question Type : MCQ

Correct Marks : 1.5

Question Label : Multiple Choice Question

Which of the following are possible **valid** codes for the character set  $S = \{A, B, C, D, E, F\}$ , generated using the Huffman algorithm?

Options :

Character	A	B	C	D	E	F
Huffman code	000	0010	0101	01	10	11

A. ✘

Character	A	B	C	D	E	F
Huffman code	000	0010	0011	01	10	11

B. ✓

Character	A	B	C	D	E	F
Huffman code	100	1011	1001	011	101	000

C. ✘

Character	A	B	C	D	E	F
Huffman code	101	1100	1001	011	110	000

D. ✘

### Question Number : 14 Question Type : MCQ

Correct Marks : 1.5

Question Label : Multiple Choice Question

```

1 def kmp_fail(p):
2     m = len(p)
3     fail = [0 for i in range(m)]
4     j, k = 1, 0
5     while j < m:
6         if p[j] == p[k]:
7             fail[j] = k + 1
8             j, k = j + 1, k + 1
9         elif k > 0:
10            k = fail[k - 1]
11        else:
12            j = j + 1
13    return(fail)

```

Which of the following options represent the fail function (or prefix function) for pattern  $p = \text{ABABAABA}$  returned by the given `kmp_fail(p)` function?

**Options :**

A. ❌ [0, 1, 1, 2, 0, 1, 2, 3]

B. ✓ [0, 0, 1, 2, 3, 1, 2, 3]

C. ❌ [0, 1, 1, 2, 3, 1, 2, 3]

D. ❌ [0, 0, 1, 2, 3, 0, 1, 2]

**Question Number : 15 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

Which of the following combinations of input text  $T$  and pattern  $P$  will exhibit the worst case running time behavior for the Boyer-Moore skipping heuristic?

**Options :**

A. ❌  $T = \text{'baabaabaabaab'}$  and  $P = \text{'abba'}$

B. ✓  $T = \text{'aaaaaaaaaaaaaa'}$  and  $P = \text{'baaa'}$

C. ✘ T = 'aaaaaaaaaaaaaa' and P = 'abbb'

D. ✘ T = 'aaaaaaaaaaaaaa' and P = 'bbba'

### Question Number : 16 Question Type : MSQ

**Correct Marks : 2**

Question Label : Multiple Select Question

Which of the following statements is/are **correct** about the Quicksort algorithm? Assume that the first element in the list selected as pivot for partitioning each time.

**Options :**

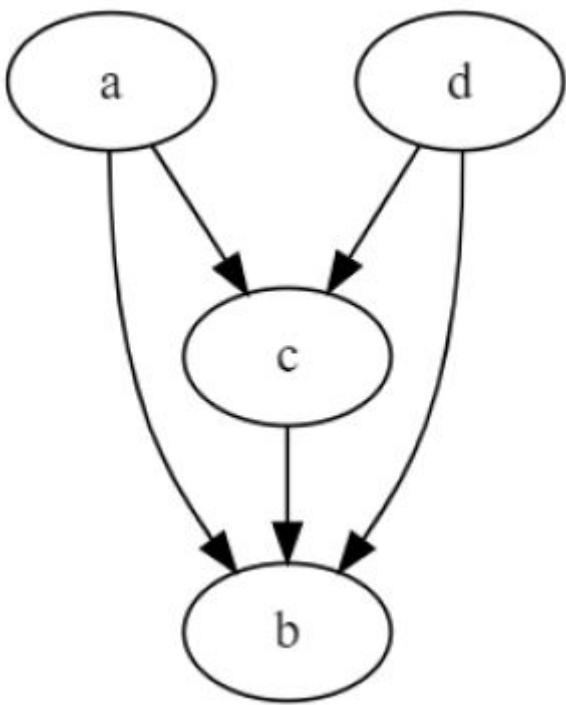
- A. ✓ The best case is when the pivot element always divides the list into two equal halves.
- B. ✘ The best case is only when the input list is arranged in ascending order.
- C. ✘ The worst case is when the pivot element always divides the list into two equal halves.
- D. ✓ The worst case is when the input list is arranged in either ascending or descending order.
- E. ✘ The worst case is only when the input list is arranged in descending order.

### Question Number : 17 Question Type : MSQ

**Correct Marks : 2**

Question Label : Multiple Select Question

Consider the directed graph given below



Which of the following is/are correct topological ordering(s) of the given graph?

**Options :**

A. ✓ a - d - c - b

B. ✗ a - b - c - d

C. ✓ d - a - c - b

D. ✗ d - c - b - a

**Question Number : 18 Question Type : MSQ**

**Correct Marks : 2**

Question Label : Multiple Select Question

Which of the following is/are **false** about Prim's algorithm?

**Options :**

A. ✗ It works only on a connected graph.

B. ✓ It constructs MCST by selecting edges in increasing order of their weights.

C. ✗ The worst case time complexity of Prim's algorithm is  $O(V^2)$ , if adjacency matrix is used.

Where V is the number of vertices.

- D. ✓ It doesn't work with negative edge weights.

### Question Number : 19 Question Type : MSQ

#### Correct Marks : 2

Question Label : Multiple Select Question

Which of the following is/are **true** about the Floyd-Warshall algorithm?

#### Options :

- A. ✓ It can detect negative weight cycles in the graph.

The time complexity of Floyd-Warshall is  $O(V^4)$ , where V is the number of vertices in the graph.

- C. ✓ It works if the graph has negative edge weights but does not have negative cycles.

The formula to compute the shortest path from vertex i to j in Floyd-Warshall algorithm is

D. ✗  $SP^k[i, j] = \min[SP^{k-1}[i, j] + SP^{k-1}[i, k], SP^{k-1}[k, j]]$

### Question Number : 20 Question Type : MSQ

#### Correct Marks : 2

Question Label : Multiple Select Question

Which of the following is/are **true** about AVL Tree? Assume that the height of the empty tree is 0.

#### Options :

Let  $s(h)$  denote the minimum number of nodes in an AVL tree of height  $h$  then

- A. ✓  $s(h) = s(h-1) + s(h-2) + 1$ , where  $s(0) = 0$  and  $s(1) = 1$ .

In AVL tree, the absolute difference between the height of the left subtree and the height of the right subtree of any node can't be more than 1.

- C. ✓ The complexity of searching in an AVL tree is  $O(\log n)$ .

D. ✘ If the height of an AVL tree is  $h$ , the maximum number of nodes will be  $2^h + 1$ .

E. ✘ The complexity of both insertion and deletion in AVL tree is  $O(n)$ .

### Question Number : 21 Question Type : MSQ

#### Correct Marks : 2

Question Label : Multiple Select Question

Let C be a problem that belongs to the class NP. Which of the following is/are true?

#### Options :

- A. ✓ If C is NP-Hard, then it is NP-complete.
- B. ✘ There is no polynomial time algorithm for C
- C. ✘ If C can be solved in polynomial-time, then P = NP.
- D. ✓ If every problem in NP is reducible to C in polynomial time, then C is NP-complete.

### Question Number : 22 Question Type : SA

#### Correct Marks : 2

Question Label : Short Answer Question

In a binary tree  $T$ , if the number of nodes with two children are 10, then the number of leaf nodes are \_\_\_\_\_.

**NOTE:** Enter your answer to the nearest integer.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

**Question Number : 23 Question Type : SA****Correct Marks : 2**

Question Label : Short Answer Question

Meetings M1, M2, ...., M11 are to be conducted in a single available meeting room. The table below gives the start and end times of these meetings. If any activity finishes at time  $T$ , then other activities can be started at time  $T$  or afterwards.

What is the maximum number of meetings that can be held in the meeting room without conflicts?

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11
start	4	2	7	9	10	7	6	3	6	2	8
end	7	5	10	12	14	10	8	5	9	7	9

**NOTE:** Enter your answer to the nearest integer.**Response Type :** Numeric**Evaluation Required For SA :** Yes**Show Word Count :** Yes**Answers Type :** Equal**Text Areas :** PlainText**Possible Answers :**

4

**Question Number : 24 Question Type : SA****Correct Marks : 2**

Question Label : Short Answer Question

Consider the Rabin-Karp algorithm using modulo arithmetic to match the pattern in base 10. Taking modulo  $q=11$ , how many **false positives** matches does the Rabin-Karp matcher encounter while searching pattern 26 in the text 3141592653589793 ?

**NOTE:** Enter your answer to the nearest integer.**Response Type :** Numeric

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

3

**Question Number : 25 Question Type : SA**

**Correct Marks : 2**

Question Label : Short Answer Question

Let G be a simple graph. The size of the minimum vertex cover of G is 12 and the size of the maximum independent set of G is 15. What are the number of vertices in graph G?

**NOTE:** Enter your answer to the nearest integer.

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

27

**Question Type : COMPREHENSION**

**Question Numbers : (26 to 28)**

Question Label : Comprehension

Consider the following function `do_something(A, B)`, where `A` and `B` are two strings of length `m` and `n` respectively.

```
1 def do_something(A, B):
2     m = len(A)
3     n = len(B)
4     T = [[0] * (n + 2) for i in range(m + 2)]
5     for i in range(m + 1):
6         for j in range(n + 1):
7             if i == 0:
8                 T[i][j] = j
9             elif j == 0:
10                T[i][j] = i
11             elif (A[i - 1] == B[j - 1]):
12                 T[i][j] = 1 + T[i - 1][j - 1]
13             else:
14                 T[i][j] = 1 + min(T[i - 1][j], T[i][j - 1])
15     return T[m][n]
```

Based on the above data, answer the given subquestions.

### Sub questions

**Question Number : 26 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

What does function `do_something(A, B)` return?

**Options :**

- A. ✓ Length of the shortest possible string `s`, where `A` and `B` are subsequence of `s`.
- B. ✗ Length of the longest common subsequence of `A` and `B`
- C. ✗ Length of the longest continuous common sequence of `A` and `B`
- D. ✗ Edit distance between `A` and `B`

**Question Number : 27 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

Function `do_something(L, k)` is an example of:

**Options :**

- A. ✘ A greedy algorithm
- B. ✘ A divide and conquer algorithm
- C. ✓ A dynamic programming algorithm
- D. ✘ None of these

**Question Number : 28 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

What is the time complexity of function `do_something(L, k)` ?

**Options :**

- A. ✘  $O(m + n)$
- B. ✘  $O(m \log n)$
- C. ✓  $O(mn)$
- D. ✘  $O(n \log m)$

**Question Type : COMPREHENSION**

**Question Numbers : (29 to 31)**

Question Label : Comprehension

Consider the following function `mystery(arr, low, high)`, where `arr` is a list of strings and `low` and `high` are indices of list `arr`.

```
1 def match(str1, str2):
2     result = ''
3     n1, n2 = len(str1), len(str2)
4     i, j = 0, 0
5     while i <= n1 - 1 and j <= n2 - 1:
6         if str1[i] != str2[j]:
7             break
8         result += str1[i]
9         i, j = i + 1, j + 1
10    return result
11
12 def mystery(arr, low, high):
13     if low == high:
14         return arr[low]
15     if high > low:
16         mid = (low + high) // 2
17         str1 = mystery(arr, low, mid)
18         str2 = mystery(arr, mid + 1, high)
19         return match(str1, str2)
```

Based on the above data, answer the given subquestions.

### Sub questions

#### Question Number : 29 Question Type : MCQ

Correct Marks : 1.5

Question Label : Multiple Choice Question

What does function `mystery(arr, 0, len(arr)-1)` return?

Options :

A. ✘ Longest common subsequence of all strings in list `arr` .

B. ✓ Longest common prefix of all strings in list `arr` .

C. ✘ Longest common suffix of all strings in list `arr` .

D. ✘ Longest common substring of all strings in list `arr` .

**Question Number : 30 Question Type : MCQ****Correct Marks : 1.5**

Question Label : Multiple Choice Question

Function `mystery` is an example of:**Options :**

- A. ✘ A greedy algorithm.
- B. ✓ A divide and conquer algorithm.
- C. ✘ A dynamic programming algorithm.
- D. ✘ None of these

**Question Number : 31 Question Type : MCQ****Correct Marks : 1.5**

Question Label : Multiple Choice Question

What is the time complexity for function `mystery` ?Assume the size of the input list is `n` and the length of the longest string in the list is `m`.**Options :**A. ✘  $O(n + m)$ B. ✘  $O(n \log m)$ C. ✘  $O(m \log n)$ D. ✓  $O(nm)$ **DBMS**

**Question Number : 32 Question Type : MCQ****Correct Marks : 0**

Question Label : Multiple Choice Question

**THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: DATABASE MANAGEMENT SYSTEMS"****ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?****CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.****(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)****Options :**A.  YESB.  NO**Question Number : 33 Question Type : MCQ****Correct Marks : 1**

Question Label : Multiple Choice Question

Figure 1 shows Table Employee along with the record numbers (specified as *rec. no. i* for each record in the table).

	<b>emp_id</b>	<b>name</b>	<b>bdate</b>	<b>zip</b>	<b>sex</b>	<b>salary</b>
(rec. no. 1)	1001	AJAY	1988-02-22	700010	M	30000
(rec. no. 2)	1002	ARIF	1979-03-10	600123	M	60000
(rec. no. 3)	1003	ANITHA	1977-06-08	800112	F	50000
(rec. no. 4)	1004	BRINDA	1966-09-09	600144	F	65000
(rec. no. 5)	1005	RAJ	1978-06-18	560118	M	70000
(rec. no. 6)	1006	ADITI	1979-03-10	700145	F	55000

Figure 1: Table Employee

The associated ordered index file has consecutive entries with record pointers pointing to the record numbers: 5, 2, 4, 1, 6, 3. Identify the attribute on which the index is built.

**Options :**

A. ✘ name

B. ✘ bdate

C. ✓ zip

D. ✘ salary

### Question Number : 34 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Consider a data file having records with two fields (*genre* and *movie*).

Suppose the file has nine records (with the records numbered from 1 to 9) with following values:

1. (Animation, Chicken Run)
2. (Drama, The Godfather)
3. (Action, Logan)
4. (Drama, Titanic)
5. (Action, Avengers: Endgame)
6. (Animation, Tom and Jerry)
7. (Drama, Gladiator)
8. (Animation, Shrek)
9. (Action, Rewind)

If a bitmap index is to be added for the field *genre*, then identify the correct bitmap index from the following (consider left to right ordering of bits in the bitmap).

Options :

Animation: 100001010

Drama: 011100000

A. ✘ Action: 000010101

Animation: 101

Drama: 011

B. ✘ Action: 110

Animation: 100001010

Drama: 010100100

C. ✓ Action: 001010001

Animation: 101001000

Drama: 010000110

D. ✘ Action: 000110001

### Question Number : 35 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Consider the following log of two transactions in a log-based recovery system that uses the deferred database modification scheme.

#Step	Details of log
1	$< T_0, \text{start} >$
2	$< T_0, A, 1200, 900 >$
3	$< T_0, B, 1000, 800 >$
4	$< T_1, \text{start} >$
5	$< T_1, D, 200, 50 >$
6	$< T_1, E, 100, 30 >$
7	$< T_0, \text{commit} >$

If a crash occurs just after step 7 and the recovery of the system is successfully completed, then which of the following actions is true?

Options :

A. ✘  $T_0$  : Redo and  $T_1$  : Undo

B. ✓  $T_0$  : Redo and  $T_1$  : No action

C. ✘  $T_0$  : Undo and  $T_1$  : No action

D. ✘  $T_0$  : Undo and  $T_1$  : Redo

### Question Number : 36 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Consider the following statements:

1. If a crash/rollback occurs before operation completes, then logical undo is performed.
2. If a crash/rollback occurs after the operation completes, then physical undo is performed.

Choose the correct option regarding the given statements.

**Options :**

- A. ✘ Both the statements are correct.
- B. ✘ Statement 1 is correct and statement 2 is wrong.
- C. ✘ Statement 1 is wrong and statement 2 is correct.
- D. ✓ Both the statements are wrong.

**Question Number : 37 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Which among the following statements is true about multitable clustering file organization?

**Options :**

- A. ✘ It stores records in a sequential order according to a search key.
- B. ✘ It stores records wherever there is a space for them.
- C. ✓ It stores records of multiple relations in the same file.
- D. ✘ None of these

**Question Number : 38 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Assume that Figure 7 shows the steps involved in processing a query.

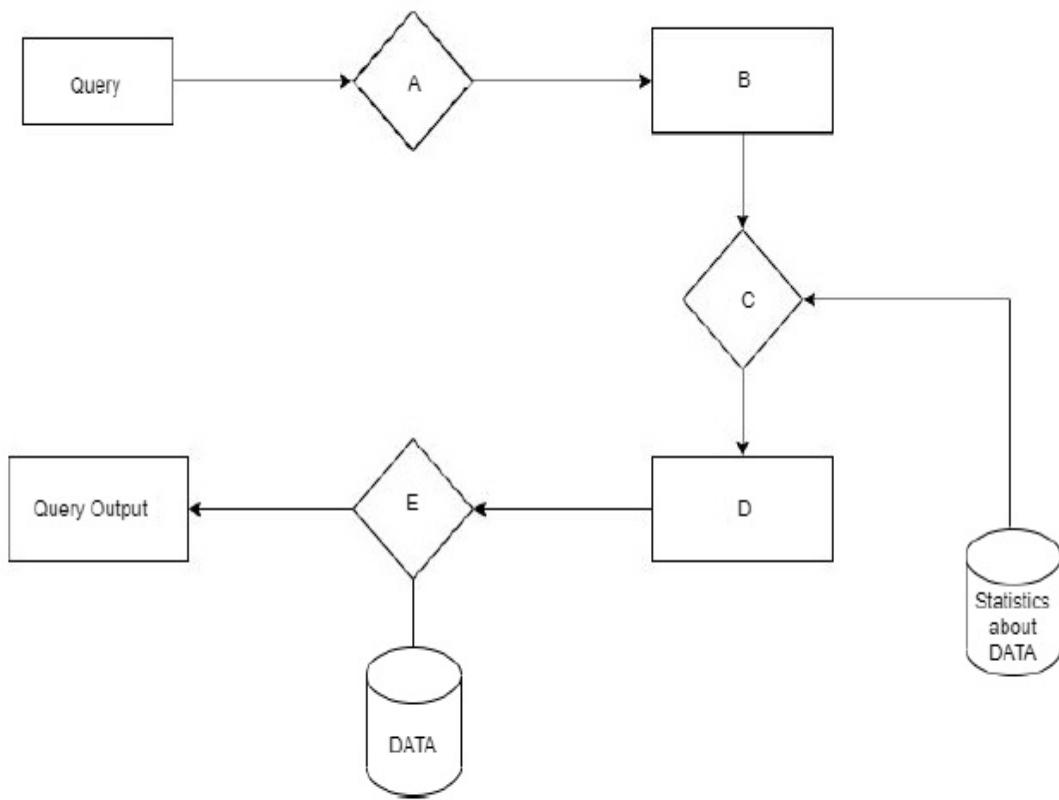


Figure 7: Steps in query processing

From among the options given, choose the one that correctly matches A, B, C, D & E in the given figure.

**Options :**

- A: Parser and Translator, B: Relational Algebra Expression, C: Execution Plan, D: Optimizer, E: Evaluation Engine

- B.  Execution Plan, E: Evaluation Engine

- C.  Engine, D: Optimizer, E: Evaluation Plan

- D.  Evaluation Engine, E: Evaluation Plan

**Correct Marks : 1****Question Label : Multiple Choice Question**

Consider the following relations:

$\text{orders}(\underline{\text{id}}, \text{price}, \text{quantity})$

$\text{merchant}(\underline{\text{merchant\_id}}, \text{merchant\_name}, \text{country\_code})$

$\text{products}(\underline{\text{pid}}, \text{name}, \text{merchant\_id}, \text{price}, \text{status})$

Choose the correct relational algebra expression that finds the names of products whose price is more than 500.

**Options :**

A. ❌  $\sigma_{\text{name}}(\Pi_{\text{price} > 500}(\text{products}))$

B. ❌  $\sigma_{\text{name}}(\Pi_{\text{price} > 500}(\text{orders}))$

C. ✓  $\Pi_{\text{name}}(\sigma_{\text{price} > 500}(\text{products}))$

D. ❌  $\Pi_{\text{name}}(\sigma_{\text{price} > 500}(\text{orders}))$

**Question Number : 40 Question Type : MCQ****Correct Marks : 1.5****Question Label : Multiple Choice Question**

Consider schedule S as given below.

S:  $r5(Z), w1(Y), r2(Y), w3(Y), r4(Y), w2(P), r5(P), w4(X), r1(Q), r5(X), w5(Y)$

Which among the following serial schedules is schedule S conflict serializable to?

**Options :**

A. ❌  $T3 \rightarrow T4 \rightarrow T1 \rightarrow T2 \rightarrow T5$

B. ❌  $T1 \rightarrow T4 \rightarrow T3 \rightarrow T2 \rightarrow T5$

C. ❌  $T5 \rightarrow T4 \rightarrow T3 \rightarrow T2 \rightarrow T1$

D. ✓  $T_1 \rightarrow T_2 \rightarrow T_3 \rightarrow T_4 \rightarrow T_5$

**Question Number : 41 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

Figure 2 shows the precedence graph of a conflict serializable schedule S. How many serial schedules are there to which S can be conflict serialized?

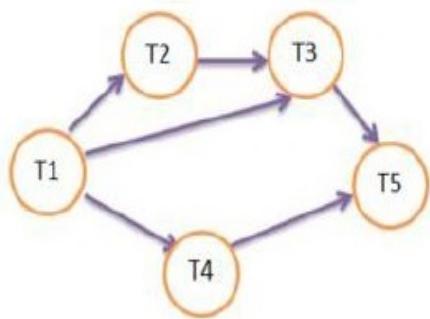


Figure 2: Precedence Graph of schedule S

**Options :**

- A. ✘ 0
- B. ✘ 1
- C. ✘ 2
- D. ✓ 3

**Question Number : 42 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

Consider the weekly backup schedule given in Figure 4, and answer the question that follows.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Incremental	Incremental	-----	Incremental	Incremental	Full	Incremental

Figure 4: Weekly backup schedule

Assume that an ‘Incremental Backup’ is done on Wednesday. Then, how many backup sets have to be loaded for a complete recovery, if a system failure occurs on the following Friday, after Friday’s backup is completed?

*Note: Assume Saturday was December 11 and Friday is December 17.*

**Options :**

- A. ✘ 1
- B. ✘ 5
- C. ✘ 6
- D. ✓ 7

**Question Number : 43 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

Consider a disk with a sector size of 512 bytes, 2000 tracks per surface, 50 sectors per track, and 5 double-sided platters. Find the number of cylinders that the disk has. Also, if the disk platters rotate at 5400 rpm (revolution per minute), what is the average rotational delay?

**Options :**

- A. ✘ Number of cylinders = 4000, Average Rotational Delay = 0.05 seconds
- B. ✘ Number of cylinders = 2000, Average Rotational Delay = 0.011 seconds
- C. ✘ Number of cylinders = 4000, Average Rotational Delay = 0.001 seconds
- D. ✓ Number of cylinders = 2000, Average Rotational Delay = 0.0055 seconds

**Question Number : 44 Question Type : MCQ**

**Correct Marks : 1.5**

Question Label : Multiple Choice Question

Consider the E-R diagram shown in Figure 6, and answer the question that follows.

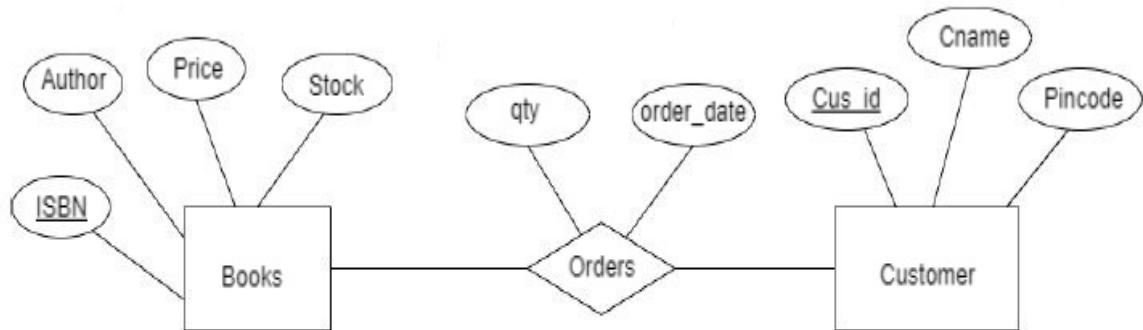


Figure 6: E-R Diagram

Choose the most appropriate SQL statement to create a table representing the relationship set Orders.

**Options :**

CREATE TABLE Orders ( ISBN CHAR(10),  
Cus\_id INTEGER,  
qty INTEGER,  
order\_date DATE,  
FOREIGN KEY (ISBN) REFERENCES Books,  
A. ❌ FOREIGN KEY (Cus\_id) REFERENCES Customer)

CREATE TABLE Orders ( ISBN CHAR(10),  
Cus\_id INTEGER,  
qty INTEGER,  
B. ❌ order\_date DATE)

CREATE TABLE Orders ( ISBN CHAR(10),  
Cus\_id INTEGER,  
qty INTEGER,  
order\_date DATE,  
PRIMARY KEY (ISBN, Cus\_id),  
FOREIGN KEY (ISBN) REFERENCES Books,  
C. ✓ FOREIGN KEY (Cus\_id) REFERENCES Customer)

CREATE TABLE Orders ( ISBN CHAR(10),  
Cus\_id INTEGER,  
qty INTEGER,  
order\_date DATE,  
D. ❌ PRIMARY KEY (ISBN, Cus\_id) )

**Question Number : 45 Question Type : MCQ****Correct Marks : 1.5**

Question Label : Multiple Choice Question

Consider the following schema:

Students(sid, sname, age, department)Books(ISBN, bname, author)Orders(sid, ISBN, date)

Choose the correct option to fill in the blanks of the query given below, such that the query finds the names of students who have ordered all the books.

```
SELECT S.sname  
FROM Students S  
WHERE _____A_____ (( SELECT O.ISBN FROM _____B_____ )  
EXCEPT  
(SELECT B.ISBN FROM _____C_____ WHERE B.sid = S.sid ))
```

**Options :**

A. ✘ A: NOT EXISTS, B: Orders O, C: Books B

B. ✓ A: NOT EXISTS, B: Books O, C: Orders B

C. ✘ A: EXISTS, B: Orders O, C: Books B

D. ✘ A: EXISTS, B: Books O, C: Orders B

**Question Number : 46 Question Type : MCQ****Correct Marks : 1.5**

Question Label : Multiple Choice Question

Consider the following statements.

1. In RAID level a, if 8 data disks are present, then accessing a single byte would require the fetching of 8 blocks from subsequent disks.
2. RAID level b has 50% effective space utilization.
3. RAID level c allows parallel processing of multiple write requests and uses block interleaved parity.
4. Write performance of RAID level c is better than that of RAID level d.
5. RAID level d can recover from two simultaneous disk failures.

Choose the correct RAID level for a, b, c, d.

**Options :**

- A. ✗ a = 1, b = 2, c = 3, d = 4
- B. ✗ a = 3, b = 1, c = 6, d = 5
- C. ✓ a = 2, b = 1, c = 5, d = 6
- D. ✗ a = 2, b = 1, c = 6, d = 5

**Question Number : 47 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

Consider the Table food\_distribution given below.

card_type	city_name	number
RKSY-1	Mexico	30
RKSY-1	Paris	40
RKSY-2	Paris	10
PHH	Paris	20
RKSY-1	Boston	50
RKSY-2	Boston	20
PHH	Chicago	10

Table 2: food\_distribution

What will be the output of the following query?

```
with X (name, number) as
    (select city_name, sum(number)
     from food_distribution
     group by city_name),
Y (number) as
    (select avg(number)
     from X)
select name
    from X, Y
   where X.number < Y.number;
```

Options :

name
Mexico
Paris
Boston
Chicago

A. ✘

B. ✘

name
Chicago
Boston

name
Mexico
Paris

C. ✘

name
Chicago
Mexico

D. ✓

### Question Number : 48 Question Type : MSQ

**Correct Marks : 1.5**

Question Label : Multiple Select Question

Consider transaction T1 on a uni-programming system, as given below. A system failure occurs just before step 5. However, since immediate modification scheme is used, the updates still gets reflected in the database.

Note: A uni-programming system accepts schedules in serial order.

Transaction T1

1. read(A)
2. A := A - 50
3. write(A)
4. read(B)
5. B := B + 50
6. write(B)

Assuming that recovery of the database is not done, which among the following properties of a transaction is/are violated in this process?

**Options :**

- A. ✓ Consistency
- B. ✓ Atomicity
- C. ✘ Isolation
- D. ✘ Durability

**Question Number : 49 Question Type : MSQ****Correct Marks : 1.5**

Question Label : Multiple Select Question

Consider a state of transactions as shown in Figure 3.

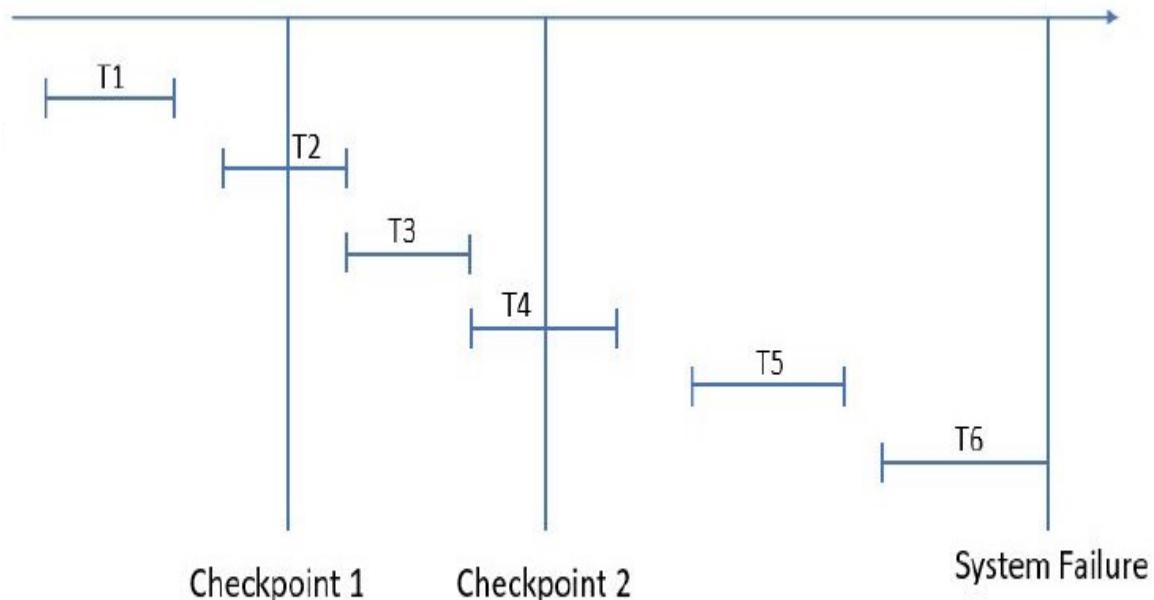


Figure 3: State of transactions

Which of the following statements is/are correct with respect to the given state?

**Options :**

- A. ✓ T1, T2 and T3 can be ignored.
- B. ✗ Only T1 can be ignored.
- C. ✓ T4 and T5 need to be redone.
- D. ✗ T5 and T6 need to be undone and restarted.

**Question Number : 50 Question Type : MSQ****Correct Marks : 1.5**

Question Label : Multiple Select Question

Consider a relation  $R = (A, B, C, D, E, F, G, H)$  and an associated set of functional dependencies:

$$F = \{A \rightarrow B, ABCD \rightarrow E, EF \rightarrow G, EF \rightarrow H, ACDF \rightarrow EG\}.$$

Choose the extraneous attribute(s) in  $F$ .**Options :**

- A. ✓ B

B. ✘ C

C. ✓ E

D. ✓ G

E. ✘ F

### Question Number : 51 Question Type : MSQ

Correct Marks : 2

Question Label : Multiple Select Question

Suppose that the accounts A and B have ₹100 and ₹200, respectively. Transaction  $T_1$  transfers an amount of ₹25 from account B to account A. Transaction  $T_2$  displays the total money in accounts A and B.

T1:

```
lock-X(B);  
read(B);  
B := B - 25;  
write(B);  
unlock(B);  
lock-X(A);  
read(A);  
A := A + 25;  
write(A);  
unlock(A);
```

T2:

```
lock-S(A);  
read(A);  
unlock(A);  
lock-S(B);  
read(B);  
unlock(B);  
display(A + B)
```

From among the following options, choose the value/values that will never be displayed when  $T_1$  and  $T_2$  are executed concurrently.

Options :

A. ✘ ₹275

B. ✘ ₹300

C. ✓ ₹325

D. ✓ ₹250

**Question Number : 52 Question Type : MSQ****Correct Marks : 2**

Question Label : Multiple Select Question

Consider the Binary Search Tree (BST) shown in Figure 5.

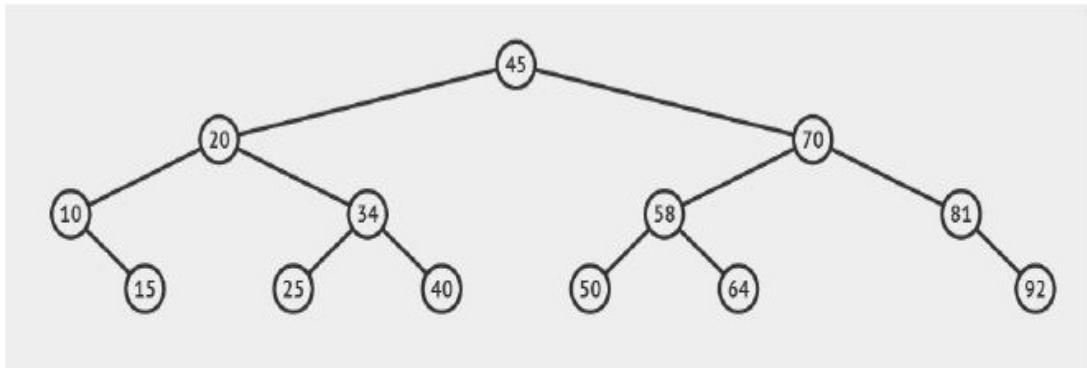


Figure 5: Binary Search Tree

Which of the following is/are the correct insertion order(s) that will result in the given BST?

**Options :**

- A. ✓ 45,70,20,10,34,25,15,81,92,58,64,40,50
- B. ✗ 45,70,20,10,25,34,81,92,15,58,64,40,50
- C. ✗ 45,20,70,34,10,15,25,81,92,40,64,58,50
- D. ✓ 45,20,70,34,10,25,15,81,92,58,64,40,50

**Question Number : 53 Question Type : MSQ****Correct Marks : 2**

Question Label : Multiple Select Question

Consider a relation  $R = (A, B, C, D, E, F, G, H)$  and an associated set of functional dependencies:  $F = \{A \rightarrow B, ABCD \rightarrow E, EF \rightarrow G, EF \rightarrow H, ACDF \rightarrow EG\}$ .

Let  $R$  be decomposed into relations  $R_1$ ,  $R_2$  and  $R_3$  such that

$$R_1 = (A, B)$$

$$R_2 = (A, C, D, E, F)$$

$$R_3 = (E, F, G, H)$$

Then, which of the following statements is/are true?

**Options :**

- A. ✓ The decomposition of  $R$  is a lossless decomposition.

B. ❌ R2 is not in 3NF.

C. ✓ R1 and R3 are in 3NF.

D. ❌ ACDFE is the only candidate key for relation R.

### Question Number : 54 Question Type : MSQ

Correct Marks : 2

Question Label : Multiple Select Question

Consider the relation  $R(I,J,K,L,M)$  and an associated functional dependency set  $\mathcal{F} = \{I \rightarrow JK, KL \rightarrow M, J \rightarrow L, M \rightarrow I\}$ .

Choose all the correct options from among the ones given below.

Options :

Relation R can be decomposed into smaller relations, each of which is in BCNF, while preserving all the dependencies.

A. ✓ BCNF, while preserving all the dependencies.

B. ❌ Relation R cannot be in 3 NF along with preservation of all dependencies.

C. ❌ Relation R cannot be in 2 NF along with preservation of all dependencies.

Relation R cannot be decomposed into smaller relations, each of which is in BCNF, while preserving all the dependencies, because R has composite

D. ❌ candidate keys.

### Question Number : 55 Question Type : MSQ

Correct Marks : 1

Question Label : Multiple Select Question

A bridge is a special kind of driver that uses another driver-based technology. Which of the following statements is/are true about bridges?

Options :

- A. ✓ An ODBC - JDBC bridge consists of an ODBC driver which uses the services of a JDBC driver to connect to a database.
- B. ✗ A JDBC - ODBC bridge consists of an ODBC driver which uses the services of a JDBC driver to connect to a database.
- C. ✓ An OLE DB - ODBC bridge consists of an OLE DB Provider which uses the services of an ODBC driver to connect to a target database.
- D. ✗ An ADO.NET - ODBC bridge consists of an ODBC driver which uses the services of a ADO.NET driver to connect to a target database.

**Question Number : 56 Question Type : MSQ**

**Correct Marks : 1**

Question Label : Multiple Select Question

When we compare file handling via Python with SQL for data management in DBMS, which of the following is/are correct regarding support for arithmetic and logical operations?

**Options :**

- A. ✓ Python provides with extensive support for arithmetic and logical operations.
- B. ✗ SQL provides extensive support for arithmetic and logical operations.
- C. ✗ Complex computations can be performed by using SQL.
- D. ✓ Complex computations can be performed by using Python.

**Question Number : 57 Question Type : SA**

**Correct Marks : 1.5**

Question Label : Short Answer Question

Consider a multilevel index, where the outermost index (or the top-level index) must be kept into a single disk block. In each block, at most 40 index entries can be accommodated. If there are 16,000 blocks at the innermost index (first-level index), then what is the minimum number of blocks to be accessed in order to access a record from the data file by searching the multilevel index?

**NOTE:** Enter your answer to the nearest integer.

**Response Type :** Numeric

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

5

**Question Number : 58 Question Type : SA**

**Correct Marks : 1.5**

**Question Label : Short Answer Question**

Consider Table numbers given in Figure 8 with three attributes:  $A$ ,  $B$  and  $C$ , where  $A$  is the primary key and  $C$  is the foreign key referencing  $A$ .

A	B	C
1	2	3
4	5	1
3	4	9
5	3	4
6	5	7
7	6	5
9	7	6

Figure 8: Table numbers

How many tuples will be left in the table if the tuple (1,2,3) is deleted from the table and ON DELETE CASCADE is applied?

**NOTE:** Enter your answer to the nearest integer.

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

0

**Question Number : 59 Question Type : SA**

**Correct Marks : 1.5**

**Question Label :** Short Answer Question

Consider a relation  $R(I,J,K,L,M)$  and an associated set of functional dependencies  $\mathcal{F} = \{I \rightarrow JK, KL \rightarrow M, J \rightarrow L, M \rightarrow I\}$ .

Consider the decomposition(s) of  $R$  into smaller relations, each of which is in BCNF. From among all such possible decompositions, let  $D$  be a decomposition with minimum number of relations. What is the number of relations in  $D$ ?

**NOTE:** Enter your answer to the nearest integer.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

2

**Question Number : 60 Question Type : SA**

**Correct Marks : 1**

**Question Label :** Short Answer Question

What is the length of the shortest strings that can match the given regular expression '`%_PI%_U_%`' ?

**NOTE:** Enter your answer to the nearest integer.

**Response Type :** Numeric

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

6

**Question Number : 61 Question Type : SA**

**Correct Marks : 1**

Question Label : Short Answer Question

Consider a relation  $R(M, N, O, P)$  and an associated functional dependency set  $\mathcal{F} = \{M \rightarrow N, O \rightarrow N, P \rightarrow MNO, MO \rightarrow P\}$ .

How many functional dependencies of the form  $\alpha \rightarrow \beta$ , where  $\beta$  is an atomic attribute, must be removed from  $\mathcal{F}$  in order to get a canonical cover of  $\mathcal{F}$ ?

**NOTE:** Enter your answer to the nearest integer.

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

1

**Question Number : 62 Question Type : SA**

**Correct Marks : 2**

Question Label : Short Answer Question

What is the number of schedules which are view equivalent to the given schedule S?

T1	T2	T3
$R(A)$ $w(B)$		
	$w(B)$ $R(A)$	
		$R(C)$ $w(B)$

Figure 9: Schedule S

**NOTE:** Enter your answer to the nearest integer.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

11

**Question Type : COMPREHENSION**

**Question Numbers : (63 to 64)**

Question Label : Comprehension

Consider the information given on relation project and relation allotment in Table 1, and answer the given sub questions

Relation	Number of records	Number of blocks
project	2,000	200
allotment	9,000	600

Table 1: Information on project and allotment

**Sub questions**

**Question Number : 63 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Consider worst-case memory availability. Assuming **allotment** as outer relation, identify the correct cost estimate for the **nested-loop join** of **allotment** and **project**.

**Options :**

- A. ❌ 1,200,200 block transfers and 2,200 seeks
- B. ✓ 1,800,600 block transfers and 9,600 seeks
- C. ❌ 120,200 block transfers and 400 seeks
- D. ❌ 120,600 block transfers and 1200 seeks

**Question Number : 64 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Consider worst-case memory availability. Assuming **allotment** as outer relation, identify the correct cost estimate for block **nested-loop join** of **allotment** and **project**.

**Options :**

- A. ❌ 1,200,200 block transfers and 2,200 seeks
- B. ❌ 1,800,600 block transfers and 9,600 seeks
- C. ❌ 120,200 block transfers and 400 seeks
- D. ✓ 120,600 block transfers and 1200 seeks

**Question Type : COMPREHENSION**

**Question Numbers : (65 to 66)**

Question Label : Comprehension

XYZ is a renowned hospital that has many blocks within its boundaries. Each block will be served by a preassigned group of nurses identified by a group\_id. But the nurses are not assigned to any specific room within the block, therefore each nurse in that group can serve one or more rooms in that block. Each room number is unique only within a block. The number of beds in a given room is always fixed.

Assume that the hospital stores its operational data in a single table which is in 1NF, given as below:

Nursing\_Schedule(*block\_number*, *room\_number*, *group\_id*, *nurse\_id*, *no\_of\_beds*)

*Note: Please read the question carefully and frame the dependencies strictly on the basis of given constraints.*

Based on the above data, answer the given subquestions.

### **Sub questions**

**Question Number : 65 Question Type : MSQ**

**Correct Marks : 1**

Question Label : Multiple Select Question

Choose all the prime attributes for the given table taking into consideration the given constraints.

#### **Options :**

A. ✓ *block\_number*

B. ✓ *nurse\_id*

C. ✗ *group\_id*

D. ✓ *room\_number*

E. ✗ *no\_of\_beds*

**Question Number : 66 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Choose the lowest normal form which the **Nursing\_Schedule** table does not satisfy.

**Options :**

A. ❌ 1NF

B. ✓ 2NF

C. ❌ 3NF

D. ❌ BCNF

**Question Type : COMPREHENSION**

**Question Numbers : (67 to 68)**

Question Label : Comprehension

Consider the following schema, and answer the given subquestions

**Students**(sid, sname, age, department)

**Books**(bid, bname, author)

**Book\_Issue**(sid, bid, date)

**Sub questions**

**Question Number : 67 Question Type : MSQ**

**Correct Marks : 2**

Question Label : Multiple Select Question

Which of the following queries is/are equivalent to the statement given below?

- Find the names of students who have issued a book having author name 'S.K.Sharma'.

**Options :**

A. ✓  $\{P | \exists S \in Students \ \exists I \in Book\_Issue (I.sid = S.sid \wedge P.sname = S.sname \wedge \exists B \in Books (B.bid = I.bid \wedge B.author = 'S.K.Sharma'))\}$

B. ✓  $\{P | \exists S \in Students \ \exists I \in Book\_Issue \ \exists B \in Books (I.sid = S.sid \wedge B.bid = I.bid \wedge B.Author = 'S.K.Sharma' \wedge P.sname = S.sname)\}$

C. ✗  $\{\exists P | S \in Students, I \in Book\_Issue, B \in Books (I.sid = S.sid \wedge B.bid = I.bid \wedge B.Author = 'S.K.Sharma' \wedge P.sname = S.sname)\}$

D. ✗  $\{P | \exists S \in Students \ \exists I \in Book\_Issue (I.sid = S.sid \wedge P.sname = S.sname \wedge \exists B \in Books (B.author = 'S.K.Sharma'))\}$

**Question Number : 68 Question Type : MSQ**

**Correct Marks : 1.5**

Question Label : Multiple Select Question

Which of the following queries is/are equivalent to the statement given below?

- Find the name of students who have issued a book having bid 'SQL1992'.

**Options :**

A. ✓  $\prod_{sname} ((\sigma_{bid='SQL1992'} Book\_Issue) \bowtie Students)$

B. ✗  $\prod_{sname} ((\sigma_{bid='SQL1992'} Books) \bowtie Students)$

C. ✗  $\prod_{sname} (\sigma_{bid='SQL1992'} (Books \bowtie Students))$

D. ✓  $\Pi_{sname}(\sigma_{bid='SQL1992'}(Book\_Issue \bowtie Students))$

## BDM

**Number of Questions :** 35

**Section Marks :** 120

**Question Number : 69 Question Type : MCQ**

**Correct Marks : 0**

Question Label : Multiple Choice Question

**THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL: BUSINESS DATA MANAGEMENT"**

**ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?**

**CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.**

**(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)**

**Options :**

A. ✓ YES

B. ✗ NO

**Question Number : 70 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

When the Marginal Utility is 0

**Options :**

A. ✓ Total utility is maximum

B. ✗ Total utility is minimum

- C. ✘ Total utility is unaffected
- D. ✘ Total utility declines

**Question Number : 71 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Which of the following is not a source of survey data? (select all that is applicable)

**Options :**

- A. ✓ Stock market data
- B. ✘ Market research data
- C. ✘ Consumer pyramid data
- D. ✘ None of these

**Question Number : 72 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Supply is elastic, if

**Options :**

- A. ✓ A 1 percentage change in price causes a 1.5 percentage change in quantity supplied
- B. ✘ A 1 percent change in price causes a 0.5 percentage change in quantity supplied
- C. ✘ A 1 percentage change in price causes a -1.5 percentage change in quantity demanded
- D. ✘ A 1 percentage change in price causes a -0.5-percentage change in quantity demanded

**Question Number : 73 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

A product is likely to have a price elasticity of demand that exceeds 1 when

**Options :**

- A. ✘ Its price falls
- B. ✘ It is a necessity

- C. ✓ It has close substitutes
- D. ✗ The percentage of income spent on it decreases

### Question Number : 74 Question Type : MCQ

**Correct Marks : 1**

Question Label : Multiple Choice Question

If a firm has an Acid Test of 2:1, then

**Options :**

- A. ✓ The firm is a healthy firm as it has more cash on hand than it owes
- B. ✗ The firm is suffering as it has more dues than it can handle
- C. ✗ The current assets are less than the stocks and hence the firm is in trouble
- D. ✗ Cannot say without the financial statement

### Question Number : 75 Question Type : MCQ

**Correct Marks : 1**

Question Label : Multiple Choice Question

In which industry is the value addition in terms of production process not high?

**Options :**

- A. ✓ Basic industries
- B. ✗ Capital-intensive industries
- C. ✗ Labour-intensive industries
- D. ✗ None of these

### Question Number : 76 Question Type : MCQ

**Correct Marks : 1**

Question Label : Multiple Choice Question

In India, the data on various industries is collected by?

**Options :**

- A. ✓ Central statistical office
- B. ✗ Central statistical institute

- C. ✘ NITI Aayog
- D. ✘ Society of Indian Automobile Manufacturers

**Question Number : 77 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Which of the following principles are widely used in propensity models?

**Options :**

- A. ✘ Microeconomics
- B. ✘ Macroeconomics
- C. ✓ Nudge economics
- D. ✘ Working capital
- E. ✘ Credit economics

**Question Number : 78 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Which of the following statements is always true?

**Options :**

- A. ✘ Current ratio < Quick ratio
- B. ✘ Current ratio < 0
- C. ✓ Current ratio  $\geq$  Quick ratio
- D. ✘ Current ratio = Quick ratio

**Question Number : 79 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Which of the following financial statements contains 'Long term borrowings'?

**Options :**

- A. ✓ Balance sheet

B. ✘ Profit & loss account

**Question Number : 80 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

Match the “Definition” in Column-X to its appropriate “Ratio” in Column-Y

Column-X	Column-Y
1. The ability of the firm to pay its way	A. Profitability Ratio
2. Information to enable decisions to be made on the extent of risk and earning potential of a business investment	B. Gearing Ratio
3. Information on relationship between the exposure of the business to loans as opposed to share capital	C. Investment Ratio
4. How effective the firm is at generating profits given sales and/or its capital assets	D. Financial Ratio
	E. Liquidity Ratio

**Options :**

A. ✓ 1-E, 2-C, 3-B, 4-A

B. ✘ 1-E, 2-C, 3-B, 4-D

C. ✘ 1-B, 2-C, 3-E, 4-A

D. ✘ 1-B, 2-C, 3-E, 4-D

**Question Number : 81 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

In designing a ledger for the e-commerce analysis, can the Open Stock of Mother DC be negative when we accept backorders? .

**Options :**

A. ✓ TRUE

B. ✗ FALSE

**Question Number : 82 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

A customer makes a transaction through an online payments platform 'PayPhone' using 'Katak Bank Credit Card' in Amazon to buy a shoe. Which of the following is true chronologically?

**Options :**

- A. ✗ Customer pays Katak, Katak pays Amazon
- B. ✗ Customer pays Katak, Katak pays PayPhone, PayPhone pays Amazon
- C. ✓ Katak pays PayPhone, PayPhone pays Amazon, Customer pays Katak
- D. ✗ Customer pays PayPhone, PayPhone pays Katak, Katak pays Amazon
- E. ✗ Customer pays Amazon

**Question Number : 83 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

Which of the following describes A/B test?

**Options :**

- A. ✓ 2 small counties in the US shown 2 different layouts of a website to browse
- B. ✗ Entire US shown 2 different layouts of a website to browse
- C. ✗ US is shown one version of the website and UK is shown another version of the website to browse
- D. ✗ Both US and UK are shown both the versions of the website to the same people one after the other
- E. ✗ All of these

**Question Number : 84 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

If a FinTech company wants to cut down losses, which of the following should they do?

**Options :**

- A. ✓ Increase approval cutoff of credit score
- B. ✗ Decrease approval cutoff of credit score
- C. ✗ Increase interest rate
- D. ✗ Increase approval limit for loans
- E. ✗ Give more loans

**Question Number : 85 Question Type : MSQ**

**Correct Marks : 2**

Question Label : Multiple Select Question

If the current ratio is 2:1 and the Quick ratio is 1.5:1, then which of the following is/are true? (Select all that are applicable)

**Options :**

- A. ✓ Current assets are 2 times the liability
- B. ✓ Stocks is 0.5 times the liability
- C. ✓ Current assets are greater than stocks
- D. ✗ None of these

**Question Number : 86 Question Type : MSQ**

**Correct Marks : 2**

Question Label : Multiple Select Question

Which of the following is/are not a “head” in which an Industry is classified in the Indian context?(Select all that are applicable)

**Options :**

- A. ✗ Labour
- B. ✗ Raw Material
- C. ✗ Ownership
- D. ✓ Agro based
- E. ✓ Consumer

**Question Number : 87 Question Type : MSQ****Correct Marks : 2**

Question Label : Multiple Select Question

Which of the following statements are false?

**Options :**

- A. ✘ Earnings per share can be negative
- B. ✓ Return on capital employed is always positive
- C. ✓ Current ratio can be negative
- D. ✘ Return on assets can be negative

**Question Number : 88 Question Type : MCQ****Correct Marks : 5**

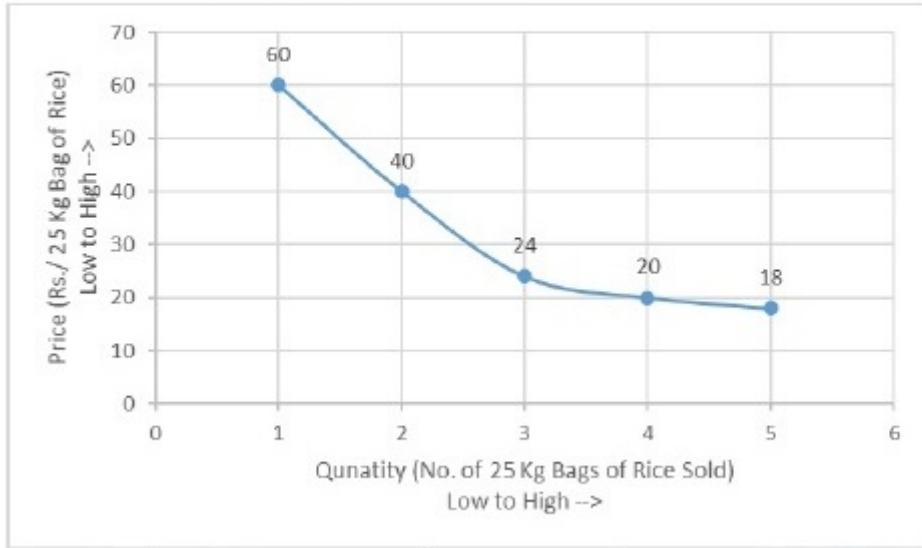
Question Label : Multiple Choice Question

The table provides data on rice sold (25Kg Bags) and price (Rs./ 25Kg Bag) at a rice wholesaler for the first 5 months of the year. Then answer the given question : (*Hint: round your price elasticity calculations to 1 decimal place*)?

Month	Price Per 25 Kg Bag of Rice	Number of 25Kg Bags of Rice Sold
1	45	300
2	47	280
3	50	270
4	52	259
5	55	240

The graph given below most closely depicts the appropriate price elasticity between which two months? (Select all that are applicable)

[Note: Do the graph computations for two consecutive points at a time]



**Options :**

- A. ❌ Month-1 and Month-2
- B. ✓ Month-2 and Month-3
- C. ❌ Month-3 and Month-4
- D. ❌ Month-4 and Month-5

**Question Number : 89 Question Type : MCQ**

**Correct Marks : 5**

Question Label : Multiple Choice Question

PayBuddy conducted an A/B test to understand if their new Funding Instrument recommendation strategy works well. The control and test population size were equal in number. Following are the details of the control and treatment groups. From the given table, which of the following statements are true?

- i. Credit transactions increased with the new recommendation strategy
- ii. Debit transactions increased with the new recommendation strategy
- iii. Both Credit and Debit transactions increased with the new recommendation strategy
- iv. Credit transactions decreased with the new recommendation strategy
- v. Debit transactions decreased with the new recommendation strategy

Group	Average sum of credit transactions per customer	Average sum of debit transactions per customer
Treatment	1725 \$	2780 \$
Control	1810 \$	2679 \$

**Options :**

- A. ✗ Both (i) & (v)
- B. ✓ Both (ii) & (iv)
- C. ✗ Only (iii)
- D. ✗ Only (i)
- E. ✗ Only (v)

**Question Number : 90 Question Type : MSQ**

**Correct Marks : 5**

Question Label : Multiple Select Question

The table provides data on rice sold (25Kg Bags) and price (Rs./ 25Kg Bag) at a rice wholesaler for the first 5 months of the year. Then answer the given question : (Hint: round your price elasticity calculations to 1 decimal place)?

Month	Price Per 25 Kg Bag of Rice	Number of 25Kg Bags of Rice Sold
1	45	300
2	47	280
3	50	270
4	52	259
5	55	240

The graph given in Figure 1 most closely depicts the appropriate price elasticity between which two months? (Select all that are applicable)

[Note: Do the graph computations for two consecutive points at a time]

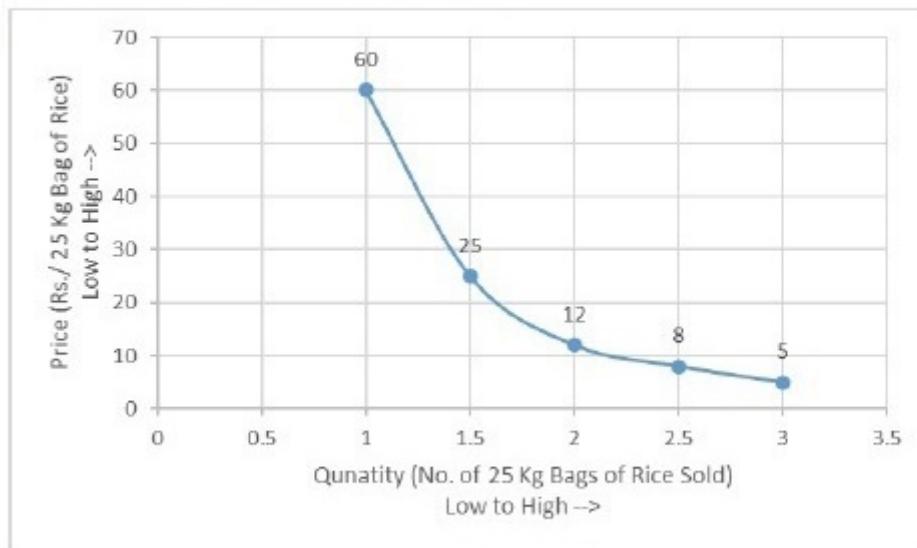


Figure 1

#### Options :

- A. ✓ Month-1 and Month-2
- B. ✗ Month-2 and Month-3
- C. ✗ Month-3 and Month-4
- D. ✓ Month-4 and Month-5

Question Number : 91 Question Type : SA

Correct Marks : 5

**Question Label :** Short Answer Question

From the table, calculate the revenue growth on 11. April 2021 with respect to 10. April 2021

Date	Revenue
01 April 2021	₹ 28,52,404
02 April 2021	₹ 27,08,802
03 April 2021	₹ 27,43,849
04 April 2021	₹ 31,12,277
05 April 2021	₹ 31,57,606
06 April 2021	₹ 30,43,087
07 April 2021	₹ 29,56,175
08 April 2021	₹ 27,30,834
09 April 2021	₹ 28,05,271
10 April 2021	₹ 26,08,451
11 April 2021	₹ 29,63,639
12 April 2021	₹ 29,44,822
13 April 2021	₹ 28,12,689
14 April 2021	₹ 27,44,763
15 April 2021	₹ 27,89,945

**NOTE:** Enter your answer in one decimal place.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

13.4 to 13.8

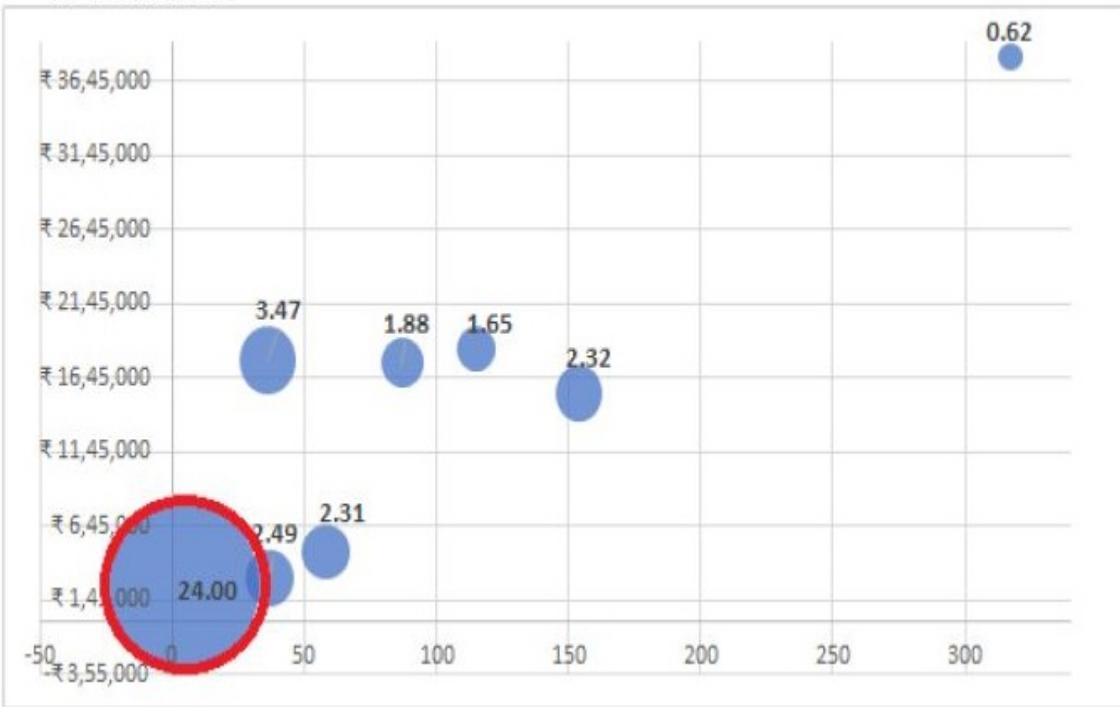
**Question Number : 92 Question Type : MCQ**

**Correct Marks : 6**

**Question Label :** Multiple Choice Question

The figure represents a bubble chart for mobiles, where X-axis represents the Volumes, Y-axis represents the Revenues, and the size of the bubble represents the average days of inventory.

Select the option/s that is/are wrong:



#### Options :

- A. ✓ Reduce the inventory for the SKU with 24 as average days of inventory
- B. ✗ Increase the inventory for the SKU with 24 as average days of inventory
- C. ✗ SKU with 24 is an Outlier and hence remove it from analysis.
- D. ✗ Both Reduce the inventory for the SKU with 24 as average days of inventory and SKU with 24 is an Outlier and hence remove it from analysis.

**Question Number : 93 Question Type : MCQ**

**Correct Marks : 6**

Question Label : Multiple Choice Question

Consider the dataset.

Candidates	F1: Year of experience	F2: Count Skill	F3: Count_key_projects	F4: When will be available to join (months)
Partha	5.0	2	2	2
Siva	5.0	1	1	2
Akanksha	5.5	1	2	2
Lavanya	6.0	1	1	3

Here the factors F1 ..F3 are “more the better”, but, F3 is “lower the better”. Rank the above candidates and choose the correct ranking from the below options.

#### Options :

A. ✓ Partha > Akanksha > Siva > Lavanya

B. ✗ Akanksha > Lavanya > Siva> Partha

C. ✗ Partha < Akanksha < Lavanya < Siva

D. ✗ Akanksha < Lavanya < Siva< Partha

## Question Type : COMPREHENSION

### Question Numbers : (94 to 95)

Question Label : Comprehension

Using the data in table , interpret the figure (assume all units produced are sold) and answer the given subQuestions .

Fixed Cost (Rs.)	Variable Cost (Rs./ unit)	Number of Units Produced (units)	Selling price (Rs./ unit)
5000	0	0	100
5000	20	200	100
5000	40	300	100
5000	45	320	100
5000	49	345	100
5000	53	370	100

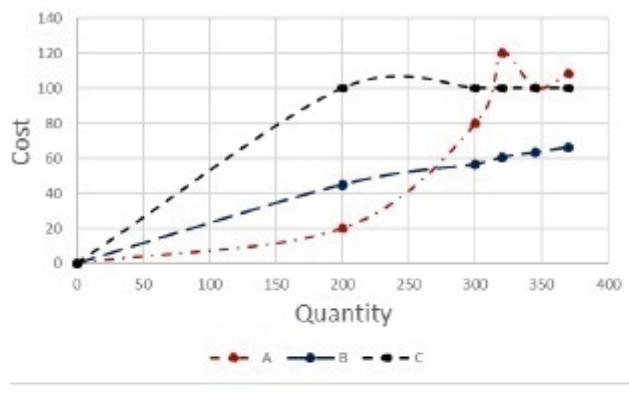
### Sub questions

### Question Number : 94 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

Match the curve in column-A to its representative cost in column-B



Column-A	Column-B
I. Curve-A	a) Marginal cost
II. Curve-B	b) Marginal revenue
III. Curve-C	c) Avg. total cost
IV. None of these	

**Options :**

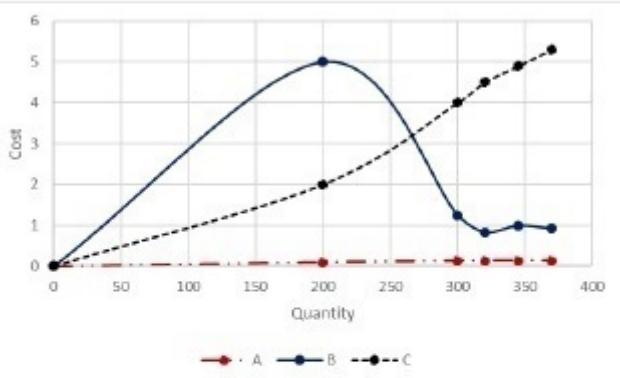
- A. ✓ I-(a), II-(c), III-(b)
- B. ✗ II-(a), I-(c), III-(b)
- C. ✗ III-(a), II-(c), I-(b)
- D. ✗ IV-(a), III-(c), II-(b)

**Question Number : 95 Question Type : MCQ**

**Correct Marks : 3**

Question Label : Multiple Choice Question

Match the curve in column-A to its representative cost in column-B



Column-A	Column-B
I. Curve-A	a) Change in profit
II. Curve-B	b) Avg. variable cost
III. Curve-C	c) Avg. production cost
IV. None of these	

**Options :**

- A. ❌ I-(b), II-(c), III-(a)
- B. ❌ IV-(b), I-(c), III-(a)
- C. ❌ III-(b), II-(c), IV-(a)
- D. ✓ II-(b), IV-(c), I-(a)

**Question Type : COMPREHENSION**

**Question Numbers : (96 to 99)**

Question Label : Comprehension

Find the missing details in the following table by using Inventory Movement and Sales Data

**Table 1 – Inventory Movement for Quarter - 1**

	Apr-19	Apr-19		May-19		Jun-19	
	Beg. Invt.	Prdn. Oty	End Invt.	Prdn. Oty	End Invt.	Prdn. Oty	End Invt.
Gear Assembly 1	3210	7000	1250	9000	2290	9000	330
Gear Assembly 2	2230	6000	A	6000	1170	10000	190
Gear Assembly 3	1760	8000	3400	8000	360	2000	1400
Gear Assembly 4	3360	6000	2400	8000	B	10000	1177
Gear Assembly 5	970	3000	1090	4000	1135	4000	1580
Gear Assembly 6	5630	12000	3930	12000	6930	C	9830
Gear Assembly 7	2400	7000	2248	7000	1540	6000	934
Gear Assembly 8	860	3000	1940	4000	1380	4000	340

**Sales for Quarter 1**

Sales	Apr-19	May-19	Jun-19
	Quantity	Quantity	Quantity
Gear Assembly 1 (BS4)	8960 nos	7960 nos	10960 nos
Gear Assembly 2 (BS4)	7000 nos	6150 nos	10980 nos
Gear Assembly 3 (BS4/6)	6360 nos	11040 nos	960 nos
Gear Assembly 4 (BS4/6)	6960 nos	7748 nos	11475 nos
Gear Assembly 5 (BS4/6)	2880 nos	3955 nos	3555 nos
Gear Assembly 6 (BS4/6)	13700 nos	9000 nos	9100 nos
Gear Assembly 7 (BS4/6)	7152 nos	7708 nos	D
Gear Assembly 8 (BS4/6)	1920 nos	4560 nos	5040 nos

Based on the above data ,answer the given subquestions.

### **Sub questions**

**Question Number : 96 Question Type : SA**

**Correct Marks : 1**

**Question Label :** Short Answer Question

Enter the value of A

**NOTE:** Enter your answer to the nearest integer.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

1230

**Question Number : 97 Question Type : SA**

**Correct Marks : 1**

Question Label : Short Answer Question

Enter the value of B

**NOTE:** Enter your answer to the nearest integer.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

2652

**Question Number : 98 Question Type : SA**

**Correct Marks : 1**

Question Label : Short Answer Question

Enter the value of C

**NOTE:** Enter your answer to the nearest integer.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

12000

**Question Number : 99 Question Type : SA**

**Correct Marks : 1**

Question Label : Short Answer Question

Enter the value of D

**NOTE:** Enter your answer to the nearest integer.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

6606

**Question Type : COMPREHENSION**

**Question Numbers : (100 to 105)**

Question Label : Comprehension

Match the following.

1	Pareto Principle	a	Assets - Liabilities
2	Working Capital	b	With the available Open Stock, how many days of demand can be met?
3	Service Level	c	Average Open Stock divided by Average Sales
4	Backorder	d	The percentage of customers that do not face a stockout.
5	Average Days of Sale of Inventory	e	80:20 Analysis
6	Average Days of Inventory Cover	f	Accepting an order that is temporarily out of stock

Based on the above data ,answer the given subquestions.

### **Sub questions**

**Question Number : 100 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

Pareto Principle

**Options :**

- A. ❌ Assets - Liabilities
- B. ❌ With the available Open Stock, how many days of demand can be met?
- C. ❌ Average Open Stock divided by Average Sales
- D. ❌ The percentage of customers that do not face a stockout
- E. ✓ 80:20 Analysis
- F. ❌ Accepting an order that is temporarily out of stock

**Question Number : 101 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

Working Capital

**Options :**

- A. ✓ Assets - Liabilities
- B. ✗ With the available Open Stock, how many days of demand can be met?
- C. ✗ Average Open Stock divided by Average Sales
- D. ✗ The percentage of customers that do not face a stockout
- E. ✗ 80:20 Analysis
- F. ✗ Accepting an order that is temporarily out of stock

**Question Number : 102 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

Service Level

**Options :**

- A. ✗ Assets - Liabilities
- B. ✗ With the available Open Stock, how many days of demand can be met?
- C. ✗ Average Open Stock divided by Average Sales
- D. ✓ The percentage of customers that do not face a stockout
- E. ✗ 80:20 Analysis
- F. ✗ Accepting an order that is temporarily out of stock

**Question Number : 103 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

Backorder

**Options :**

- A. ✗ Assets - Liabilities
- B. ✗ With the available Open Stock, how many days of demand can be met?
- C. ✗ Average Open Stock divided by Average Sales
- D. ✗ The percentage of customers that do not face a stockout

E. ✗ 80:20 Analysis

F. ✓ Accepting an order that is temporarily out of stock

**Question Number : 104 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Average Days of Sale of Inventory

**Options :**

A. ✗ Assets - Liabilities

B. ✗ With the available Open Stock, how many days of demand can be met?

C. ✓ Average Open Stock divided by Average Sales

D. ✗ The percentage of customers that do not face a stockout

E. ✗ 80:20 Analysis

F. ✗ Accepting an order that is temporarily out of stock

**Question Number : 105 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

Average Days of Inventory Cover

**Options :**

A. ✗ Assets - Liabilities

B. ✓ With the available Open Stock, how many days of demand can be met?

C. ✗ Average Open Stock divided by Average Sales

D. ✗ The percentage of customers that do not face a stockout

E. ✗ 80:20 Analysis

F. ✗ Accepting an order that is temporarily out of stock

**Question Number : 106 Question Type : MCQ**

**Correct Marks : 10**

Question Label : Multiple Choice Question

What is the simplest and shortest function in **MS-EXCEL** and **Google Sheets** that would collate columns as found in **TABLE2** from **TABLE1**?

	A1	B1	C1	D1	E1	A2	B2	C2	D2	E2	A3	B3	C3	D3	E3	.	.	.	.	AN	BN	CN	DN	EN
R1																								
R2																								
R3																								
R4																								
R5																								
.																								
.																								
.																								
RN																								

	TABLE 2																								
R1																									
R2																									
R3																									
R4																									
R5																									
.																									
.																									
.																									
RN																									



**Options :**

- A. ✓ OFFSET only;
- B. ✗ COLUMNSEQ only;
- C. ✗ OFFSET and COLUMNSEQ,
- D. ✗ None of these

**Question Number : 107 Question Type : MCQ**

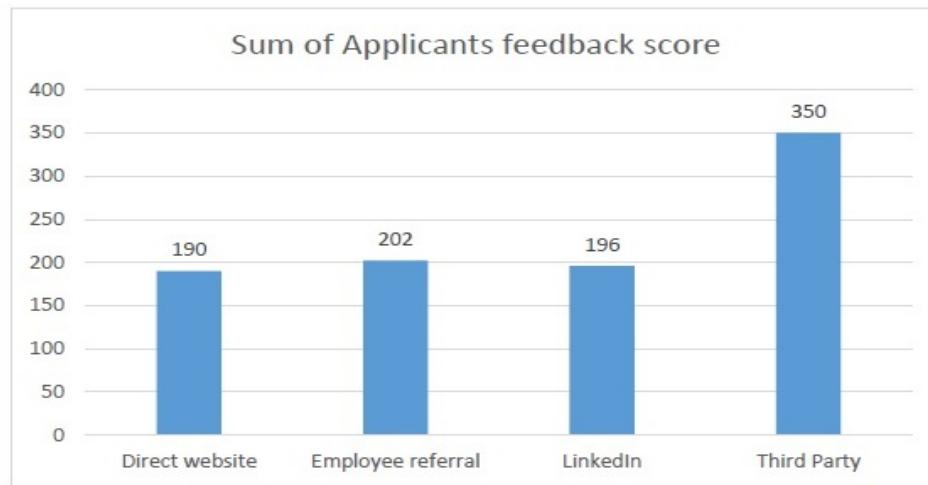
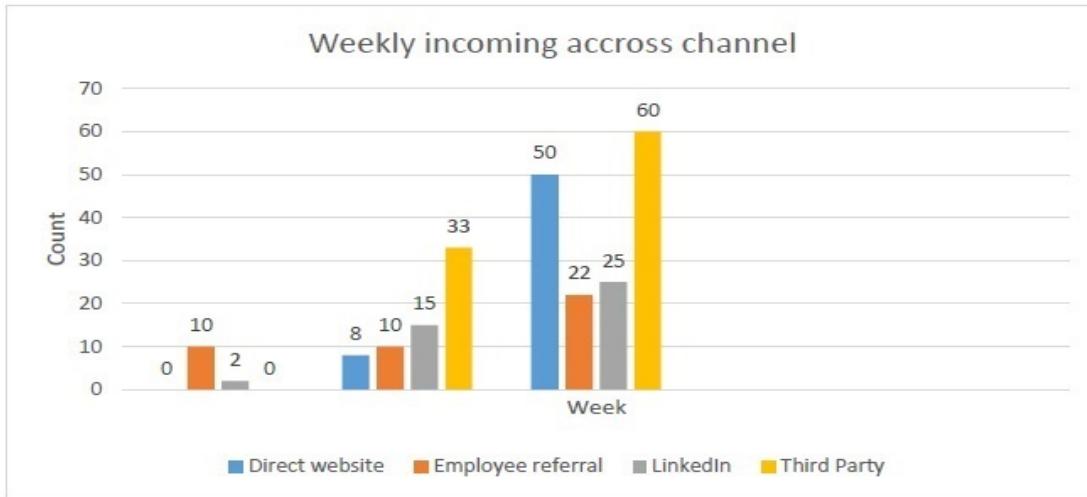
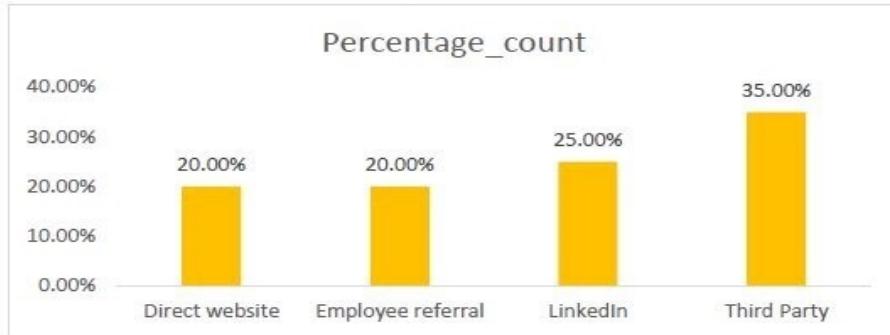
**Correct Marks : 10**

Question Label : Multiple Choice Question

Compare the effectiveness of the four channels. The criteria are:

- i. Average weekly incoming application count
- ii. Channel wise application count
- iii. Ease of applying feedback score per candidate

Following bar charts shows the distribution of data in the respective category:



### Options :

- A. ✓ Third party > Direct website > Employee referral > LinkedIn
- B. ✗ Third party < Direct website < Employee referral < LinkedIn
- C. ✗ Third party > LinkedIn > Direct website > Employee referral
- D. ✗ Third party > Direct website > LinkedIn > Employee referral

**Question Number : 108 Question Type : MCQ**

**Correct Marks : 3**

Question Label : Multiple Choice Question

What are the components of Overall Equipment Effectiveness (OEE)?

**Options :**

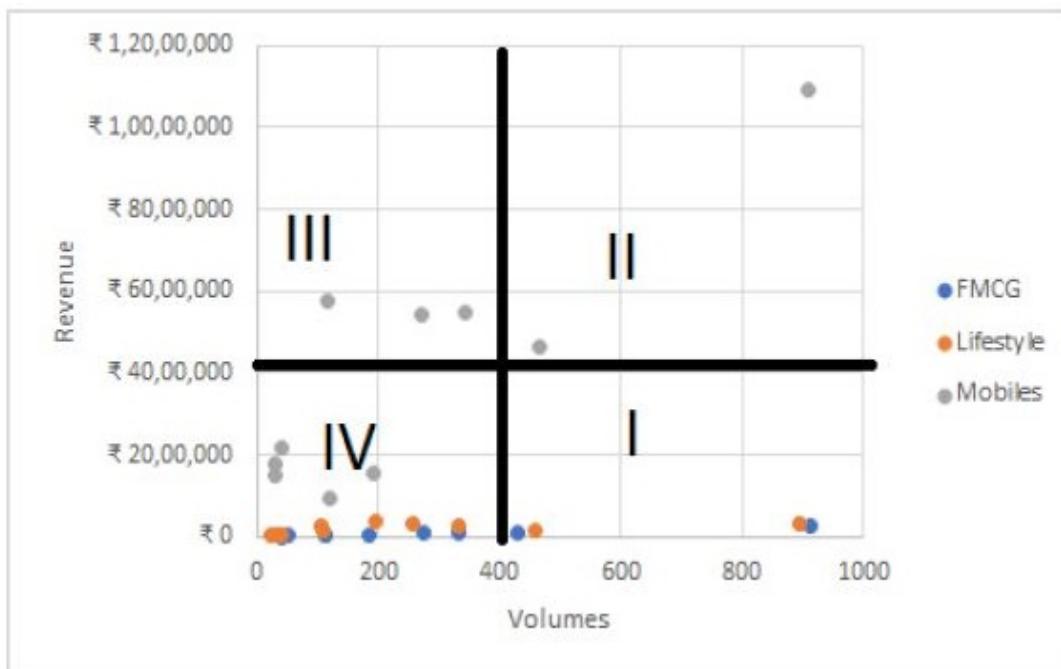
- A. ✘ availability, effectiveness, performance, excellence, objectivity, and quality
- B. ✘ Objectivity, effectiveness, and Excellence
- C. ✘ Objectivity, Performance, and Quality
- D. ✘ Availability, effectiveness, and Quality
- E. ✓ Availability, Performance, and Quality

**Question Number : 109 Question Type : MCQ**

**Correct Marks : 4**

Question Label : Multiple Choice Question

From the Figure, which quadrant products will be placed in the secure area?



**Options :**

- A. ✘ I & III
- B. ✓ III Only
- C. ✘ III & IV

**Question Number : 110 Question Type : MCQ****Correct Marks : 4**

Question Label : Multiple Choice Question

Arrange the following steps while working with unstructured data in a ranking modelling:

- i. Normalizing
- ii. Preprocessing
- iii. Ranking
- iv. Composite score

**Options :**

A. ❌ I --&gt; II --&gt; III --&gt; IV

B. ✓ II --&gt; I --&gt; IV --&gt; III

C. ❌ I --&gt; II --&gt; I --&gt; IV --&gt; III

D. ❌ I --&gt; II --&gt; I --&gt; III --&gt; IV

**Question Type : COMPREHENSION****Question Numbers : (111 to 114)**

Question Label : Comprehension

Match the following.

1. A form created by HR that outlines the budgetary details, skills and capabilities required etc.	a. Appraisal
2. Organization source talent by asking their existing employees to recommend candidates from their existing networks.	b. Indent
3. The process of evaluating an employee's current and/or past performance	c. Job description
4. A quick summary of what the role is expected to do, key responsibilities etc	d. Employee referral

Based on the above data ,answer the given subquestions..

**Sub questions**

**Question Number : 111 Question Type : MCQ****Correct Marks : 2**

Question Label : Multiple Choice Question

A form created by HR that outlines the budgetary details, skills and capabilities required etc.

**Options :**

- A. ❌ Appraisal
- B. ✓ Indent
- C. ❌ Job description
- D. ❌ Employee referral

**Question Number : 112 Question Type : MCQ****Correct Marks : 2**

Question Label : Multiple Choice Question

Organization source talent by asking their existing employees to recommend candidates from their existing networks.

**Options :**

- A. ❌ Appraisal
- B. ❌ Indent
- C. ❌ Job description
- D. ✓ Employee referral

**Question Number : 113 Question Type : MCQ****Correct Marks : 2**

Question Label : Multiple Choice Question

The process of evaluating an employee's current and/or past performance

**Options :**

- A. ✓ Appraisal
- B. ❌ Indent
- C. ❌ Job description

D. \* Employee referral

**Question Number : 114 Question Type : MCQ**

**Correct Marks : 2**

Question Label : Multiple Choice Question

A quick summary of what the role is expected to do, key responsibilities etc

**Options :**

- A. \* Appraisal
- B. \* Indent
- C. ✓ Job description
- D. \* Employee referral

**Question Type : COMPREHENSION**

**Question Numbers : (115 to 117)**

Question Label : Comprehension

You have the following data for a firm X in the year 2020.

Current assets	25000
Total assets	65000
Current liabilities	30000
Profit	-6000
Inventory	4500

Based on the above data ,answer the given subquestions.

**Sub questions**

**Question Number : 115 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

What is the current ratio?

**Options :**

- A. ✗ -0.83
- B. ✗ 0.48
- C. ✓ 0.83
- D. ✗ -0.48

**Question Number : 116 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

What is the quick ratio?

**Options :**

- A. ✗ -0.68
- B. ✗ 0.83
- C. ✓ 0.68
- D. ✗ -0.83

**Question Number : 117 Question Type : MCQ**

**Correct Marks : 1**

Question Label : Multiple Choice Question

What is the return on capital employed (%)?

**Options :**

- A. ✗ 17%
- B. ✗ 117%
- C. ✗ 0.34%
- D. ✓ -17%