Question Label : Multiple Choice Question

Which of the following could be the possible output of print(results.best_score_)?

Options :

6406531512789. ✖ 1

6406531512790. ✔ -2999.79

6406531512791. ✖ 0.528

6406531512792. ✖ 0.681

PDSA

Section Id :	64065329424
Section Number :	8
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	30
Number of Questions to be attempted :	30
Section Marks :	100
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 :	64065365744
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 218 Question Id : 640653454911 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 :

6406531512904. ✔ YES

6406531512905. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065365745
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 219 Question Id : 640653454912 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 functions:

$f(n) = 2^{\log n} \log n$

$g(n) = n \log \log n$

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

Which of the following options is correct?

Options :

6406531512906. ✖ $f(n) = O(g(n))$
$g(n) = O(h(n))$

6406531512907. ✔ $f(n) = \Omega(g(n))$
$g(n) = O(h(n))$

6406531512908. ✖ $g(n) = O(f(n))$
$h(n) = O(f(n))$

6406531512909. ✖ $h(n) = O(g(n))$
$g(n) = \Omega(f(n))$

Question Number : 220 Question Id : 640653454913 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

```
1  def fun(n):
2      i = n
3      s = 1
4      while i >= 1:
5          s = s + 1
6          i = i//3
7      return s
```

Let $T(n)$ denote the time complexity for given function `fun(n)` where `n` is a positive integer. Which of the following options is correct ?

Options :

6406531512910. ✖ $T(n) = O(n)$

6406531512911. ✖ $T(n) = O(n^{1/3})$

6406531512912. ✖ $T(n) = O(n^3)$

6406531512913. ✔ $T(n) = O(\log n)$

Question Number : 221 Question Id : 640653454919 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 BFS traversal from a source node s in an unweighted, connected and undirected graph results in a BFS tree T. The tree T is a data structure for computing___

Options :

6406531512932. ✖ the shortest path between every pair of vertices.

6406531512933. ✖ the shortest path from S to only those nodes that are leaves of T.

6406531512934. ✔ the shortest path from S to every vertex in the graph.

6406531512935. ✖ the longest path from S to every vertex in the graph.

Question Number : 222 Question Id : 640653454920 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

Suppose, in a depth-first traversal of an undirected graph `G` with `15` vertices, `9` edges are marked as tree edges. The number of connected components in `G` is ___.

Options :

6406531512936. ✖ 3

6406531512937. ✖ 4

6406531512938. ✖ 5

6406531512939. ✔ 6

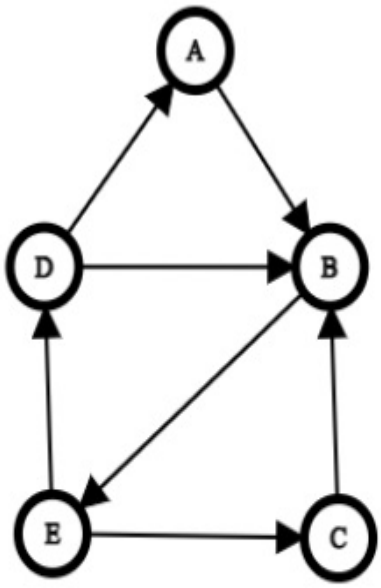
Question Number : 223 Question Id : 640653454921 Question Type : MCQ Is Question

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 directed graph G.



Suppose depth-first traversal is performed on the given graph G with the start vertex as E. Suppose the number of tree edges is E_t, the number of back edges is E_b and the number of cross edges is E_c. Which of the following options is correct?

Note:- Assume that whenever there is a choice, the vertex earlier in the alphabetical order is to be chosen.

Options :

6406531512940. ✖ $E_b = 2, E_c = 1 \; and \; E_t = 4$

6406531512941. ✖ $E_b = 2, E_c = 2 \; and \; E_t = 3$

6406531512942. ✔ $E_b = 1, E_c = 2 \; and \; E_t = 4$

6406531512943. ✖ $E_b = 1, E_c = 3 \; and \; E_t = 3$

Question Number : 224 Question Id : 640653454923 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

Which one of the following algorithm design techniques is used in Huffman Encoding algorithm ?

Options :

6406531512948. ✔ Greedy

6406531512949. ✖ Dynamic programming

6406531512950. ✖ Divide and conquer

6406531512951. ✖ None of these

Question Number : 225 Question Id : 640653454924 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

Let G = (V, E) be an undirected graph having distinct positive edge weights. Let V be partitioned into two non-empty sets X and Y. Let e = (s, t) be the minimum cost edge, with s belonging to X and t belonging to Y. Which of the following statement(s) is/are true?

1. There must be only one unique spanning tree with minimum weight for G.
2. The edge e must definitely belong to minimum cost spanning tree of G

Options :

6406531512952. ✖ Only 1

6406531512953. ✖ Only 2

6406531512954. ✔ Both 1 and 2

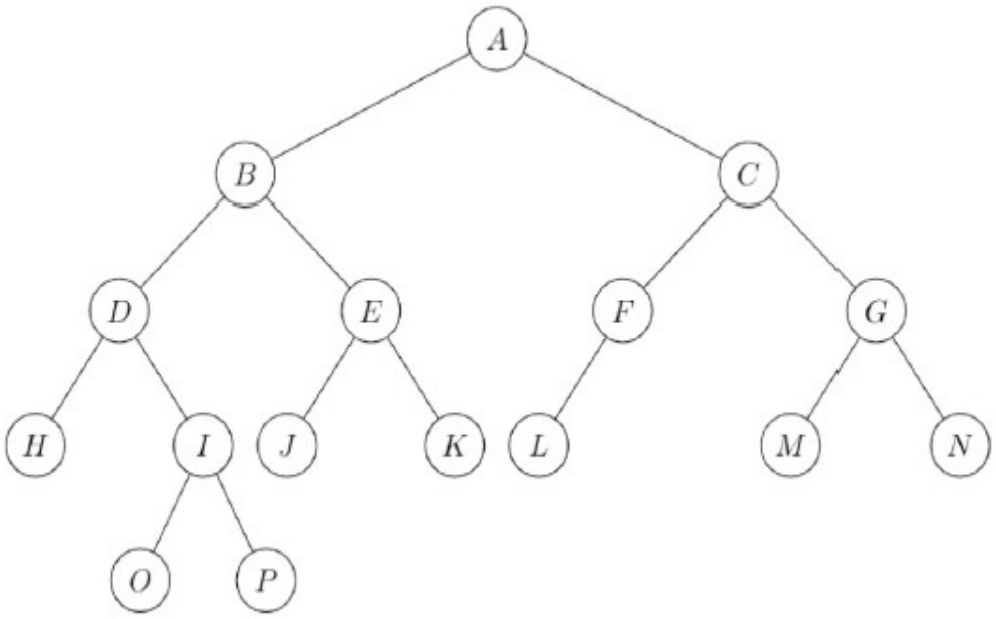
6406531512955. ✖ Neither 1 nor 2

Question Number : 226 Question Id : 640653454926 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 binary search tree. The letters indicate the names of the nodes, not the values that are stored.



Which of the following nodes is 3rd smallest node (in terms of value) in the given binary search tree?

Options :

6406531512960. ✖ B

6406531512961. ✖ I

6406531512962. ✔ O

6406531512963. ✖ P

Question Number : 227 Question Id : 640653454927 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

The maximum and the minimum number of nodes possible in a binary search tree of height **5** are___. Consider that the height of the empty tree is 0.

Options :

6406531512964. ✖ 32 and 5, respectively

6406531512965. ✖ 32 and 4, respectively

6406531512966. ✔ 31 and 5, respectively

6406531512967. ✖ 31 and 4, respectively

Question Number : 228 Question Id : 640653454939 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

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 :

6406531512996. ✖ `T = 'baabaabaabaab' and P = 'abba'`

6406531512997. ✔ `T = 'aaaaaaaaaaaaa' and P = 'baaa'`

6406531512998. ✖ `T = 'aaaaaaaaaaaaa' and P = 'abbb'`

6406531512999. ✖ `T = 'aaaaaaaaaaaaa' and P = 'bbba'`

Question Number : 229 Question Id : 640653454940 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

What can be the maximum depth of the Trie data structure with n strings and m as the maximum string length among all strings? Consider that root is at depth 1 and ignore terminal node `$` for depth.

Options :

6406531513000. ✖ $log\ n$

6406531513001. ✖ $log\ m$

6406531513002. ✖ n

6406531513003. ✔ m

Question Number : 230 Question Id : 640653454942 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

Which of the following statements are true ?

1. If a $NP-hard$ problem **A**, can be polynomial time reducible to another problem **B** then **B** is a NP class problem.
2. If a $NP-hard$ problem **A**, can be polynomial time reducible to another problem **B** then **B** is a $NP-complete$ class problem.
3. There exists polynomial time checking algorithm for all P class problems.

Options :

6406531513010. ✖ Only statement 1

6406531513011. ✖ Only statement 2

6406531513012. ✔ Only statement 3

6406531513013. ✖ Statement 2 and Statement 3

6406531513014. ✖ Statement 1 and Statement 2

Sub-Section Number :	3
Sub-Section Id :	64065365746
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 231 Question Id : 640653454914 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 list of $\log n$ sorted strings, each of length $n/\log n$, is merged together such that the lexicographic order is maintained in the final merged string. If we use the merge-sort algorithm then what is the worst case running time ?

Options :

6406531512914. ✖ $O(n)$

6406531512915. ✖ $O(n/\log n)$

6406531512916. ✖ $O(n \log n)$

6406531512917. ✔ $O(n \log \log n)$

Question Number : 232 Question Id : 640653454916 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

```
class Node:
    def __init__(self,data):
        self.data = data
        self.next = None
```

Suppose each node of the linked list is an object of class Node, `head` is the first node of the linked list and the list has the following elements:

`10, 5, 7, 20, 15, 25, 30, 14, 17`

```
def operation(head):
    ptr0 = head
    ptr1 = head
    ptr2 = head
    while (ptr2 != None and ptr2.next!= None):
        ptr0 = ptr1
        ptr1 = ptr1.next
        ptr2 = ptr2.next.next
    ptr0.next = ptr1.next
```

Which of the following element will be removed from the given linked list after calling function `operation(head)` ?

Options :

6406531512923. ✔ `15`

6406531512924. ✖ `25`

6406531512925. ✖ `20`

6406531512926. ✖ `17`

Question Number : 233 Question Id : 640653454925 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

Suppose we have a max heap `H` (implemented using list) of seven integers and we are trying to sort them using the following heapsort algorithm:

```
1  def heapsort(H):
2      n = len(H)
3      for i in range(n-1,-1,-1):
4          H[0],H[i] = H[i],H[0]
5          max_heapify(H,i,0) #convert H into max heap again
```

We have just completed some iterations of the for loop in `heapsort(H)` and the underlying list now looks like this:-

`[26, 24, 25 ,20, 22, 37, 39]`.

How many times have `max_heapify` operation been performed on root of the heap?

Options :

6406531512956. ✖ 1

6406531512957. ✔ 2

6406531512958. ✖ 3

6406531512959. ✖ 4

Question Number : 234 Question Id : 640653454935 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

An algorithm to find the length of the longest strictly increasing sequence of numbers in list $A_{0...n-1}$ is given below.

1. $n = length(A)$
2. $Initialize\ list\ L_{0...n-1} = 0$
3. $L_0 = 1$
4. $For\ all\ i,\ start\ from\ index\ 1\ to\ n-1:$
5. **Inductive structure**
6. $return\ max(L)$

Note: L_j *is the length of the longest strictly increasing sequences ending at* A_j, *where* $0 \leq j \leq n-1$

Which of the following is the correct **inductive structure** to fill at step 5 to return the correct result?

Options :

6406531512986. ✖ $$L_i = \begin{cases} 1 + L_{i+1}, & if\ \ A_i > A_{i+1} \\ 1, & Otherwise \end{cases}$$

6406531512987. ✔ $$L_i = \begin{cases} 1 + L_{i-1}, & if\ \ A_i > A_{i-1} \\ 1, & Otherwise \end{cases}$$

6406531512988. ✖ $$L_i = \begin{cases} 1 + L_{i-1}, & if\ \ A_i < A_{i-1} \\ 1, & Otherwise \end{cases}$$

6406531512989. ✖ $$L_i = \begin{cases} 1 + L_{i-1}, & if\ \ A_i >= A_{i-1} \\ 1, & Otherwise \end{cases}$$

Question Number : 235 Question Id : 640653454938 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

Which of the following options represents the fail function (or prefix function) for pattern **'ABABAABA'** in the Knuth-Morris-Pratt (KMP) algorithm?

Options :

6406531512992. ✖ `[0, 1, 1, 2, 0, 1, 2, 3]`

6406531512993. ✖ `[0, 0, 1, 2, 3, 0, 1, 2]`

6406531512994. ✖ `[0, 1, 1, 2, 3, 1, 2, 3]`

6406531512995. ✔ `[0, 0, 1, 2, 3, 1, 2, 3]`

Sub-Section Number : 4

Sub-Section Id : 64065365747

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 236 Question Id : 640653454915 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

Suppose we are sorting a list of eight integers using quicksort, and we have just finished the first partitioning and the list looks like this:

`[36, 44, 71, 12, 55, 101, 112, 183]`

Suppose the first element in the list is selected as the pivot for partitioning each time. Which of the following could have been the pivot for the first partitioning?

Options :

6406531512918. ✖ 44

6406531512919. ✖ 12

6406531512920. ✖ 55

6406531512921. ✔ 101

6406531512922. ✔ 112

Question Number : 237 Question Id : 640653454918 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 statements is/are true about adjacency list representation and adjacency matrix representation of a graph?

Options :

6406531512928. ✔ Adjacency list representation uses less space when the graph is sparse(graph with few edges).

6406531512929. ✖ DFS and BFS can be done in O(V+E) time using adjacency matrix. Here V and E are number of vertices and edges respectively.

6406531512930. ✔ Finding `outdegree` of a vertex using adjacency list is faster than using adjacency matrix.

6406531512931. ✖ Finding `indegree` of a vertex using adjacency list is faster than using adjacency matrix.

Question Number : 238 Question Id : 640653454922 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 statements is **true** about Dijkstra's algorithm to find the shortest path?

Options :

6406531512944. ✖ The shortest path returned by Dijkstra's algorithm always passes through the least number of vertices.

6406531512945. ✔ To decide which node to visit next, Dijkstra's algorithm selects the node with smallest known distance.

6406531512946. ✔ Dijkstra’s algorithm may fail for graphs with negative weights because it does not reconsider a node once it marks it as visited even if a shorter path exists than the previous one.

6406531512947. ✖ It returns the shortest path between all pairs of nodes.

Question Number : 239 Question Id : 640653454929 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 **true** about AVL Tree? Assume that the height of the empty tree is 0.

Options :

6406531512969. ✔ Let `s(h)` denote the minimum number of nodes in an AVL tree of height `h` then:- `s(h) = s(h-1) + s(h-2) + 1`, where `s(0) = 0` and `s(1) = 1`.

6406531512970. ✔ 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.

6406531512971. ✖ If the height of an AVL tree is `h`, the maximum number of nodes in it will be $2^h + 1$.

6406531512972. ✖ The complexity of both insertion and deletion of a node in AVL tree is $O(n)$.

Question Number : 240 Question Id : 640653454930 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 statements is/are **true** about Huffman coding algorithm?

Options :

6406531512973. ✔ In an optimal Huffman tree, if leaf labelled **x** is at depth smaller than leaf labelled **y**, then **frequency(x) >= frequency(y)**

6406531512974. ✖ In an optimal Huffman tree, if leaf labelled **x** is at depth smaller than leaf labelled **y**, then **frequency(x) <= frequency(y)**

6406531512975. ✔ Huffman coding algorithm always generates prefix code.

6406531512976. ✔ Huffman coding algorithm is based on a greedy approach.

Sub-Section Number :	5
Sub-Section Id :	64065365748
Question Shuffling Allowed :	Yes

Is Section Default? : null

Question Number : 241 Question Id : 640653454917 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

A hash table of size 15 (with index 0 to 14) using open addressing with linear probing and hash function is `h(k)= (k) mod 15` , where k is the key value. Initially, the table is empty . Following keys are inserted into table in given order .

36, 23, 72, 12, 45

If we insert a new key value `42` after inserting the above elements then at which index of the hash table will it get inserted ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

14

Question Number : 242 Question Id : 640653454928 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 tasks T1, T2, .. T9.

Task	T1	T2	T3	T4	T5	T6	T7	T8	T9
Profit	25	30	50	28	28	20	33	26	35
Deadline	7	2	5	3	4	5	2	7	3

The execution of each task requires one unit of time. We can execute one task at a time. Each task T_i has profit P_i and a deadline D_i. Profit P_i is earned if completion time of Ti <= deadline Di.

What is the maximum profit that can be made considering the above data ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

227

Question Number : 243 Question Id : 640653454936 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:-

`S1 = "pqrqspq"`

`S2 = "qsrpqp"`

Let `a` be the length of the longest common subsequence between `S1` and `S2` and let `b` be the number of such unique longest common subsequences between `S1` and `S2`. Then `5a + b =___`

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

23

Question Number : 244 Question Id : 640653454937 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 four matrices M_1, M_2, M_3 and M_4 of dimensions 10 x 100, 100 x 20, 20 x 5, and 5 x 80 respectively. The minimum number of scalar multiplications required to find the product $M_1 \times M_2 \times M_3 \times M_4$ using the basic matrix multiplication method is __

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

19000

Sub-Section Number :	6
Sub-Section Id :	64065365749
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 245 Question Id : 640653454931 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Let `L` be an integer list of length `n`. The number of **inversions** is the number of the different pairs `(i, j)` where:

- `0 <= i < j < n`
- `L[i] > L[j]`

The total number of inversions for `L = [12, 7, 4, 15, 2, 20]` is ___.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Sub-Section Number :	7
Sub-Section Id :	64065365750
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 246 Question Id : 640653454941 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Selectable Option : 0

Question Label : Multiple Select Question

A manufacturing company produces two types of products: `A` and `B`. Market tests and available resources indicate that the combined production level should not exceed 1200 products per week and the demand for the product `B` is at most half of that for product `A`. Further, the production level of product `A` can exceed three times the production of product `B` by at most 600 units. The company makes profit of Rs 12 and Rs 16 per product respectively on product `A` and B .

The above problem is to be formulated as a linear programming problem. Let x and y be the number of product `A` and product `B`, respectively. Objective function to maximize the number of products `z = 12x + 16y`.

Which of the following are **valid** constraints for the given problem?

Options :

6406531513004. ✔ x + y <= 1200

6406531513005. ✖ 2x - y >= 0

6406531513006. ✖ 3x - y <= 600

6406531513007. ✔ x - 2y >=0

6406531513008. ✔ x - 3y <= 600

6406531513009. ✔ x, y >= 0

Sub-Section Number :	8
Sub-Section Id :	64065365751
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653454932 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 : (247 to 248)

Question Label : Comprehension

Let `A` be a non empty list of `n` integers. The function `findMaxMin(start_index, last_index, A)` returns maximum `maxA` and minimum `minA` in list A.

```
def findMaxMin(start_index, last_index, A):
 # initially start_index = 0, last_index = n-1
  if (start_index == last_index):
    maxA = minA = A[start_index]
  elif (start_index == last_index - 1):
    if (A[start_index] < A[last_index]):
      maxA, minA = A[last_index], A[start_index]
    else:
      maxA, minA = A[start_index], A[last_index]
  else:
    mid = (start_index + last_index) // 2
    maxL, minL = findMaxMin(start_index, mid, A)
    maxR, minR = findMaxMin(mid + 1, last_index, A)
    maxA = max(maxL, maxR)
    minA = min(minL, minR)
  return maxA, minA
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 247 Question Id : 640653454933 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

This function `findMaxMin` is an example of___

Options :

6406531512978. ✖ A greedy algorithm

6406531512979. ✖ A dynamic programming algorithm

6406531512980. ✔ A divide and conquer algorithm

6406531512981. ✖ None of these

Question Number : 248 Question Id : 640653454934 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

Let $T(n)$ denote the worst case running time for function `findMaxMin`. Which of the following is a valid recurrence for $T(n)$?

Options :

6406531512982. ✔ $T(1) = T(2) = 1$
$For\ n > 2, T(n) = 2T(n/2) + O(1)$

6406531512983. ✖ $T(1) = T(2) = 1$
$For\ n > 2, T(n) = 2T(n/2) + O(n)$

6406531512984. ✖ $T(1) = T(2) = 1$
$For\ n > 2, T(n) = T(n/2) + O(1)$

6406531512985. ✖ $T(1) = T(2) = 1$
$For\ n > 2, T(n) = T(n/2) + O(n)$

DBMS

Section Id :	64065329425
Section Number :	9
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	50
Display Number Panel :	Yes