6406532733707. ✖ $\{M|\exists P \in Points\_Table(P.Country =' Spain' \wedge P.Losses >= 2 \wedge P.Draw <= 3)\}$

PDSA

Section Id :	64065356693
Section Number :	8
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	24
Number of Questions to be attempted :	24
Section Marks :	100
Display Number Panel :	Yes
Section Negative Marks :	0
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 :	640653118923
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 226 Question Id : 640653816096 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 (COMPUTER BASED EXAM)"

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 :

6406532733708. ✔ YES

6406532733709. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	640653118924
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 227 Question Id : 640653816097 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Here is a function to return the maximum value in a list of integers. There is a logical error in this function.

```
def max_bad(L):
    mymax = 0
    for i in range(len(L)):
        if L[i] > mymax:
            mymax = L[i]
    return(mymax)
```

Select the input list for which `max_bad` produces incorrect output.

Options :

6406532733710.

✖ `[11,22,33,44]`

6406532733711. ✖ `[-11,0,21,-32]`

6406532733712. ✔ `[-11,-22,-33,-44]`

6406532733713. ✖ `[44,33,22,11]`

Question Number : 228 Question Id : 640653816098 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

$f1(n) = O(\log n)$

$f2(n) = O(1)$

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

$f4(n) = O(\sqrt{n})$

$f5(n) = O(n^k)$

Arrange the above functions in **increasing** order of asymptotic complexity.

Options :

6406532733714. ✖ $f1(n), f2(n), f4(n), f3(n), f5(n)$

6406532733715. ✖ $f1(n), f2(n), f3(n), f4(n), f5(n)$

6406532733716. ✔ $f2(n), f1(n), f4(n), f3(n), f5(n)$

6406532733717. ✖ $f2(n), f1(n), f3(n), f4(n), f5(n)$

Question Number : 229 Question Id : 640653816099 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

How many swaps does selection sort require, in the worst case, on an input of size `n`?

Options :

6406532733718. ✖ $O(log\ n)$

6406532733719. ✔ $O(n)$

6406532733720. ✖ $O(n\ log\ n)$

6406532733721. ✖ $O(n^2)$

Question Number : 230 Question Id : 640653816101 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

The following sequence of stack operations is performed on a Stack:

```
Push(10)
Push(20)
Pop
Push(20)
Push(10)
Pop
Push(10)
Pop
Pop
Pop
```

The sequence of values popped from the Stack is:

Options :

6406532733727. ✖ 10, 10, 20, 10, 20

6406532733728. ✔ 20, 10, 10, 20, 10

6406532733729. ✖ 20, 20, 10, 10, 10

6406532733730. ✖ 10, 20, 10, 20, 10

Question Number : 231 Question Id : 640653816102 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

A hash table of size 9 (index 0 to 8) uses open addressing with hash function `h(k) = k mod 9`, and linear probing. The following elements are added into the hash table, which was initially empty.

`18,21,90,31,45 and 55`

The key value 55 is stored at which index of the hash table?

Options :

6406532733731. ✖ 2

6406532733732. ✖ 3

6406532733733. ✖ 4

6406532733734. ✔ 5

Question Number : 232 Question Id : 640653816103 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

You are given a social network with users and their friendships represented as a graph. You want to find the shortest chain of friends between User A and User B. Which of the following algorithm is best suited and efficient for solving this problem?

Options :

6406532733735. ✔ Breadth-first search

6406532733736. ✖ Depth-first search

6406532733737. ✖ Dijkstra's Algorithm

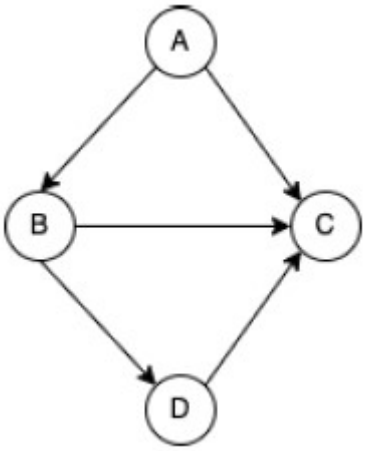
6406532733738. ✖ Bellman-Ford algorithm

Question Number : 233 Question Id : 640653816105 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the graph given below



Which of the following is the correct topological ordering of the given graph?

Options :

6406532733743. ✖ A – B – C – D

6406532733744. ✖ A – C – D – B

6406532733745. ✖ A – C – B – D

6406532733746. ✔ A – B – D – C

Question Number : 234 Question Id : 640653816106 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following code.

```
visited=[False for i in range(5)]
def fun(v,G):
    print(v,end=",")
    visited[v]=True

    for i in range(5):
        if not visited[i] and G[v][i]==1:
            fun(i,G)
```

Consider the following adjacency matrix **G**.

$$G = \begin{bmatrix} 0,0,0,1,1 \\ 0,0,0,0,1 \\ 0,0,0,1,0 \\ 1,0,1,0,0 \\ 1,1,0,0,0 \end{bmatrix}$$

What will be the output produced by `fun(0,G)`?

Options :

6406532733747. ✖ `0,2,3,1,4,`

6406532733748. ✖ `0,3,2,1,4,`

6406532733749. ✖ `0,2,3,4,1,`

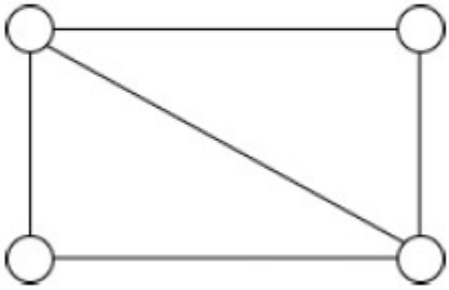
6406532733750. ✔ `0,3,2,4,1,`

Question Number : 235 Question Id : 640653816108 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

In the given graph below, How many spanning trees can be formed?



Options :

6406532733752. ✖ 4

6406532733753. ✖ 6

6406532733754. ✖ 7

6406532733755. ✔ 8

Question Number : 236 Question Id : 640653816110 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the elements **71, 65, 84, 69, 66, 81, and 62** inserted into empty binary search tree in the same sequence. Which element will be inserted in the lowest level?

Options :

6406532733757. ✖ 62

6406532733758. ✖ 69

6406532733759. ✔ 66

6406532733760. ✖ 81

Question Number : 237 Question Id : 640653816111 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

A Priority-Queue is implemented as a Max-Heap. Initially, the max-heap is `[22, 19, 18, 15, 13]`. Two new elements 31 and 24 are inserted in the given Max-Heap in that order. Max-Heap after the insertion of the elements is__ .

Options :

6406532733761. ✖ `[31, 19, 24, 15, 13, 22, 18]`

6406532733762. ✔ `[31, 19, 24, 15, 13, 18, 22]`

6406532733763. ✖ `[31, 19, 24, 18, 15, 13, 22]`

6406532733764. ✖ `[31, 19, 24, 22, 18, 15, 13]`

Question Number : 238 Question Id : 640653816112 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

What is the maximum height of a AVL tree with `12` nodes? Consider that the height of the tree with single node is 1.

Options :

6406532733765. ✖ 4

6406532733766. ✔ 5

6406532733767. ✖ 3

6406532733768. ✖ 7

Sub-Section Number : 3

Sub-Section Id : 640653118925

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 239 Question Id : 640653816100 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

```
class Node:
    def __init__(self,data):
        self.data = data
        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 and `tail` pointer that points to the last node of the linked list.

Let the linked list have `n` elements. Which of the following statement(s) is/are **true**?

Options :

6406532733722. ✔ first and last element can be directly accessed in the linked list in constant time.

6406532733723. ✔ Insertion of the new node at the end of the linked list takes constant time.

6406532733724. ✖ Insertion of the new node at the end of the linked list takes $O(n)$ time.

6406532733725. ✖ Deletion of the last node of the linked list takes $O(1)$ time.

6406532733726. ✖ If linked list is sorted, binary search takes $O(logn)$ time for search.

Question Number : 240 Question Id : 640653816104 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider an undirected unweighted graph G with following set of vertices (V) and edges (E):

$V = \{v_1, v_2, v_3, v_4, v_5, v_6, v_7\}$

$E = \{(v_1, v_2), (v_1, v_3), (v_1, v_4), (v_2, v_4), (v_2, v_5), (v_3, v_4), (v_5, v_7), (v_5, v_6), (v_2, v_7)\}$.

A Breadth First Search(BFS) on the graph G is performed with v_1 as start vertex. Which of the following is/are the tree edge(s)?

Options :

6406532733739. ✖ (v_2, v_4)

6406532733740. ✔ (v_1, v_4)

6406532733741. ✔ (v_2, v_5)

6406532733742. ✖ (v_5, v_7)

Sub-Section Number :	4
Sub-Section Id :	640653118926
Question Shuffling Allowed :	Yes
Is Section Default? :	null

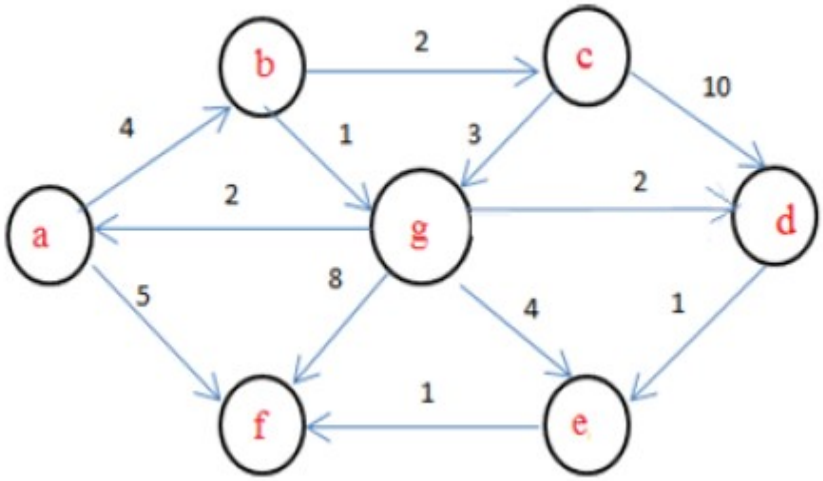
Question Number : 241 Question Id : 640653816107 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

In the given graph below, what is the minimum cost to reach vertex `f` from vertex `c`?



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Question Number : 242 Question Id : 640653816109 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 a complete binary tree **T** with **19** nodes. The number of leaf nodes in **T** is ____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 243 Question Id : 640653816113 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

An entire message is created using characters from the set S = {A, B, C, D, E}. The probability of occurrence of each character is given in the table below.

P	Q	R	S	T
0.08	0.11	0.25	0.43	0.13

How many bits will be used to encode the message `PQRST` using Huffman codes?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

14

Question Number : 244 Question Id : 640653816114 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

In a list `L` , two elements `L[i]` and `L[j]` form a inversion if `L[i] > L[j]` and `i < j` . The total number of inversions for the list `L = [3, 4, 8, 9, 7, 5, 1]` is __.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

11

Question Number : 245 Question Id : 640653816115 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 function `MoM`.

```
def MoM(L): # Median of medians
  if len(L) <= 5:
    L.sort()
    return(L[len(L)//2])
  # Construct list of block medians
  M = []
  for i in range(0,len(L),5):
    X = L[i:i+5]
    X.sort()
    M.append(X[len(X)//2])
  return(MoM(M))
```

What median value will be returned by the given `MoM` function for the following list?

```
[6,7,8,10,11,10,15,13,14,17,2,3,4,3,5]
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8

Question Number : 246 Question Id : 640653816119 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 two strings:

$S_1 = abaabaa$
$S_2 = bababba$

The length of the **longest common subsequence** for string S_1 and S_2 is __ .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 247 Question Id : 640653816120 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

Let G be a simple graph with 25 vertices. The size of the maximum independent set of graph G is 15. What is the size of the minimum vertex cover of G?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Sub-Section Number :	5
Sub-Section Id :	640653118927
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653816116 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (248 to 249)

Question Label : Comprehension

The **Longest Decreasing Subsequence** problem is defined as below.

Given a list `L` of size `n` non-negative integers, determine the Longest Decreasing Subsequence(LDS) i.e., the longest possible subsequence in which the elements of the subsequence are sorted in decreasing order.

Consider the following function `LDS` which takes list `L` as input and returns the length of the Longest Decreasing Subsequence.

```
1  def LDS(L):
2      n = len(L)
3
4      Lds = [1]*n  #initialize with all 1's
5
6      for i in range(1, n):
7          for j in range(0, i):
8              if L[i] < L[j]:
9                  Lds[i] = ____ # Check here
10
11     return max(Lds)
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 248 Question Id : 640653816117 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

In the given code, what expression should be placed at the place of `____` so that it return the correct output?

Options :

6406532733772. ✖ `max(Lds[i], Lds[j])`

6406532733773. ✔ `max(Lds[i], Lds[j]+1)`

6406532733774. ✖ `max(Lds[i], Lds[j+1]+1)`

6406532733775. ✖ `max(Lds[i], Lds[j-1]+1)`

Question Number : 249 Question Id : 640653816118 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

What is the time complexity of function `LDS()` ?

Options :

6406532733776. ✔ $O(n^2)$

6406532733777. ✖ $O(n\ log\ n)$

6406532733778. ✖ $O(log\ n)$

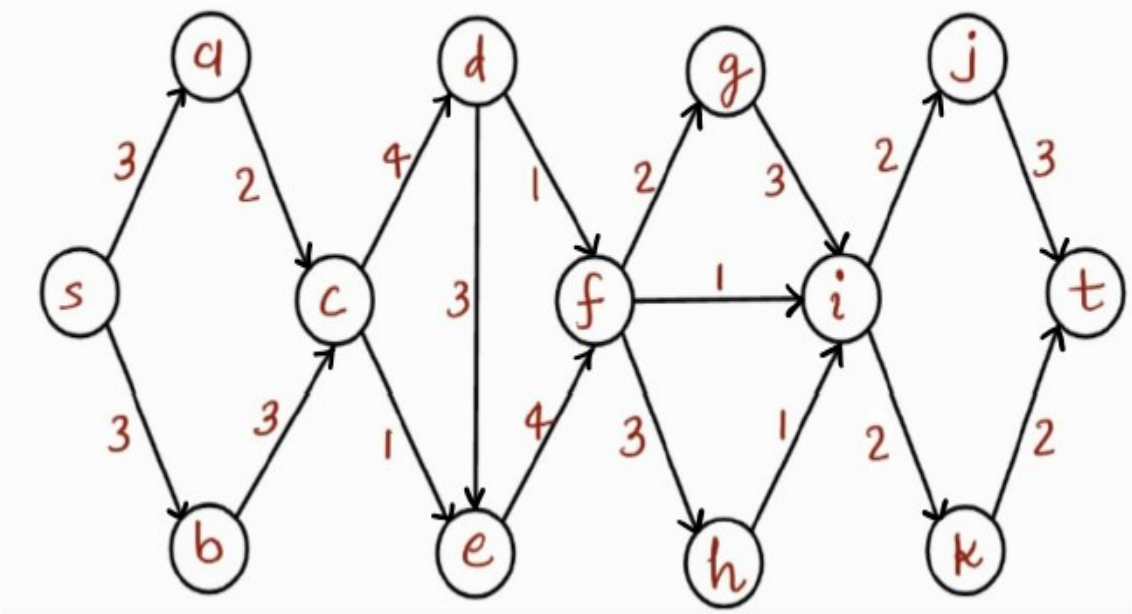
6406532733779. ✖ $O(n)$

Question Id : 640653816121 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (250 to 251)

Question Label : Comprehension

Consider the network given below with source s and sink t, with the numbers on the edges denoting maximum capacity across a particular edge.



Based on the above data, answer the given subquestions.

Sub questions

Question Number : 250 Question Id : 640653816122 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

If we increase the capacity of both edges `(i,j)` and `(i,k)` by 1, the maximum flow from s to t will increase by 1.

Options :

6406532733782. ✖ TRUE

6406532733783. ✔ FALSE

Question Number : 251 Question Id : 640653816123 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

If we Increase the capacity of both edges `(h,i)` and `(i,j)` by 1, the maximum flow from s to t will increase by 1.

Options :

6406532733784. ✔ TRUE

6406532733785. ✖ FALSE

AppDev1

Section Id :	64065356694
Section Number :	9
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	32
Number of Questions to be attempted :	32
Section Marks :	100
Display Number Panel :	Yes
Section Negative Marks :	0
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 :	640653118928
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 252 Question Id : 640653816124 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction