

6406531561894. ✖ Name of the designation with salary more than 80000.

PDSA

Section Id :	64065330332
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065367674
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 86 Question Id : 640653470012 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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 :

6406531561911. ✓ YES

6406531561912. ✗ NO

Sub-Section Number : 2
Sub-Section Id : 64065367675
Question Shuffling Allowed : Yes
Is Section Default? : null

Question Number : 87 Question Id : 640653470013 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

$$f1(n) = 3n^2 + 2n$$

$$f2(n) = 3n + (\log n)^2$$

$$f3(n) = \log(\log n)$$

$$f4(n) = 10 \log n$$

$$f5(n) = 3n \log n$$

Arrange the above functions in increasing order of asymptotic complexity.

Options :

6406531561913. ✗ $f3(n), f4(n), f2(n), f1(n), f5(n)$

6406531561914. ✗ $f3(n), f2(n), f1(n), f5(n), f4(n)$

6406531561915. ✗ $f4(n), f3(n), f2(n), f1(n), f5(n)$

6406531561916. ✓ $f_3(n), f_4(n), f_2(n), f_5(n), f_1(n)$

Sub-Section Number : 3
Sub-Section Id : 64065367676
Question Shuffling Allowed : Yes
Is Section Default? : null

Question Number : 88 Question Id : 640653470014 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Given the following sorted list :

[16, 53, 59, 81, 94, 99, 121, 150, 162, 170]

If we use binary search algorithm to search the element 99 in the list, then which of the following option corresponds to the correct sequence of comparison done in this process ?

Note: Assume here binary search will compute the midpoint by using $(firstindex + lastindex) // 2$

Options :

6406531561917. ✗ 94, 99

6406531561918. ✗ 16, 99

6406531561919. ✗ 94, 150, 121, 99

6406531561920. ✓ 94, 150, 99

6406531561921. ✗ None of these

Question Number : 89 Question Id : 640653470015 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

A list of n strings, each of length n is sorted in **lexicographical order** using the Merge Sort algorithm. What is its time complexity? (Assume that comparing strings lexicographically takes $O(n)$)

Options :

6406531561922. ✖ $O(n \log n)$

6406531561923. ✔ $O(n^2 \log n)$

6406531561924. ✖ $O(n^2)$

6406531561925. ✖ $O(\log n)$

Question Number : 90 Question Id : 640653470016 Question Type : MCQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

4 sorted lists each of length $n/2$ are merged into a single sorted list of $2n$ elements using two way merging. What will be the minimum number of element comparisons needed for this process ?

Options :

6406531561926. ✖ $n - 1$

6406531561927. ✖ $2n - 1$

6406531561928. ✔ $4n - 3$

6406531561929. ✖ $4n - 1$

Question Number : 91 Question Id : 640653470017 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Select the most appropriate data structure for the following applications.

Application	Data Structure
1. To implement undo - redo operations in a text editor	a. Array
2. Matrix operations	b. Graph
3. To implement a music playlist feature which plays songs in sequence	c. Stack
4. To represent communication networks	d. Queue

Options :

6406531561930. ✖ 1-d, 2-a, 3-c, 4-b

6406531561931. ✖ 1-d, 2-b, 3-c, 4-a

6406531561932. ✖ 1-d, 2-a, 3-b, 4-c

6406531561933. ✔ 1-c, 2-a, 3-d, 4-b

Question Number : 92 Question Id : 640653470019 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider that **Quick sort** is applied on a list of size n which is already sorted. What will be the asymptotic running time of Quick sort if the pivot is taken to be

I) Middle element II) Last element

Choose the correct option corresponding to the correct pair of complexities for both pivots.

Options :

6406531561935. ✖ $I : O(n^2)$ and $II : O(n \log n)$

6406531561936. ✖ $I : O(n^2)$ and $II : O(n)$

6406531561937. ✖ $I : O(n \log n)$ and $II : O(n \log n)$

6406531561938. ✔ $I : O(n \log n)$ and $II : O(n^2)$

Question Number : 93 Question Id : 640653470020 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Assume `s` is a stack and `q` is a queue. `Push` and `Pop` operations are usual stack operations, `Enqueue` and `Dequeue` are usual queue operations and `isEmpty()` is a method which returns true if either the stack or the queue are empty.

Now consider the function `fun` given below:

```
1 def fun(q):
2     while(!q.isEmpty()):
3         temp = q.Dequeue()
4         s.Push(temp)
5     while(!s.isEmpty()):
6         temp = s.Pop()
7         q.Enqueue(temp)
```

Suppose the initial content of the queue `q` is `[26, 78, 45, 10, 19, 56]` and the stack `s` is empty initially. If `fun` is invoked on `q` then what will be the content of `q` after `fun` finishes its execution?

Options :

6406531561939. ✖ `[26, 78, 45, 10, 19, 56]`

6406531561940. ✖ `[56, 19, 10, 26, 78, 45]`

6406531561941. ✓ [56, 19, 10, 45, 78, 26]

6406531561942. ✖ None of these

Question Number : 94 Question Id : 640653470022 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following function:

```
1 def fun(n):
2     total = 0
3     for i in range(n//2, n):
4         j = 2
5         while(j <= n):
6             total = total + n/2
7             j = j * 2
8     return total
```

Which of the following option correctly mentions the return value (total) of function fun in terms of n ? Consider that input $n = 2^k$ where k is a positive integer.

Options :

6406531561948. ✖ n^2

6406531561949. ✖ $(\log n)^2/4$

6406531561950. ✖ $(n \log n)/2$

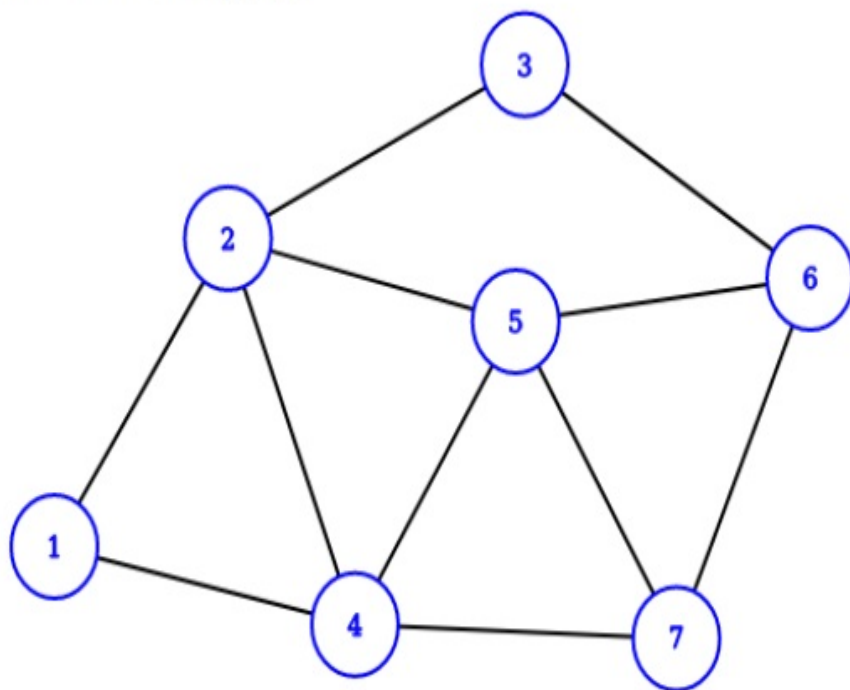
6406531561951. ✓ $(n^2 \log n)/4$

Question Number : 95 Question Id : 640653470025 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following graph



Which of the following vertex sequence/(s) are possible **BFS traversals** on the graph started from node 5?

Note : When a node has multiple neighbours, BFS would visit the numerically smaller valued node first.

Options :

6406531561957. ✓ 5,2,4,6,7,1,3

6406531561958. ✗ 5,2,3,1,4,7,6

6406531561959. ✗ 5,2,1,4,7,6,3

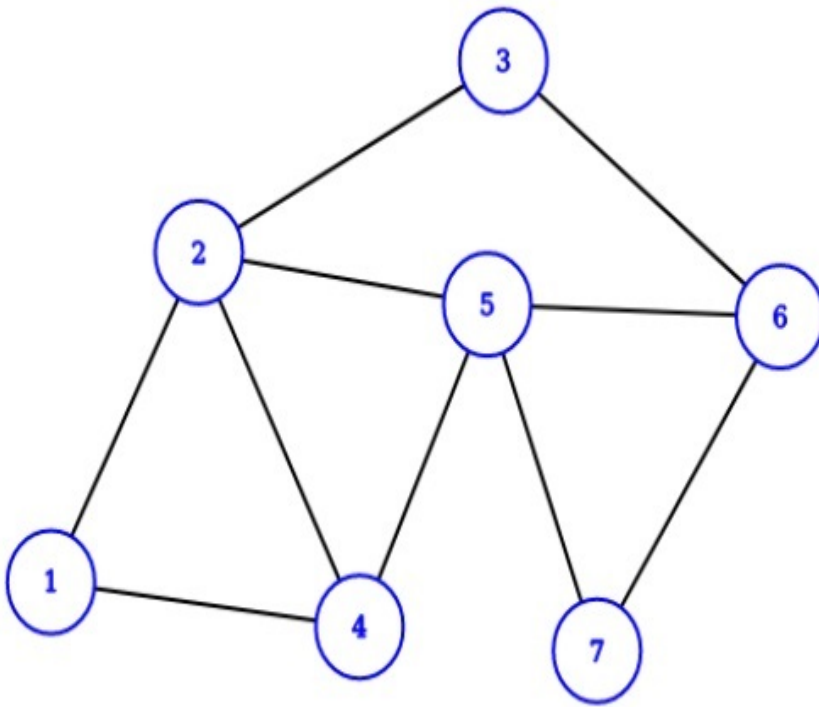
6406531561960. ✗ 5,2,1,3,4,6,7

Question Number : 96 Question Id : 640653470026 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following graph



DFS algorithm is applied starting from vertex **5** on the given graph. What will be the maximum possible height till which the stack will grow while making the DFS traversal ?

Note : When a node has multiple neighbours, DFS would visit the numerically smaller valued node first.

Options :

6406531561961. ✖ 3

6406531561962. ✖ 4

6406531561963. ✔ 5

6406531561964. ✖ 6

6406531561965. ✖ 7

Sub-Section Number :

4

Sub-Section Id :

64065367677

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 97 Question Id : 640653470018 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

Consider the following input list:

[38, 28, 43, 22, 112, 33, 39]

What will be the number of swaps that the following **Insertion sort** will make to sort this given list?

```
1 def insertionsort(L):
2     n = len(L)
3     if n < 1:
4         return(L)
5     for i in range(n):
6         j = i
7         while(j > 0 and L[j] < L[j-1]):
8             (L[j],L[j-1]) = (L[j-1],L[j])
9             j = j-1
10    return(L)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

9

Question Number : 98 **Question Id :** 640653470023 **Question Type :** SA **Calculator :** None

Response Time : N.A **Think Time :** N.A **Minimum Instruction Time :** 0

Correct Marks : 4

Question Label : Short Answer Question

Linear probing is an open addressing scheme in computer programming for resolving hash collisions in hash tables. Linear probing takes the original hash index and increments the value by 1 until a free slot is found.

A hash table contains 8 buckets indexed from 0 to 7 and uses linear probing to resolve collisions. The key values are integers and the hash function used is $\text{key mod } 8$. If key values 91, 27, 16, 64, 41 are inserted in to the table in the given order, in what location would the key value 160 be inserted after them?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

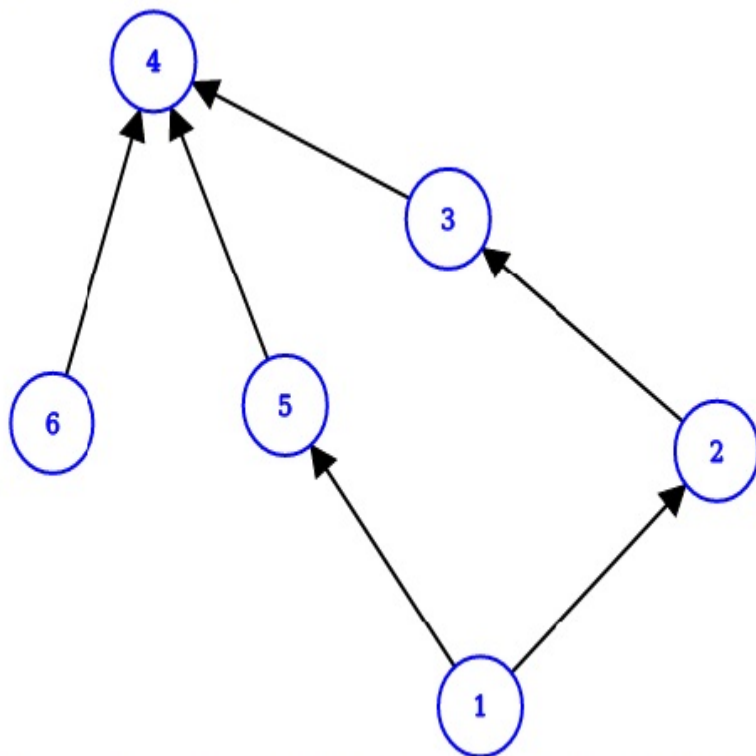
Question Number : 99 Question Id : 640653470027 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

Consider the following graph



The number of different **topological orderings** possible for this DAG starting from vertex 1 is ____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

12

Sub-Section Number :

Sub-Section Id : 64065367678
Question Shuffling Allowed : Yes
Is Section Default? : null

Question Number : 100 Question Id : 640653470021 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

```
1 class Node:
2     def __init__(self, data):
3         self.data = data
4         self.next = None
```

Consider an implementation of a **singly linked list** where each node is created using the given class `Node`. Suppose it has a `head` pointer that points to the first node of the linked list and a `tail` pointer that points to the last element of the linked list.

Which of the following operation can be implemented in constant ($O(1)$) time with given representation of the linked list ?

Options :

- 6406531561943. ✓ Insertion of the new node at the front of the linked list.
- 6406531561944. ✓ Insertion of the new node at the end of the linked list.
- 6406531561945. ✓ Deletion of the first node of the linked list.
- 6406531561946. ✗ Deletion of the last node of the linked list.
- 6406531561947. ✓ Deletion of the second node (from starting) of the linked list

Question Number : 101 Question Id : 640653470024 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following is/are possible degree sequence/(s) of vertices of a connected undirected graph with six vertices?

Note: Degree sequence is a series of positive integer a_1, a_2, \dots, a_n where each a_i is the degree of the i^{th} vertex of the graph.

Options :

6406531561953. ✖ 1,1,1,1,1,1

6406531561954. ✔ 2,2,2,2,2,2

6406531561955. ✔ 1,1,2,2,3,5

6406531561956. ✖ 1,2,2,2,3,3

Question Number : 102 Question Id : 640653470028 Question Type : MSQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Selectable Option : 0

Question Label : Multiple Select Question

Which of the following statement(s) is/are **true** about **Depth First Search (DFS)** on an undirected and connected graph?

Options :

6406531561967. ✔ DFS can be used to detect cycles in the graph.

6406531561968. ✔ DFS can be used to identify connected components in an undirected graph.

6406531561969. ✔ Using an adjacency list instead of an adjacency matrix can improve the worst case complexity to $O(V + E)$, where V is number of vertices and E is number of edges.

6406531561970. ✖ In an unweighted graph, DFS can be used to identify the shortest path from a starting vertex s to every other vertex in the graph

6406531561971. ✔ DFS always produces the same number of tree edges irrespective of the order in which the vertices are considered for DFS.

AppDev1

Section Id :	64065330333
Section Number :	7
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	64065367679
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 103 Question Id : 640653470029 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MODERN APPLICATION DEVELOPMENT I"

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