

Indian Institute of Technology, Madras - BS in Data Science and Applications

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 DIPLOMA AN EXAM QDD3 24 Mar
2024

Subject Name :

2024 Mar24: IIT M AN EXAM QDD3

Creation Date :

2024-03-14 14:44:47

Duration :

180

Total Marks :

765

Display Marks:

Yes

Share Answer Key With Delivery Engine :

Yes

Actual Answer Key :

Yes

Calculator :

Scientific

Magnifying Glass Required? :

No

Ruler Required? :

No

Eraser Required? :

No

Scratch Pad Required? :

No

Rough Sketch/Notepad Required? :

No

Protractor Required? :

No

Show Watermark on Console? :

Yes

Highlighter :

No

Auto Save on Console?

Yes

Change Font Color :

No

Change Background Color :

No

Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No

Group I

Group Number :	1
Group Id :	64065317433
Group Maximum Duration :	0
Group Minimum Duration :	90
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	765
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No
Revisit allowed for group Instructions? :	Yes
Maximum Instruction Time :	0
Minimum Instruction Time :	0
Group Time In :	Minutes
Navigate To Group Summary From Last Question? :	No
Disable Submit Button During Assessment? :	No
Section Selection Time? :	0
No of Optional sections to be attempted :	0

Section Id :	64065353272
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
Section Marks :	50
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 :	640653112661
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 1 Question Id : 640653770687 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 "FOUNDATION LEVEL : COMPUTATIONAL THINKING (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 :

6406532577927. ✓ YES

6406532577928. ✗ NO

Sub-Section Number : 2**Sub-Section Id :** 640653112662**Question Shuffling Allowed :** No**Is Section Default? :** null**Question Number : 2 Question Id : 640653770688 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

Scores

SeqNo	Name	Gender	DateOfBirth	TownCity	Mathematics	Physics	Chemistry	Total
0	Bhuvanesh	M	7 Nov	Erode	68	64	78	210
■ ■ ■								
29	Naveen	M	13 Oct	Vellore	72	66	81	219

Words

SeqNo	Word	PartOfSpeech	LetterCount
0	It	Pronoun	2
■ ■ ■			
64	cane.	Noun	4

Library

SeqNo	Name	Author	Genre	Language	Pages	Publisher	Year
0	Igniting Minds	Kalam	Nonfiction	English	178	Penguin	2002
■ ■ ■							
29	Malgudi Days	Narayan	Fiction	English	150	Indian Thought	1943

Olympics

SeqNo	Name	Gender	Nationality	Host country	Year	Sport	Medal
0	Karnam Malleswari	F	Indian	Australia	2000	Weightlifting	Bronze
- - -							
49	Michael Phelps	M	American	China	2008	Swimming	Gold

Three sample cards out of 30 for Shopping Bills dataset

Item List

SV Stores		Srivatsan		1
Item	Category	Qty	Price	Cost
Carrots	Vegetables/Food	1.5	50	75
Soap	Toiletries	4	32	128
Tomatoes	Vegetables/Food	2	40	80
Bananas	Vegetables/Food	8	8	64
Socks	Footwear/Apparel	3	56	168
Curd	Dairy/Food	0.5	32	16
Milk	Dairy/Food	1.5	24	36
				567

Sun General		Vignesh		14
Item	Category	Qty	Price	Cost
Phone Charger	Utilities	1	230	230
Razor Blades	Grooming	1	12	12
Razor	Grooming	1	45	45
Shaving Lotion	Grooming	0.8	180	144
Earphones	Electronics	1	210	210
Pencils	Stationery	3	5	15
				656

Big Bazaar		Sudeep		2
Item	Category	Qty	Price	Cost
Baked Beans	Canned/Food	1	125	125
Chicken Wings	Meat/Food	0.5	600	300
Cocoa powder	Canned/Food	1	160	160
Capsicum	Vegetables/Food	0.8	180	144
Tie	Apparel	2	390	780
Clips	Household	0.5	32	16
				1525

Options :

6406532577929. ✓ Useful Data has been mentioned above.

6406532577930. ✗ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 3

Sub-Section Id : 640653112663

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 3 Question Id : 640653770689 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 will the value of **mList** be at the end of the execution of below pseudocode?

```
1 L = [[10, 'apple', 5.0], [20, 'banana', 3.5], [30, 'cherry', 2.0], [40,
  'date', 1.5], [50, 'elderberry', 4.0]]
2 mList = []
3 foreach element in L{
4     z = DoSomething(element)
5     mList = mList ++ [z]
6 }
7
8 Procedure DoSomething(x)
9     a = rest(x)
10    return(first(a))
11 End DoSomething
```

Options :

6406532577931. ✖ [10,20,30,40,50]

6406532577932. ✖ [10, 'apple', 5.0, 20, 'banana', 3.5, 30, 'cherry', 2.0, 40, 'date', 1.5, 50, 'elderberry', 4.0]

6406532577933. ✓ ['apple', 'banana', 'cherry', 'date', 'elderberry']

6406532577934. ✖ [5.0, 3.5, 2.0, 1.5, 4.0]

Question Number : 4 Question Id : 640653770691 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 pseudocode. What will the value of **B** be at the end of the execution?

```
1 A = [3, 8, 15, 6, 10, 5]
2 B = []
3 foreach number in A{
4     if(checkCondition(number)){
5         B = B ++ [number]
6     }
7 }
8 Procedure checkCondition(x)
9     if(x == 1){
10         return(False)
11     }
12     j = 2
13     flag = True
14     while(j < x){
15         if(remainder(x, j) == 0){
16             flag = False
17         }
18         j = j + 1
19     }
20     return(flag)
21 End checkCondition
```

Options :

6406532577939. ✘ B = [3, 15, 5]

6406532577940. ✘ B = [3]

6406532577941. ✘ B = [5]

6406532577942. ✓ B = [3, 5]

Question Number : 5 Question Id : 640653770693 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 following pseudocode is executed on the "Words" table. Assume that the rows in Table 1 are sorted in increasing order of sequence number. What does the list L contain at the end of execution?

```
1 L = []
2 A = "None"
3 Read the first row X in Table 1
4 A = X.Partofspeech
5 Move X to Table 2
6 while(Table 1 has more rows){
7     Read the first row X in Table 1
8     if(X.Partofspeech == "Noun"){
9         if(A == "Article"){
10            L = L ++ [X.Word]
11        }
12    }
13    A = X.Partofspeech
14    Move X to Table 2
15 }
```

Options :

6406532577947. ✓ The list of nouns that come immediately after an article

6406532577948. ✗ The list of articles that come immediately after a noun

6406532577949. ✗ The list of nouns that come immediately before an article

6406532577950. ✗ The list of articles that come immediately before a noun

Question Number : 6 Question Id : 640653770694 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 given pseudocode is executed using "Words" dataset. What does **wordCount** represent at the end of execution?

```
1 wordCount = 0
2 while(Table 1 has more rows){
3     Read the first row X in Table 1
4     if(dosomething(X) >= 3){
5         wordCount = wordCount + 1
6     }
7     Move X to Table 2
8 }
9
10 Procedure dosomething(Y)
11     A = {}, i = 1
12     while(i <= Y.LetterCount){
13         l = ith letter of Y.word
14         if(l is consonant){
15             A[l] = True
16         }
17         i = i + 1
18     }
19     return(length(keys(A)))
20 End dosomething
```

Options :

6406532577951. ❌ Number of words in which the number of distinct consonants is greater than or equal to 3 in a particular sentence.

6406532577952. ✓ Number of words in which the number of distinct consonants is greater than or equal to 3

6406532577953. ❌ Number of words in which the number of distinct consonants is less than 3

6406532577954. ❌ Number of consonants in a word

Question Number : 7 Question Id : 640653770695 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 will the value of **B** be at the end of the execution of the following pseudocode?

```
1 Procedure dosomething(aList)
2     bDict = {}
3     bList = []
4     foreach a in aList{
5         if(not isKey(bDict, a)){
6             bDict[a] = True
7             bList = bList ++ [a]
8         }
9     }
10    return(bList)
11 End dosomething
12
13 A = [4, 3, 1, 3, 4, 5, 1, 2, 7]
14 B = dosomething(A)
```

Options :

6406532577955. ❌ [4, 3, 1, 3, 4, 5, 1, 2, 7]

6406532577956. ✓ [4, 3, 1, 5, 2, 7]

6406532577957. ❌ [5, 2, 7]

6406532577958. ❌ [1, 2, 3, 4, 5, 7]

Question Number : 8 Question Id : 640653770698 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 following pseudocode is executed using the "Scores" dataset. What will the values of **A** and **B** represent at the end of the execution?

```
1 D = []
2 while(Table 1 has more rows){
3     Read the first row X in Table 1
4     if(isKey(D, X.Town/city)){
5         if(D[X.Town/city] > X.Physics){
6             D[X.Town/city] = X.Physics
7         }
8     }
9     else{
10        D[X.Town/city] = X.Physics
11    }
12    Move X to Table 2
13 }
14
15 A = 0, B = 100
16 foreach Y in keys(D){
17     if(B == D[Y]){
18         A = A + 1
19     }
20     if(B > D[Y]){
21         A = 1
22         B = D[Y]
23     }
24 }
```

Options :

A = Number of cities where students score the lowest marks in Physics

6406532577967. ✓ **B** = The lowest marks in Physics

A = Number of cities where students score the highest marks in Physics

6406532577968. ✗ **B** = The lowest marks in Physics

A = Cities where students score the highest marks in Physics

6406532577969. ✗ **B** = The highest marks in Physics

A = Number of cities where students score the lowest marks in Physics

6406532577970. ✗ **B** = The highest marks in Physics

Sub-Section Number :	4
Sub-Section Id :	640653112664
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 9 Question Id : 640653770690 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 pseudocode is executed using the "Words" dataset and **explode(X)** returns the letters in the word X as a list. For example **explode("mood")** returns ['m', 'o', 'o', 'd']. What will **count** represent at the end of the execution?

```

1 count = 0, letterList = []
2 while(Table 1 has more rows){
3     Read the first row x in Table 1
4     letterList = explode(x.word)
5     count = count + processLetters(letterList)
6     Move x to Table 2
7 }
8
9 Procedure processLetters(L)
10    prevLetter = first(L)
11    restList = rest(L)
12    foreach letter in restList{
13        if(letter == prevLetter){
14            return(0)
15        }
16        prevLetter = letter
17    }
18    return(1)
19 End processLetters

```

Options :

6406532577935. ✘ Number of words with at most two consecutive identical letters

6406532577936. ✘ Number of words with at least two consecutive identical letters

6406532577937. ✘ Number of words with consecutive identical letters

Question Number : 10 Question Id : 640653770692 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 pseudocode is executed using the "Words" dataset. Let `X.Word` and `Y.Word` be "computational" and "thinking" respectively. At the end of the execution of the pseudocode shown below, what will be the value of `commonDict`?

```

1
2 firstDict = {}, secondDict = {}, commonDict = {}
3 firstDict = updateDict(X, commonDict)
4 secondDict = updateDict(Y, commonDict)
5 foreach key in keys(firstDict){
6     if(isKey(secondDict, key)){
7         if(firstDict[key] > secondDict[key]){
8             commonDict[key] = firstDict[key]
9         }
10    else{
11        commonDict[key] = secondDict[key]
12    }
13}
14}
15
16 Procedure updateDict(Z, Dict)
17     i = 1, x = ''
18     while(i <= Z.LetterCount){
19         x = ith letter of Z.Word
20         if(not isKey(Dict, x)){
21             Dict[x] = 1
22         }
23         else{
24             Dict[x] = Dict[x] + 1
25         }
26         i = i + 1
27     }
28     return(Dict)
29 End updateDict

```

Options :

6406532577943. ✖ {t:1, i: 1, n:1}

6406532577944. ✓ {t':2, 'i': 2, 'n':2}

6406532577945. ✗ {t':2, 'i': 1, 'n':1}

6406532577946. ✗ {t':1, 'i': 2, 'n':2}

Question Number : 11 Question Id : 640653770696 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 pseudocode is executed using the "Olympics" dataset. What will **B** represent at the end of execution?

```
1 P = []
2 while(Table 1 has more rows){
3     Read the first row X in Table 1
4     P = UpdateMedalCounts(P, X.Sport, X.Medal)
5     Move X to Table 2
6 }
7 B = dosomething(P)
8
9 Procedure UpdateMedalCounts(Q, Sport, Medal)
10    if(isKey(Q, Sport)){
11        Q[Sport][Medal] = Q[Sport][Medal] + 1
12    }
13    else{
14        Q[Sport] = {"Gold":0, "silver":0, "Bronze":0}
15        Q[Sport][Medal] = 1
16    }
17    return (Q)
18 End UpdateMedalCounts
19
20 Procedure dosomething(R)
21    max = 0
22    for each sport in keys(R) {
23        if(R[sport]["Gold"] > max){
24            max = R[sport]["Gold"]
25        }
26    }
27    return (max)
28 End dosomething
```

Options :

6406532577959. ❌ Minimum number of gold medals among all the sports

6406532577960. ✓ Maximum number of gold medals among all the sports

6406532577961. ❌ Maximum number of medals among all the sports

6406532577962. ❌ Total number of gold medals in all the sports

Question Number : 12 Question Id : 640653770697 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 pseudocode is executed using the "Shopping bills" dataset. What will AA represent at the end of execution?

```
1 BB = {}, AA = "None"
2 while(Pile 1 has more cards){
3     Read the top card X in Pile 1
4     if(X.ShopName == "SV Stores"){
5         BB = UpdateDictionary(BB, X)
6     }
7     Move X to Pile 2
8 }
9 AA = GetKeyByKey(BB)
10
11 Procedure UpdateDictionary(D, Y)
12     foreach A in Y.ItemList{
13         if(isKey(D, A.Category)){
14             D[A.Category] = D[A.category] + 1
15         }
16         else{
17             D[A.Category] = 1
18         }
19     }
20     return(D)
21 End UpdateDictionary
22
23 Procedure GetKeyByKey(D)
24     A = "None", B = 0
25     foreach Y in keys(D){
26         if(B < D[Y]){
27             A = Y
28             B = D[Y]
29         }
30     }
31     return(A)
32 End GetKeyByKey
```

Options :

6406532577963. ✘ Finds the least frequent item category from SV Stores

6406532577964. ✘ Finds the list of item categories from SV Stores

6406532577965. ✓ Finds the most frequent item category from SV Stores

6406532577966. ✘ Finds the number of items from SV Stores

Question Number : 13 Question Id : 640653770699 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 pseudocode is executed using the "station wise" cards of the "Train" dataset. At the end of the execution, **STN** should capture the following information: for a station **X**, and a day of a week **A**, **STN[X][A]** should store the number of trains running through **X** on day **A**. Choose the correct code fragment to complete the pseudocode. [Note: Assume that for each station, the train list is given in a single card.]

```
1 STN = []
2 while(Pile 1 has more cards){
3     Read the top card X in Pile 1
4     STN[X.StationName] = getInfo(STN, X)
5     Move X to Pile 2
6 }
7
8 Procedure getInfo(STN, x)
9     ****
10    * Fill the code *
11    ****
12    return(D)
13 End getInfo
```

Options :

```
1 D = {}
2 foreach A in x.TrainList{
3     foreach B in A.Days{
4         D[B] = 1
5     }
6 }
```

6406532577971. *

```
1 D = {"M": 0, "Tu": 0, "W": 0, "Th": 0, "F": 0, "Sa": 0, "Su": 0}
2 foreach A in x.TrainList{
3     foreach B in A.Days{
4         D[B] = 1
5     }
6 }
```

6406532577972. *

```
1 | D = []
2 | foreach A in X.TrainList{
3 |     foreach B in A.Days{
4 |         D[B] = D[B] + 1
5 |     }
6 | }
```

6406532577973. ✘

```
1 | D = {"M": 0, "Tu": 0, "W": 0, "Th": 0, "F": 0, "Sa": 0, "Su": 0}
2 | foreach A in X.TrainList{
3 |     foreach B in A.Days{
4 |         D[B] = D[B] + 1
5 |     }
6 | }
```

6406532577974. ✓

Question Number : 14 Question Id : 640653770700 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 pseudocode is executed using the "Words" dataset. What will **count** represent at the end of execution?

```
1 count = 0
2 L = []
3 while(Table 1 has more rows){
4     Read the first row X in Table 1
5     L = addSomething(L, X)
6     if(X.Word ends with a full stop){
7         if(length(L) >= 10){
8             count = count + 1
9         }
10        L = []
11    }
12    Move X to Table 2
13 }
14
15 Procedure addSomething(M, Y)
16     i = 1
17     while(i <= Y.LetterCount){
18         p = ith letter of Y.Word
19         if(not (member(M, p))){
20             M = M ++ [p]
21         }
22         i = i + 1
23     }
24     return(M)
25 End addSomething
```

Options :

6406532577975. ❌ Number of sentences having at least 10 words

6406532577976. ❌ Number of words having at least 10 distinct letters

6406532577977. ❌ Number of sentences having at least 10 letters

6406532577978. ✓ Number of sentences having at least 10 distinct letters

Sub-Section Number : 5

Sub-Section Id : 640653112665

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 15 Question Id : 640653770701 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

We have a non-empty list, **Publisher** that stores the publisher name in each card from the "Library" dataset, sorted in alphabetical order. This results in many duplicates. The following procedure attempts to extract the unique list of publishers, while preserving the sorted order. The pseudocode may have mistakes. Identify all such mistakes (if any). It is a Multiple Select Question.

```
1 uniqueList = [first(Publisher)]
2 prev = last(Publisher)
3 for each x in rest(Publisher){
4     if(x != prev){
5         uniqueList = uniqueList ++ x
6     }
7     prev = x
8 }
```

Options :

6406532577979. ✓ Error in line 3

6406532577980. ✗ Error in line 4

6406532577981. ✗ Error in line 5

6406532577982. ✓ Error in line 6

6406532577983. ✗ Error in line 8

6406532577984. ✗ The pseudocode is error free

Question Number : 16 Question Id : 640653770702 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

The following pseudocode is executed using the "Library" dataset. Let **p** be a list of authors, and after the execution of pseudocode below, **dict[X]** stores the number of books having at least 200 pages and written on or after 2000 by author X. Choose the correct code fragment(s) to complete the pseudocode.

It is a Multiple Select Question (MSQ).

```
1 dict = { }
2 foreach author in p{
3     dict[author] = 0
4 }
5 while(Table 1 has more rows){
6     Read the first row X from Table 1
7     *****
8     *      Fill the Code      *
9     *****
10    Move X to Table 2
11 }
```

Options :

```
1 if(isKey(dict, x.Author) and (x.Pages >= 200 and x.Year >= 2000)){
2     dict[author] = dict[author] + 1
3 }
```

6406532577985. ✓

```
1 if(isKey(dict, x.Author) or (x.Pages >= 200 and x.Year >= 2000)){
2     dict[author] = dict[author] + 1
3 }
```

6406532577986. ✗

```
1 C = False, D = False
2 if(isKey(dict, x.Author) and (x.Pages >= 200)){
3     C = True
4 }
5 if(isKey(dict, x.Author) and (x.Year >= 2000)){
6     D = True
7 }
8 if(C and D){
9     dict[author] = dict[author] + 1
10 }
```

6406532577987. ✓

6406532577988. ✗

```

1 C = False, D = False
2 if(isKey(dict, x.Author) and (x.Pages >= 200)){
3     C = True
4 }
5 if(isKey(dict, x.Author) and (x.Year >= 2000)){
6     D = True
7 }
8 if(C or D){
9     dict[author] = dict[author] + 1
10}

```

Maths 1

Section Id :	64065353273
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
Section Marks :	50
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 :	640653112666
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 17 Question Id : 640653770703 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 "FOUNDATION LEVEL : MATHEMATICS FOR DATA SCIENCE I (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 :

6406532577989. ✓ YES

6406532577990. ✗ NO

Question Number : 18 Question Id : 640653770704 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

Instructions:

- There are some questions which have functions with discrete valued domains (such as day, month, year etc). For simplicity, we treat them as continuous functions.
- For NAT type question, enter only one right answer even if you get multiple answers for that particular question.

Options :

6406532577991. ✓ Instructions has been mentioned above.

6406532577992. ✗ This Instructions is just for a reference & not for an evaluation.

Sub-Section Number :	2
Sub-Section Id :	640653112667
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 19 Question Id : 640653770710 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

Choose the correct option(s) from the following:

Options :

6406532578009. ✓ If g is an even function, then $f \circ g$ is always an even function

6406532578010. ✗ If f is an invertible increasing function, then f^{-1} is a decreasing function.

6406532578011. ✓ The function $f: \mathbb{N} \rightarrow \mathbb{N}$ given by $f(0) = f(1) = f(2) = 1$ and $f(x) = x - 1$ for $x \geq 3$ is onto but not one-one.

6406532578012. ✗ There exists a function g which is not one-one and a function f which is one-one such that $f \circ g$ is one-one.

Question Number : 20 Question Id : 640653770723 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

Choose the set of correct options.

Options :

If a function is continuous at a particular point, then the function is differentiable at that point.
6406532578022. ✘

If a function is differentiable at a particular point, then the function must be continuous at that point.
6406532578023. ✓

If $f(x)$ is differentiable at the point a , then $cf(x)$ is differentiable at the point a , for all $c \in \mathbf{R}$, and $(cf)'(a) = cf'(a)$
6406532578024. ✓

If $f(x)$ and $g(x)$ are differentiable functions, then $|(f + g)(x)|$ is also a differentiable function.
6406532578025. ✘

Sub-Section Number : 3

Sub-Section Id : 640653112668

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 21 Question Id : 640653770722 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

If $f(x) = \sqrt{9 - x^2}$, then find out the value of $8\sqrt{8} \times \lim_{x \rightarrow 1} \frac{f(x) - f(1)}{x - 1}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 22 Question Id : 640653770724 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

Consider the function $f(x) = \frac{2x^2}{|x|}$. Then $\lim_{x \rightarrow 0} f(x)$ is

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Sub-Section Number : 4

Sub-Section Id : 640653112669

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 23 Question Id : 640653770717 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 function

$$f(x) = \begin{cases} \frac{3x}{(x+2)^2} & x \leq -1 \\ 2x-5 & -1 < x \leq 1 \\ \frac{-8}{x+1} & x > 1. \end{cases}$$

Find the total number of points in $(-2, 2)$ at which $f(x)$ is not continuous.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 24 Question Id : 640653770718 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 f be a differentiable function such that $f'(4) = 1$ and $f(4) = -3$. If $y = ax + b$ denotes the tangent of the function f at $x = 4$ then find the value of b .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-7

Sub-Section Number : 5

Sub-Section Id : 640653112670

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770711 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 : (25 to 26)

Question Label : Comprehension

Answer the given subquestions.

Sub questions

Question Number : 25 Question Id : 640653770712 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

Find the number of solution(s) of the equation $9^x + 3^x - 6 = 0$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 26 Question Id : 640653770713 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

Find the number solution(s) of the equation $\ln(7) + \ln(2 - 4x^2) = \ln(14)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Id : 640653770714 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 : (27 to 28)

Question Label : Comprehension

$$\text{Let } f(x) = \begin{cases} -|x^2 - 1| & x < a \\ \sqrt{x+2} & x \geq a \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 27 Question Id : 640653770715 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

Find the smallest value of a such that the function f is defined for all real numbers.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-2

Question Number : 28 Question Id : 640653770716 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

Find the largest value of a such that the function f is defined for all real numbers and satisfies the horizontal line test.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :**-1**

Sub-Section Number :	6
Sub-Section Id :	640653112671
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770705 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 : (29 to 32)

Question Label : Comprehension

Let $f(x) = \sqrt{x}$ and $g(x) = \sqrt{3 - x}$.

	Composition of functions		Function		Domain
i)	$f \circ g$	a)	$\sqrt{3 - \sqrt{x}}$	1)	$[0, \infty)$
ii)	$g \circ f$	b)	$\sqrt[4]{x}$	2)	$[-6, 3]$
iii)	$f \circ f$	c)	$\sqrt{3 - \sqrt{3 - x}}$	3)	$(-\infty, 3]$
iv)	$g \circ g$	d)	$\sqrt[4]{3 - x}$	4)	$[0, 9]$

Table: M1T1

From the above table, answer the given subquestions.

Sub questions

Question Number : 29 Question Id : 640653770706 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

Choose the correct option from the following:

Options :

6406532577993. ✘ $i) - b) - 3)$

6406532577994. ✘ $i) - c) - 1)$

6406532577995. ✘ $i) - d) - 2)$

6406532577996. ✓ $i) - d) - 3)$

Question Number : 30 Question Id : 640653770707 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

Choose the correct option from the following:

Options :

6406532577997. ✓ $ii) - a) - 4)$

6406532577998. ✘ $ii) - b) - 3)$

6406532577999. ✘ $ii) - c) - 2)$

6406532578000. ✘ $ii) - a) - 3)$

Question Number : 31 Question Id : 640653770708 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

Choose the correct option from the following:

Options :

6406532578001. ❌ *iii) – b) – 3)*

6406532578002. ✓ *iii) – b) – 1)*

6406532578003. ❌ *iii) – d) – 3)*

6406532578004. ❌ *iii) – c) – 2)*

Question Number : 32 Question Id : 640653770709 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

Choose the correct option from the following:

Options :

6406532578005. ❌ *iv) – c) – 3)*

6406532578006. ❌ *iv) – a) – 1)*

6406532578007. ✓ *iv) – c) – 2)*

6406532578008. $\times iv) - b) - 2)$

Question Id : 640653770719 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 : (33 to 34)

Question Label : Comprehension

Find the limits of the given sequences in the subquestions.

Sub questions

Question Number : 33 Question Id : 640653770720 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

$$\{a_n\} \text{ such that } a_n = \frac{100n^2 - 11}{100n^3 + 7}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 34 Question Id : 640653770721 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

Evaluate the following limit:

$$\lim_{x \rightarrow 2} \frac{x^6 - 24x - 16}{x^3 + 2x - 12}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

12

Statistics1

Section Id : 64065353274

Section Number : 3

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 11

Number of Questions to be attempted : 11

Section Marks : 40

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 : 640653112672

Question Shuffling Allowed : No

Is Section Default? : null

Question Number : 35 Question Id : 640653770725 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 "FOUNDATION LEVEL: STATISTICS FOR DATA SCIENCE I (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 :

6406532578027. ✓ YES

6406532578028. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653112673

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 36 Question Id : 640653770749 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

Distance covered by a runner in the first five days of training are 3 km, 5 km, 3 km, 6 km, and 7 km. If the runner covers a distance of 4 km on the sixth day, then how does it affect his overall performance?

Options :

6406532578079. ❌ The mean of the distances will increase.

6406532578080. ❌ The mode of the distances will decrease.

6406532578081. ✓ The median of the distances will decrease.

6406532578082. ❌ Range of the distances will decrease.

Sub-Section Number : 3

Sub-Section Id : 640653112674

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 37 Question Id : 640653770748 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statement(s) is(are) correct?

Options :

6406532578075. ❌ Point-bi serial method is appropriate to find the association between two categorical variables.

6406532578076. ✓ Scatter plot is more appropriate to represent the relationship between two numerical variables.

6406532578077. ❌ There is no available method for determining the association between a categorical and a numerical variable.

6406532578078. ✓ Covariance can be computed only for two numerical variables.

Sub-Section Number : 4

Sub-Section Id : 640653112675

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 38 Question Id : 640653770726 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following option(s) is(are) correct ?

Options :

6406532578029. ✓ If A and B are independent events, then $P(A \cup B) = P(A) + P(B) - P(A)P(B)$.

6406532578030. ✗ If A and B are disjoint events, then $P(A \cup B) = P(A) + P(B) - P(A)P(B)$.

6406532578031. ✓ If A and B are disjoint events, then $P(A \cup B) = P(A) + P(B)$.

6406532578032. ✗ If A and B are independent events, then $P(A \cup B) = P(A) \times P(B)$.

Sub-Section Number : 5

Sub-Section Id : 640653112676

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 39 Question Id : 640653770744 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

In how many different ways can the letters of the word 'ENGLISH' be arranged such that the vowels always come together?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1440

Sub-Section Number : 6

Sub-Section Id : 640653112677

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770745 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 : (40 to 41)

Question Label : Comprehension

Consider a given dataset of weights (in kg) of persons such as 50, 55, 40, 60, 99, 90, 95, 60, 80, 75.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 40 Question Id : 640653770746 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

Five number summary (\min , Q_1 , Q_2 , Q_3 , \max)
of the given data is:

Options :

6406532578070. ✘ 40, 60, 75, 90, 99

6406532578071. ✓ 40, 55, 67.5, 90, 99

6406532578072. ✘ 50, 60, 94.5, 95, 99

6406532578073. ✘ 50, 60, 90, 95, 99

Question Number : 41 Question Id : 640653770747 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

Find the IQR (Inter-quartile range) of the given dataset.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

35

Sub-Section Number : 7

Sub-Section Id : 640653112678

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770727 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 : (42 to 43)

Question Label : Comprehension

A drawer of socks contains three black socks, four blue socks, and three grey socks. Two socks are chosen at random without replacement. Based on the information, answer the given subquestion.

Sub questions

Question Number : 42 Question Id : 640653770728 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

What is the probability that a black pair is chosen ? Enter the answer correct to two decimal places

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.04 to 0.10

Question Number : 43 Question Id : 640653770729 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

What is the probability that they are of same colour ? Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.24 to 0.30

Question Id : 640653770730 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 : (44 to 45)

Question Label : Comprehension

A family has two children. Assume being a male or female of a child is equally likely.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 44 Question Id : 640653770731 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

Find the probability that at least one child is a boy.

Options :

6406532578035.  $\frac{1}{2}$

6406532578036.  $\frac{1}{4}$

6406532578037.  $\frac{2}{3}$

6406532578038.  $\frac{3}{4}$

Question Number : 45 Question Id : 640653770732 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

What is the probability that both are boys given that at least one is a boy ? Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.30 to 0.36

Question Id : 640653770733 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 : (46 to 47)

Question Label : Comprehension

The probabilities of X and Y becoming principals in a college are $4/5$ and $1/5$ respectively. The probabilities that X and Y if selected would introduce co-education in the college are $1/6$ and $5/6$ respectively.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 46 Question Id : 640653770734 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 is the probability that co-education will be introduced in the college?

Options :

6406532578040.

$$\text{✖ } \frac{2}{15}$$

6406532578041. ✖ $\frac{1}{6}$

6406532578042. ✖ $\frac{5}{6}$

6406532578043. ✓ $\frac{3}{10}$

Question Number : 47 Question Id : 640653770735 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

If co-education has been introduced in the college, then what is the probability that X is principal ?
Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.40 to 0.48

Question Id : 640653770736 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 : (48 to 50)

Question Label : Comprehension

In a school function, there are 2 violinists, 3 pianists, and 1 flutist. They have to sit in a circular order for a performance. Based on the information, answer the given subquestions.

Sub questions

Question Number : 48 Question Id : 640653770737 Question Type : MSQ Is Question

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

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct options from the following:

Options :

6406532578045. ✓ Selection of performers will occur simultaneously.

6406532578046. ✗ Selection of performers will not occur simultaneously.

6406532578047. ✗ With replacement.

6406532578048. ✓ Without replacement.

Question Number : 49 Question Id : 640653770738 Question Type : MSQ Is Question

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

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct options from the following:

Options :

6406532578049. ✓ Order matters.

6406532578050. ✗ Order does not matter.

6406532578051. ✓ Permutation is used.

6406532578052. ✗ Combination is used.

Question Number : 50 Question Id : 640653770739 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

Find the number of ways in which performers can be arranged in a circular order such that no two violinists will sit together.

Options :

6406532578053. ✘ 120

6406532578054. ✘ 96

6406532578055. ✓ 72

6406532578056. ✘ 672

Question Id : 640653770740 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 : (51 to 53)

Question Label : Comprehension

In a class, there are 5 students who like Statistics and 4 students who like Mathematics. A committee of three students is to be formed.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 51 Question Id : 640653770741 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct options from the following:

Options :

6406532578057. ✓ Selection of students will occur simultaneously.

6406532578058. ✗ Selection of students will not occur simultaneously.

6406532578059. ✗ With replacement.

6406532578060. ✓ Without replacement.

Question Number : 52 Question Id : 640653770742 Question Type : MSQ Is Question

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

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct options from the following:

Options :

6406532578061. ✗ Order matters.

6406532578062. ✓ Order does not matter.

6406532578063. ✗ Permutation is used.

6406532578064. ✓ Combination is used.

Question Number : 53 Question Id : 640653770743 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

Find the number of ways in which the students can be selected such that at least one student likes Statistics.

Options :

6406532578065. ✘ 70

6406532578066. ✓ 80

6406532578067. ✘ 90

6406532578068. ✘ 85

Maths2

Section Id :	64065353275
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	9
Number of Questions to be attempted :	9
Section Marks :	25
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 :	640653112679
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 54 Question Id : 640653770750 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 "FOUNDATION LEVEL : MATHEMATICS FOR DATA SCIENCE II (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 :

6406532578083. ✓ YES

6406532578084. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653112680

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770751 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 : (55 to 58)

Question Label : Comprehension

$T : \mathbb{R}^2 \rightarrow \mathbb{R}^2$ is a linear transformation given by $T(2, 1) = (-1, -3)$ and $T(1, 2) = (-5, 0)$. The matrix representation of T with respect to the standard ordered basis $\beta = \{(1, 0), (0, 1)\}$ is $\begin{bmatrix} a & c \\ b & d \end{bmatrix}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 55 Question Id : 640653770752 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

Find the value of a .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 56 Question Id : 640653770753 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

Find the value of b .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-2

Question Number : 57 Question Id : 640653770754 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

Find the value of c .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-3

Question Number : 58 **Question Id :** 640653770755 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

Find the value of d .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Id : 640653770769 **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 : (59 to 60)

Question Label : Comprehension

Let $V = \left\{ \begin{pmatrix} x & -x \\ y & -y \end{pmatrix} : x, y \in \mathbb{R} \right\}$ and $T: V \rightarrow \mathbb{R}^3$ be a linear transformation

given by $T \left(\begin{pmatrix} x & -x \\ y & -y \end{pmatrix} \right) = (x, y, x + y)$. Based on this information, answer the given subquestions.

Sub questions

Question Number : 59 Question Id : 640653770770 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

Choose the correct option(s) from the following:

Options :

6406532578114. ✘ T is one-one and onto.

6406532578115. ✓ T is one-one but not onto.

6406532578116. ✘ T is not one-one but onto.

6406532578117. ✘ T is neither one-one nor onto.

Question Number : 60 Question Id : 640653770771 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct option(s) from the following:

Options :

6406532578118. ✘ A basis of V is given by $\left\{ \begin{pmatrix} 1 & -1 \\ 1 & -1 \end{pmatrix}, \begin{pmatrix} 1 & -1 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 \\ 1 & -1 \end{pmatrix} \right\}$.

6406532578119. ✓ Any matrix in V has rank less than or equal to 1.

6406532578120. ✓ Rank(T) is 2.

6406532578121. ✗ dim(V) is 3.

Sub-Section Number :	3
Sub-Section Id :	640653112681
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770756 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 : (61 to 63)

Question Label : Comprehension

Let V and W be two vector spaces. Suppose there exists an isomorphism T from V to W

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 61 Question Id : 640653770757 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following statements is true?

Options :

6406532578089. ✓ dim(V) = dim(W)

6406532578090. ✗ dim(V) < dim(W)

6406532578091. ✘ $\dim(V) > \dim(W)$

6406532578092. ✘ Insufficient information

Question Number : 62 Question Id : 640653770758 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Is the following statement true or false?

If $\{v_1, v_2, v_3\}$ are linearly independent vectors in V , then $\{T(v_1), T(v_2), T(v_3)\}$ are linearly independent vectors in W .

Options :

6406532578093. ✓ TRUE

6406532578094. ✘ FALSE

Question Number : 63 Question Id : 640653770759 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Is the following statement true or false?

Let $\{u_1, u_2, u_3\} \subset V$. If $\{T(u_1), T(u_2), T(u_3)\}$ is a linearly independent set in W , then $\{u_1, u_2, u_3\}$ is not necessarily a linearly independent set in V . In other words, $\{u_1, u_2, u_3\}$ could also be linearly dependent in V .

Options :

6406532578095. ✘ TRUE

6406532578096. ✓ FALSE

Question Id : 640653770760 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 : (64 to 66)

Question Label : Comprehension

Let $T : \mathbb{R}^3 \rightarrow \mathbb{R}^3$ be a linear transformation given by:

$$T(x, y, z) = (x - y, y - z, z - x)$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 64 Question Id : 640653770761 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

Find the nullity of T.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 65 Question Id : 640653770762 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following is a basis for the kernel of T?

Options :

6406532578098. ✓ $\{(1, 1, 1)\}$

6406532578099. ✗ $\text{span}\{(1, 1, 1)\}$

6406532578100. ✗ $\{(a, a, a) \mid a \in \mathbb{R}\}$

6406532578101. ✗ $\{(1, 0), (0, 1)\}$

6406532578102. ✗ $\{(1, 0, 0), (0, 1, 0)\}$

Question Number : 66 Question Id : 640653770763 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following is a basis for the image of T?

Options :

6406532578103. ✓ $\{(1, 0, -1), (-1, 1, 0)\}$

6406532578104. ✗ $\{(1, 0, -1), (-1, 1, 0), (0, -1, 1)\}$

6406532578105. ✗ $\{(1, 0, 0), (0, 1, 0), (0, 0, 1)\}$

6406532578106. * $\{(1, 0, 0), (0, 1, 0)\}$

Question Id : 640653770765 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 : (67 to 69)

Question Label : Comprehension

Let $W = \text{span}\{(1, 0, -1), (3, 1, 2), (2, 1, 3)\}$ and P_W be the projection of \mathbb{R}^3 onto W .

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 67 Question Id : 640653770766 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

What is rank of P_W ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 68 Question Id : 640653770767 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

What is nullity of P_W ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 69 **Question Id :** 640653770768 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

What is $\dim(W^\perp)$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Sub-Section Number : 4

Sub-Section Id : 640653112682

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770773 **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 : (70 to 71)

Question Label : Comprehension

Answer the given subquestions:

Sub questions

Question Number : 70 Question Id : 640653770774 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

Let A and B be $n \times n$ similar matrices.

Suppose A has exactly $n - 1$ linearly independent columns, then $\det(B)$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 71 Question Id : 640653770775 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

Let A be a 5×5 matrix of rank 3.

Let b be the third column of A and W be the affine subspace of \mathbb{R}^5 given by $W = \{x \in \mathbb{R}^5 : Ax = b\}$. What is the dimension of W ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number : 5

Sub-Section Id : 640653112683

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 72 **Question Id :** 640653770764 **Question Type :** MSQ **Is Question**

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

Correct Marks : 2 **Max. Selectable Options :** 0

Question Label : Multiple Select Question

Select all true statement(s).

Options :

A and B are square matrices of order n. If $\text{rank}(A) = k$, with $k \leq n$,
6406532578107. ✓ and $\text{rank}(B) = n$, then $\text{rank}(AB) = k$.

6406532578108. ✓ The rank of a matrix is equal to the maximum number of linearly independent columns.

The rank of a diagonal matrix is equal to the number of diagonal entries that
6406532578109. ✗ are zero.

6406532578110. ✗ For a matrix A of dimensions $m \times n$, $\text{rank}(A) + \text{nullity}(A) = m$.

Sub-Section Number : 6

Sub-Section Id : 640653112684

Question Shuffling Allowed : Yes

Is Section Default? :

null

Question Number : 73 Question Id : 640653770772 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

Choose the correct option(s) from the following:

Options :

6406532578122. ✓ If A and B are orthogonal matrices, then AB is also orthogonal.

6406532578123. ✓ If A is orthogonal, then A^{-1} is also an orthogonal matrix.

Let A be an $n \times n$ orthogonal matrix. Let R be the set of rows of A , thought of as a subset of \mathbb{R}^n . Similarly, let C be the set of columns of A .

6406532578124. ✗ Then exactly one of R or C is an orthogonal subset of vectors.

6406532578125. ✓ If A is an $n \times n$ orthogonal matrix, then $\|Ax\| = \|x\|$ for any $x \in \mathbb{R}^n$.

Statistics2

Section Id : 64065353276

Section Number : 5

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 12

Number of Questions to be attempted : 12

Section Marks : 40

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 :	640653112685
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 74 Question Id : 640653770776 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 "FOUNDATION LEVEL : STATISTICS FOR DATA SCIENCE II (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 :

6406532578128. ✓ YES

6406532578129. ✗ NO

Question Number : 75 Question Id : 640653770777 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

Discrete random variables:

Distribution	PMF ($f_X(k)$)	CDF ($F_X(x)$)	$E[X]$	$\text{Var}(X)$
Uniform(A) $A = \{a, a+1, \dots, b\}$	$\frac{1}{n}, \quad x = k$ $n = b - a + 1$ $k = a, a+1, \dots, b$	$\begin{cases} 0 & x < 0 \\ \frac{k-a+1}{n} & k \leq x < k+1 \\ & k = a, a+1, \dots, b-1, b \\ 1 & x \geq n \end{cases}$	$\frac{a+b}{2}$	$\frac{n^2-1}{12}$
Bernoulli(p)	$\begin{cases} p & x = 1 \\ 1-p & x = 0 \end{cases}$	$\begin{cases} 0 & x < 0 \\ 1-p & 0 \leq x < 1 \\ 1 & x \geq 1 \end{cases}$	p	$p(1-p)$
Binomial(n, p)	${}^n C_k p^k (1-p)^{n-k},$ $k = 0, 1, \dots, n$	$\begin{cases} 0 & x < 0 \\ \sum_{i=0}^k {}^n C_i p^i (1-p)^{n-i} & k \leq x < k+1 \\ & k = 0, 1, \dots, n \\ 1 & x \geq n \end{cases}$	np	$np(1-p)$
Geometric(p)	$(1-p)^{k-1} p,$ $k = 1, \dots, \infty$	$\begin{cases} 0 & x < 0 \\ 1 - (1-p)^k & k \leq x < k+1 \\ & k = 1, \dots, \infty \end{cases}$	$\frac{1}{p}$	$\frac{1-p}{p^2}$
Poisson(λ)	$\frac{e^{-\lambda} \lambda^k}{k!},$ $k = 0, 1, \dots, \infty$	$\begin{cases} 0 & x < 0 \\ e^{-\lambda} \sum_{i=0}^k \frac{\lambda^i}{i!} & k \leq x < k+1 \\ & k = 0, 1, \dots, \infty \end{cases}$	λ	λ

Continuous random variables:

Distribution	PDF ($f_X(k)$)	CDF ($F_X(x)$)	$E[X]$	$\text{Var}(X)$
Uniform $[a, b]$	$\frac{1}{b-a}, a \leq x \leq b$	$\begin{cases} 0 & x \leq a \\ \frac{x-a}{b-a} & a < x < b \\ 1 & x \geq b \end{cases}$	$\frac{a+b}{2}$	$\frac{(b-a)^2}{12}$
Exp(λ)	$\lambda e^{-\lambda x}, x > 0$	$\begin{cases} 0 & x \leq 0 \\ 1 - e^{-\lambda x} & x > 0 \end{cases}$	$\frac{1}{\lambda}$	$\frac{1}{\lambda^2}$
Normal(μ, σ^2)	$\frac{1}{\sigma\sqrt{2\pi}} \exp\left(\frac{-(x-\mu)^2}{2\sigma^2}\right),$ $-\infty < x < \infty$	No closed form	μ	σ^2
Gamma(α, β)	$\frac{\beta^\alpha}{\Gamma(\alpha)} x^{\alpha-1} e^{-\beta x}, x > 0$		$\frac{\alpha}{\beta}$	$\frac{\alpha}{\beta^2}$
Beta(α, β)	$\frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} x^{\alpha-1} (1-x)^{\beta-1}$ $0 < x < 1$		$\frac{\alpha}{\alpha+\beta}$	$\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$

1. **Markov's inequality:** Let X be a discrete random variable taking non-negative values with a finite mean μ . Then,

$$P(X \geq c) \leq \frac{\mu}{c}$$

2. **Chebyshev's inequality:** Let X be a discrete random variable with a finite mean μ and a finite variance σ^2 . Then,

$$P(|X - \mu| \geq k\sigma) \leq \frac{1}{k^2}$$

3. **Weak Law of Large numbers:** Let $X_1, X_2, \dots, X_n \sim \text{iid } X$ with $E[X] = \mu, \text{Var}(X) = \sigma^2$.

Define sample mean $\bar{X} = \frac{X_1 + X_2 + \dots + X_n}{n}$. Then,

$$P(|\bar{X} - \mu| > \delta) \leq \frac{\sigma^2}{n\delta^2}$$

4. **Using CLT to approximate probability:** Let $X_1, X_2, \dots, X_n \sim \text{iid } X$ with $E[X] = \mu, \text{Var}(X) = \sigma^2$.

Define $Y = X_1 + X_2 + \dots + X_n$. Then,

$$\frac{Y - n\mu}{\sqrt{n}\sigma} \approx \text{Normal}(0, 1).$$

Useful data:

1. Use the following values of F_Z if required:

$$F_Z(1) = 0.84, F_Z(1.92) = 0.97, F_Z(0) = 0.5$$

$$2. \int x^n dx = \frac{x^{n+1}}{n+1}.$$

Options :

6406532578130. ✓ Useful Data has been mentioned above.

6406532578131. ❗ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 640653112686

Question Shuffling Allowed : Yes

Is Section Default? :

null

Question Number : 76 Question Id : 640653770778 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 $X_1, X_2, \dots, X_{36} \sim \text{i.i.d. Bernoulli}(0.5)$. Define a new random variable

$$Y = X_1 + X_2 + \dots + X_{36}.$$

Using the Central limit theorem, find the approximate value of $P(Y \leq 21)$. Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.81 to 0.87

Question Number : 77 Question Id : 640653770779 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 X and Y be two continuous random variables with joint PDF

$$f_{XY}(x, y) = \begin{cases} x + cy^2, & \text{if } 0 \leq x \leq 1 \text{ and } 0 \leq y \leq 1, \\ 0, & \text{otherwise.} \end{cases}$$

Find the value of c . Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1.5

Sub-Section Number :	3
Sub-Section Id :	640653112687
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 78 Question Id : 640653770781 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 X and Y are two independent random variables with probability density functions as

$$g(x) = \begin{cases} \frac{8}{x^3}, & x > 2, \\ 0, & \text{otherwise.} \end{cases}$$

and

$$h(y) = \begin{cases} 2y, & 0 < y < 1, \\ 0, & \text{otherwise.} \end{cases}$$

Calculate the value of $E[XY]$.**Options :**

6406532578138. ✘ 2

6406532578139. ✘ $\frac{2}{3}$ 6406532578140. ✓ $\frac{8}{3}$

6406532578141. ✘ Insufficient information

Question Number : 79 Question Id : 640653770782 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 X_1, X_2, \dots, X_{100} be i.i.d. samples with mean 150 and variance 100. Find the mean and variance of \bar{X} , where $\bar{X} = \frac{X_1 + X_2 + \dots + X_{100}}{100}$ is the sample mean.

Options :

6406532578142. ✘ $E[\bar{X}] = 150, \text{Var}(\bar{X}) = 100$

6406532578143. ✘ $E[\bar{X}] = 150, \text{Var}(\bar{X}) = 10$

6406532578144. ✓ $E[\bar{X}] = 150, \text{Var}(\bar{X}) = 1$

6406532578145. ✘ $E[\bar{X}] = 1500, \text{Var}(\bar{X}) = 10$

Sub-Section Number : 4

Sub-Section Id : 640653112688

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 80 Question Id : 640653770780 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

The joint PMF table of two discrete random variable X_1 and X_2 is given as

$X_2 \backslash X_1$	1	2
1	$\frac{1}{3}$	$\frac{1}{6}$
2	$\frac{1}{6}$	k

Which of the following option(s) is(are) true?

Options :

6406532578134. ✓ $f_{X_1}(2) = f_{X_2}(2)$

6406532578135. ✗ $f_{X_1}(1) \neq f_{X_2}(1)$

6406532578136. ✗ X_1 and X_2 are independent.

6406532578137. ✓ X_1 and X_2 are not independent.

Sub-Section Number : 5

Sub-Section Id : 640653112689

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770783 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 : (81 to 82)

Question Label : Comprehension

The joint probability density function of two continuous random variables X and Y is given as,

$$f(x, y) = \begin{cases} 8xy, & 0 \leq y \leq x \leq 1, \\ 0, & \text{otherwise} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 81 Question Id : 640653770784 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

Find the marginal density of X .

Options :

6406532578146. ❌ $f_X(x) = \begin{cases} 4x, & 0 \leq x \leq 1, \\ 0, & \text{otherwise.} \end{cases}$

6406532578147. ❌ $f_X(x) = \begin{cases} 4x, & y \leq x \leq 1, \\ 0, & \text{otherwise.} \end{cases}$

6406532578148. ✓ $f_X(x) = \begin{cases} 4x^3, & 0 \leq x \leq 1, \\ 0, & \text{otherwise.} \end{cases}$

6406532578149. ❌ $f_X(x) = \begin{cases} 4x^3, & y \leq x \leq 1, \\ 0, & \text{otherwise.} \end{cases}$

Question Number : 82 Question Id : 640653770785 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What is the value of $E[X]$? Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.8

Question Id : 640653770786 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 : (83 to 84)

Question Label : Comprehension

In a large town, it is estimated that 20% of students own a laptop. A random sample of 400 students is selected from the town.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 83 Question Id : 640653770787 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

Let a random variable X denote the total number of students without laptops in the selected sample. Which of the following options is a good model for X ?

Options :

6406532578151. ✘ $X \sim \text{Bernoulli}(0.5)$

6406532578152. ✘ $X \sim \text{Bernoulli}(0.2)$

6406532578153. ✓ $X \sim \text{Binomial}(400, 0.8)$

6406532578154. ✘ $X \sim \text{Binomial}(400, 0.2)$

Question Number : 84 Question Id : 640653770788 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

Using the Central Limit Theorem, find an approximate probability that at least 80 students in the selected random sample own a laptop. Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Question Id : 640653770789 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 : (85 to 86)

Question Label : Comprehension

A random sample of size n is taken from a population with mean μ and standard deviation 25.

The sample mean is $\bar{X} = \frac{X_1 + X_2 + \dots + X_n}{n}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 85 Question Id : 640653770790 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following inequalities result from Chebyshev's inequality?

Options :

6406532578156. ✓ $P(|\bar{X} - \mu| \leq 5) \geq 1 - \frac{25}{n}$

6406532578157. ✗ $P(|\bar{X} - \mu| \leq 5) \geq 1 - \frac{1}{n}$

6406532578158. ✓ $P(|\bar{X} - \mu| \geq 5) \leq \frac{25}{n}$

6406532578159. ✗ $P(|\bar{X} - \mu| \geq 5) \leq \frac{1}{n}$

Question Number : 86 Question Id : 640653770791 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Find the minimum value of n such that the sample mean lies in $[\mu - 5, \mu + 5]$ with probability more than 0.95 using Chebyshev's inequality.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

498 to 502

Question Id : 640653770792 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 : (87 to 88)

Question Label : Comprehension

The joint density of two continuous random variables X and Y is given by

$$f_{XY}(x, y) = \begin{cases} \frac{x+y}{k}, & 0 < x < 1, 0 < y < 1, \\ 0, & \text{otherwise.} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 87 Question Id : 640653770793 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Find the value of k .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 88 Question Id : 640653770794 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 is the value of

$$P\left(X < \frac{1}{2}, Y < \frac{1}{2}\right) ?$$

Options :

6406532578162. ✘ $\frac{1}{16}$

6406532578163. ✓ $\frac{1}{8}$

6406532578164. ✘ $\frac{1}{2}$

6406532578165. ✘ $\frac{1}{4}$

Question Id : 640653770795 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 : (89 to 90)

Question Label : Comprehension

The joint PMF table of two discrete random variables X and Y is given as

\backslash	X	0	1
Y			
0		$\frac{1}{12}$	$\frac{1}{6}$
1		$\frac{1}{6}$	$\frac{1}{3}$
2		$\frac{1}{12}$	$\frac{1}{6}$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 89 Question Id : 640653770796 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

Find the value of $\text{Cov}(X, Y)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 90 Question Id : 640653770797 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

What conclusion will you make based on the obtained value in the given part?

Options :

6406532578167. ✘ There is a positive linear relationship between the variables X and Y .

6406532578168. ✘ There is a negative linear relationship between the variables X and Y .

6406532578169. ✓ There is no linear relationship between the variables X and Y .

6406532578170. ✘ We cannot conclude anything.

DBMS

Section Id :	64065353277
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	14
Number of Questions to be attempted :	14
Section Marks :	50
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 :	640653112690
Question Shuffling Allowed :	No
Is Section Default? :	null

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 : DATABASE MANAGEMENT SYSTEMS (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 :

6406532578171. ✓ YES

6406532578172. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653112691

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 92 Question Id : 640653770799 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 P and Q be two relations. Let D(P) be a decomposition of P based on a set M of functional dependencies. Let D(Q) be a decomposition of Q based on a set N of functional dependencies. It is known that one among D(P) and D(Q) is in 3NF and the other is in 2NF. In order to correctly classify D(P) and D(Q) as being in 3NF or 2NF, what is the MINIMAL test needed?

Options :

6406532578173. ✘ Test whether both are in 3NF

6406532578174. ✘ Test whether both are in 2NF

6406532578175. ✘ Test whether one of them is in 2NF

6406532578176. ✓ Test whether one of them is in 3NF

Question Number : 93 Question Id : 640653770800 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 $R_1(X, Y, Z)$ be a relation. Let $R_2(P, Q, R, S, Z)$ be another relation with the following functional dependencies:

$$\mathcal{F} = P \rightarrow QR, R \rightarrow S, Z \rightarrow P$$

R_1 contains 60 tuples and R_2 contains 100 tuples. What are the maximum and minimum number of tuples possible as output of $R_1 \bowtie R_2$?

Options :

6406532578177. ✓ Maximum= 60, Minimum= 0

6406532578178. ✘ Maximum= 100, Minimum= 60

6406532578179. ✘ Maximum= 100, Minimum= 0

6406532578180. ✘ Maximum= 60, Minimum= 40

Sub-Section Number : 3

Sub-Section Id : 640653112692

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 94 Question Id : 640653770801 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 table Sample as shown below:

A	B	C	D
a1	b1	c1	d1
a1	b2	X	d2
a1	b2	c2	Y
a1	P	Q	d2

If the functional dependency $B \rightarrow C$ and multivalued dependency $A \rightarrow\rightarrow BC$ hold on table Sample, then what will be the values of X, Y, P, and Q?

Options :

6406532578181. ✘ X: c2, Y: d1, P: b2, Q: c2

6406532578182. ✘ X: c2, Y: d2, P: b2, Q: c2

6406532578183. ✘ X: c1, Y: d1, P: b1, Q: c1

6406532578184. ✓ X: c2, Y: d1, P: b1, Q: c1

Sub-Section Number : 4**Sub-Section Id :** 640653112693**Question Shuffling Allowed :** Yes**Is Section Default? :** null**Question Number : 95 Question Id : 640653770802 Question Type : MSQ Is Question****Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0****Correct Marks : 3 Max. Selectable Options : 0**

Question Label : Multiple Select Question

Consider the following table:

CarID	CarName	Country	Price
001	Ferrari	Italy	200000
002	Mercedes	Germany	150000
003	McLaren	UK	120000
004	Aston Martin	UK	120000
005	Alpha Tauri	Italy	200000
006	Koenigsegg	Sweden	500000
007	Alpine	France	300000

Table 1: Cars

Which of the following functional dependencies hold on the **Cars** table instance?

Options :

6406532578185. ✓ $CarID \rightarrow CarName$

6406532578186. ✗ $Price \rightarrow CarName$

6406532578187. ✗ $Country \rightarrow CarName$

6406532578188. ✓ $Country \rightarrow Price$

Question Number : 96 Question Id : 640653770805 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider a relation student(*roll_no, name, marks*). If all students have the same marks, then which of the following functional dependency/dependencies cannot be held in the student table?

Options :

6406532578197. ✓ $name \rightarrow marks$

6406532578198. ✖ marks → roll_no

6406532578199. ✓ roll_no → marks

6406532578200. ✖ marks → name

Sub-Section Number :	5
Sub-Section Id :	640653112694
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 97 Question Id : 640653770803 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 the relation Songs(*Song_Name, Artist, Genre, Duration, Album*) with the following set of functional dependencies.

$\mathcal{F} = \{Song_Name \rightarrow Artist,$

$Artist \rightarrow Genre,$

$(Album, Song_Name) \rightarrow Duration\}$

Which of the following statements is FALSE with respect to the information given?

Options :

6406532578189. ✓ The relation Songs is in 2NF

6406532578190. ✓ The functional dependency $Artist \rightarrow Genre$ is an example of partial dependency

6406532578191. ✖ The relation Songs is in 1NF

6406532578192. ✖ The functional dependency $Song_Name \rightarrow Artist$ violates 2NF

Question Number : 98 Question Id : 640653770804 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 the Binary Search Tree (BST) shown in figure 1

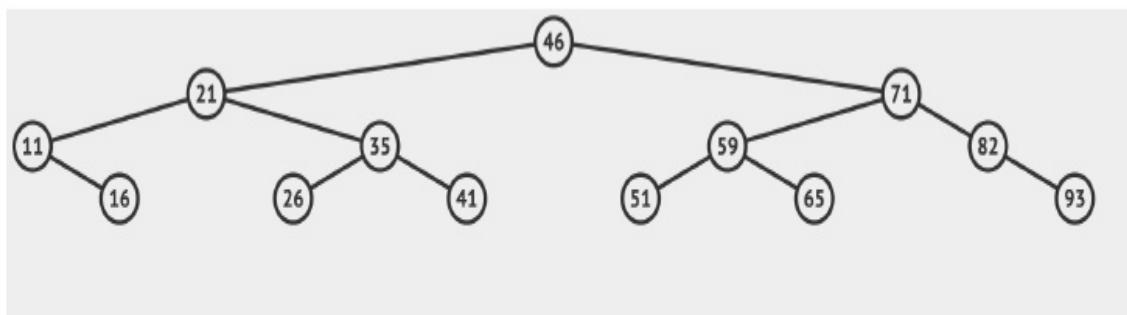


Figure 1: Binary Search Tree (BST)

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

Options :

6406532578193. ✓ 46,71,21,11,35,26,16,82,93,59,65,41,51

6406532578194. ✗ 46,71,21,11,26,35,82,93,16,59,65,41,51

6406532578195. ✓ 46,21,71,35,11,26,16,82,93,59,65,41,51

6406532578196. ✗ 46,21,71,35,11,16,26,82,93,41,65,59,51

Sub-Section Number : 6

Sub-Section Id : 640653112695

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 99 Question Id : 640653770806 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Consider a relation $R(A, B, C, D, E, F)$, having the following set of functional dependencies.

$$\mathcal{F} = \{A \rightarrow B, CD \rightarrow E, E \rightarrow F, F \rightarrow B\}$$

What is the total number of candidate keys of relation R?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Sub-Section Number : 7

Sub-Section Id : 640653112696

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 100 **Question Id :** 640653770808 **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

Consider a disk having 128 tracks per surface, 512 sectors per track and 256 bytes/sector. If the minimum number of bits required to access a sector is 22, then find out the number of platters required?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Sub-Section Number :	8
Sub-Section Id :	640653112697
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 101 Question Id : 640653770807 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 string of pending block references in the given order: 4, 5, 2, 5, 3, 4, 2, 5, 3, 4. The system has a buffer with 3 slots. Assume that initially the buffer is empty. If LRU buffer replacement policy is used, then how many misses will occur while referencing all the requested blocks ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

9

Question Number : 102 Question Id : 640653770809 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 table student and course in the university database as shown in below.

ID	name	dept_name
21f11	Ram	CS
21f12	Rakesh	ME
21f13	Pranav	EE
21f14	Rajib	CS
21f15	Vikash	BT

Table 2: student

course_id	title	dept_name
C001	DBMS	CS
C002	CAD	ME
C003	Digital	EE
C004	PDSA	CS

Table 3: course

Based on the given student and course table, what will be the output of the Python code given below?

```
import psycopg2
def connectDb(dbname, username, pwd, address, portnum):
    try:
        connection = psycopg2.connect(database = dbname,
                                      user = username,
                                      password = pwd,
                                      host = address,
                                      port = portnum)

        cursor = connection.cursor()
        query = '''SELECT ID FROM student, course
                   EXCEPT ALL
                   SELECT ID FROM student
                   EXCEPT ALL
                   SELECT ID FROM student'''
        cursor.execute(query)
        result = cursor.fetchall()
        count=0
        for row in result:
            count=count+1
            print(count)

        cursor.close()

    except (Exception, psycopg2.DatabaseError) as error:
        print(error)
    finally:
        connection.close()
connectDb("university", "postgres", "root", "127.0.0.1", "5432")
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Sub-Section Number :	9
Sub-Section Id :	640653112698
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770810 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 : (103 to 104)

Question Label : Comprehension

Answer the given subquestions based on the below information:

Consider the relation $R(P,Q,R,S,T,U,V)$ with the following set of functional dependencies.

$$\mathcal{F} = \{S \rightarrow PQ, Q \rightarrow R, P \rightarrow T, T \rightarrow UV, V \rightarrow S\}$$

Sub questions

Question Number : 103 Question Id : 640653770811 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 will be a lossless join decomposition of relation R ?

Options :

6406532578205. ❌ $R_1(P, Q, R), R_2(R, S, T, U, V)$

6406532578206. ❌ $R_1(P, Q, S, U), R_2(R, T, U, V)$

6406532578207. ✓ $R_1(P, Q, R, S), R_2(S, T, U, V)$

6406532578208. ✘ $R_1(P, Q, U), R_2(R, S, T, U, V)$

Question Number : 104 Question Id : 640653770812 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

What is the highest normal form achievable by the given relation?

Options :

6406532578209. ✓ 2NF

6406532578210. ✘ 1NF

6406532578211. ✘ 3NF

6406532578212. ✘ BCNF

Sub-Section Number : 10

Sub-Section Id : 640653112699

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770813 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 : (105 to 106)

Question Label : Comprehension

The sports federation FIA has decided to maintain a database of all the drivers, races and budgets for the 2024 Formula 1 Season. Below is the original database structure designed by FIA:

FormulaOne(*Driver_ID*, *Driver_Name*, *Race*, *Points*, *Team_Name*, *Team_Budget*)

The functional dependencies applicable to **FormulaOne** are:

$$\mathcal{F} = \{ \text{Driver_ID} \rightarrow \text{Driver_Name}, \\ (\text{Driver_ID}, \text{Race}) \rightarrow \text{Points}, \\ \text{Driver_ID} \rightarrow \text{Team_Name}, \\ \text{Team_Name} \rightarrow \text{Team_Budget} \}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 105 Question Id : 640653770814 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following functional dependencies violate the condition for the given relation to be in 2 NF?

Options :

6406532578213. ✓ $\text{Driver_ID} \rightarrow \text{Driver_Name}$

6406532578214. ✗ $(\text{Driver_ID}, \text{Race}) \rightarrow \text{Points}$

6406532578215. ✓ $\text{Driver_ID} \rightarrow \text{Team_Name}$

6406532578216. ✗ $\text{Team_Name} \rightarrow \text{Team_Budget}$

Question Number : 106 Question Id : 640653770815 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 decompositions will help to achieve 2 NF?

Options :

Table 1: Drivers (*Driver_ID, Driver_Name*)

Table 2: Races (*Driver_ID, Race, Points*)

6406532578217. ✓ Table 3: Teams (*Driver_ID, Team_Name, Team_Budget*)

Table 1: Drivers (*Driver_ID, Driver_Name*)

Table 2: Races (*Driver_ID, Race, Points, Team_Name*)

6406532578218. ✗ Table 3: Teams (*Team_Name, Team_Budget*)

Table 1: Drivers (*Driver_ID, Driver_Name, Points*)

Table 2: Races (*Driver_ID, Race, Points*)

6406532578219. ✗ Table 3: Teams (*Team_Name, Team_Budget*)

Table 1: Drivers (*Driver_ID, Driver_Name*)

Table 2: Races (*Driver_ID, Race, Points*)

6406532578220. ✗ Table 3: Teams (*Team_Name, Team_Budget, Driver_Name*)

PDSA

Section Id : 64065353278

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

Section Negative Marks :

0

Group All Questions :

No

Enable Mark as Answered Mark for Review and

Yes

Clear Response :

Maximum Instruction Time :

0

Sub-Section Number :

1

Sub-Section Id :

640653112700

Question Shuffling Allowed :

No

Is Section Default? :

null

Question Number : 107 Question Id : 640653770816 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 :

6406532578221. ✓ YES

6406532578222. ✗ NO

Sub-Section Number :

2

Sub-Section Id :

640653112701

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 108 Question Id : 640653770818 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

In the context of the **Floyd-Warshall algorithm**, what does it mean if the distance matrix has a negative value in its diagonal?

Options :

6406532578227. ✓ The graph has a negative-weight cycle.

6406532578228. ✗ The graph has negative-weight on edge but no negative-weight cycle.

6406532578229. ✗ The graph is acyclic.

6406532578230. ✗ The graph has a disconnected component.

Sub-Section Number : 3

Sub-Section Id : 640653112702

Question Shuffling Allowed : Yes

Is Section Default? : null

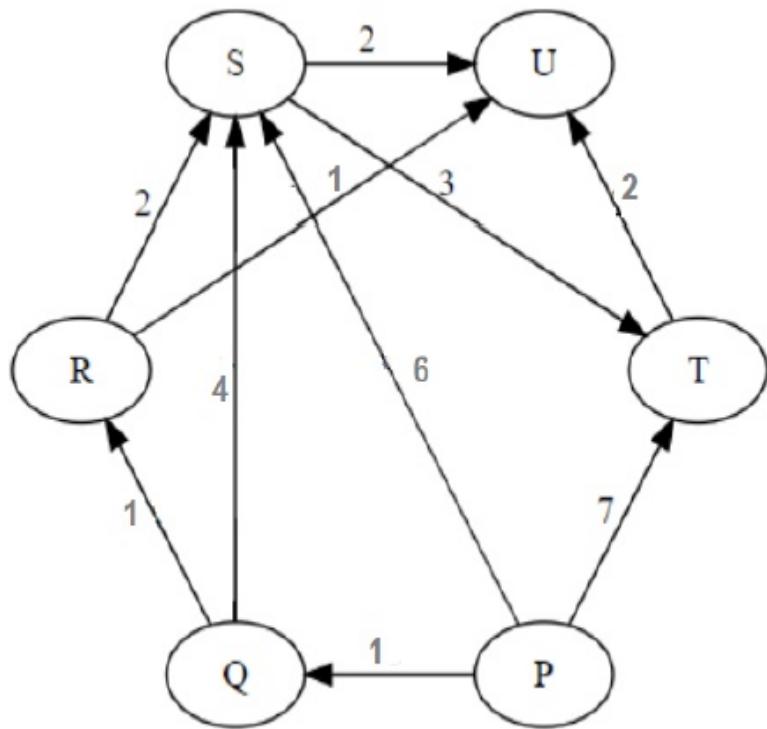
Question Number : 109 Question Id : 640653770817 Question Type : MCQ Is Question

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.



If Dijkstra's algorithm is used with **P** as the source vertex then what is the order in which all vertices are visited?

Options :

6406532578223. ✘ P, Q, R, U, T, S

6406532578224. ✘ P, Q, R, S, T, U

6406532578225. ✘ P, Q, R, S, U, T

6406532578226. ✓ P, Q, R, U, S, T

Question Number : 110 Question Id : 640653770821 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

You have a **max-heap** with the following set of elements:

{10, 5, 15, 3, 8, 12}

Which of the following elements is guaranteed to be a child of the element **15**?

Options :

6406532578239. ✘ 10

6406532578240. ✘ 5

6406532578241. ✓ 12

6406532578242. ✘ 8

Question Number : 111 Question Id : 640653770823 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 sequence of numbers inserted into an empty **Binary Search Tree(BST)**:

50, 30, 20, 40, 70, 60, 80, 35

What will be the height of the resulting BST? Consider that the height of empty binary search tree is 0.

Options :

6406532578244. ✘ 3

6406532578245. ✓ 4

6406532578246. ✘ 5

6406532578247. ✘ 6

Question Number : 112 Question Id : 640653770824 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 traversals would visit the nodes of a **binary search tree** in the following order?

10, 5, 3, 8, 15, 12, 20

Options :

6406532578248. ✘ In-order traversal

6406532578249. ✓ Pre-order traversal

6406532578250. ✘ Post-order traversal

Question Number : 113 Question Id : 640653770830 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

Apply the divide and conquer strategy to find the **closest pair of points** in a set. After dividing the set into two halves and recursively finding the closest pairs in each half, what additional step is required?

Options :

6406532578263. ✘ Combine the results directly

6406532578264. ✘ Perform a linear search for the closest pair

6406532578265. ✓ Consider pairs that span both halves

6406532578266. ✘ Sort the points by their distances

Question Number : 114 Question Id : 640653770832 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 recurrence relation for an algorithm:-

$$T(n) = 4T(n/2) + O(n)$$

Base Case:- $T(1) = 1$

The complexity of this algorithm is__ .

Options :

6406532578271. ✘ $O(n)$

6406532578272. ✘ $O(\log n)$

6406532578273. ✓ $O(n^2)$

6406532578274. ✘ $O(n \log n)$

Sub-Section Number :

4

Sub-Section Id :

640653112703

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 115 Question Id : 640653770819 Question Type : MCQ Is Question

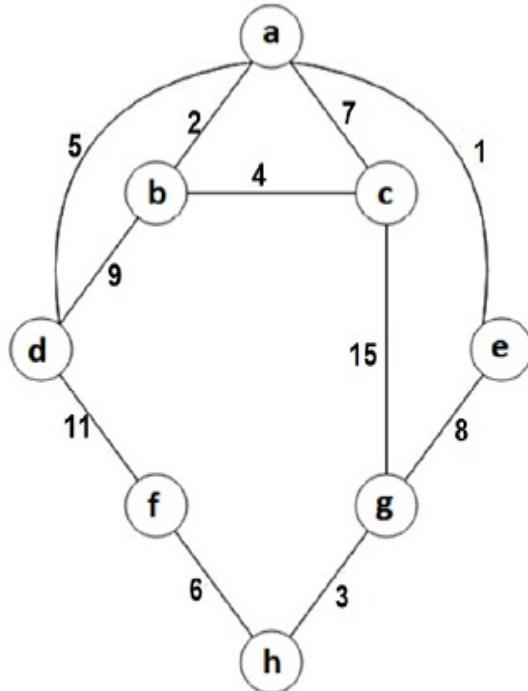
Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following graph.



If **Prim's algorithm** started with vertex **a** to construct a Minimum Spanning Tree, then what is the order in which vertices are marked visited?

Options :

6406532578231. ✓ a, e, b, c, d, g, h, f

6406532578232. ✗ a, e, b, c, g, h, d, f

6406532578233. ✗ a, e, b, d, c, h, g, f

6406532578234. ✗ a, e, b, d, c, g, f, h

Sub-Section Number : 5

Sub-Section Id : 640653112704

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 116 Question Id : 640653770826 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

For a set of symbols with probabilities of occurrence, which of the following statement(s) about the **Huffman tree** is/are correct?

Options :

6406532578256. ✓ Symbols with higher probabilities are generally closer to the root of the tree

6406532578257. ✗ Symbols with lower probabilities are generally closer to the root of the tree

6406532578258. ✗ The Huffman tree is always a complete binary tree

6406532578259. ✓ It generates prefix codes (no code is a prefix of another).

Sub-Section Number : 6

Sub-Section Id : 640653112705

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 117 Question Id : 640653770825 Question Type : MSQ Is Question

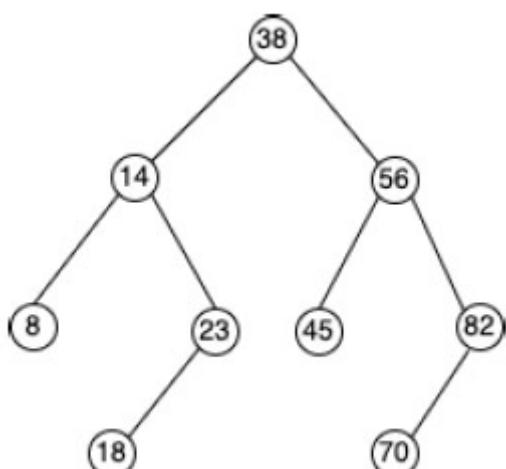
Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Define the **slope** of a node as the absolute difference in height between the left subtree and the right subtree of the node. Consider that the height of the empty tree is 0.

Consider the below AVL Tree.



After inserting **19** in the given AVL tree (before applying rotation), which of the following node's slopes will become greater than 1? Select all that are correct.

Options :

6406532578251. ✘ 38

6406532578252. ✘ 56

6406532578253. ✓ 14

6406532578254. ✘ 18

6406532578255. ✓ 23

Question Number : 118 Question Id : 640653770831 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following statements and choose the correct ones.

Options :

6406532578267. ✘ The worst case running time of Quick select algorithm to find the k th largest number is $O(n)$

6406532578268. ✓ The time taken to find the median in an unsorted list using the Median of Medians(MoM) algorithm is $O(n)$

6406532578269. ✓ The Quick select algorithm is an example of the divide-and-conquer approach.

6406532578270. ✘ Using the Fast Select (Quick Select using MoM for pivot selection) strategy, the worst-case running time will be $O(n^2)$ to find the k th largest number.

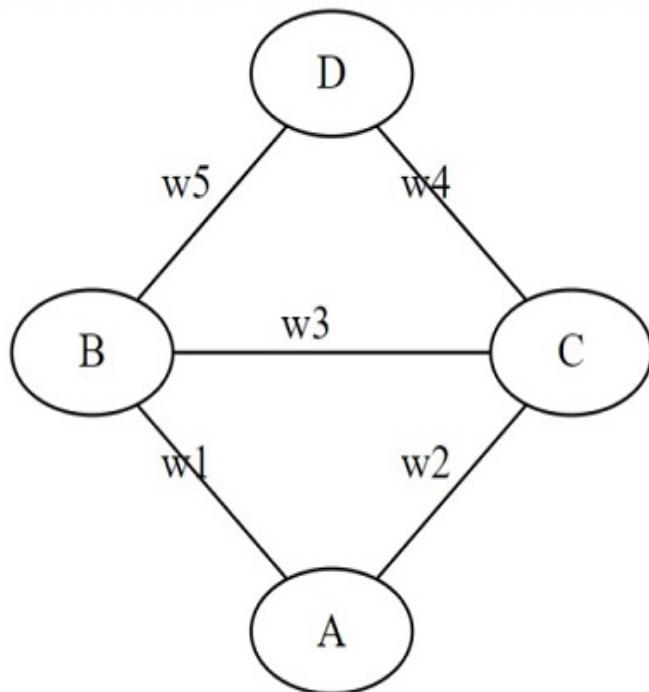
Sub-Section Id :	640653112706
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 119 Question Id : 640653770820 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 the following graph where w_1, w_2, w_3, w_4 , and w_5 represent the weights on edges.



Which of the following statement(s) is/are always **true** for the **Minimum Spanning Tree(MST)**?

Options :

6406532578235. ✓ If all given weights are distinct, then only one unique MST is possible.

6406532578236. ✗ If w_1 and w_2 are the same and largest among all weights and other weights are distinct, then only one unique MST is possible.

6406532578237. ✓ If w_1 and w_3 are the same and largest among all weights and other weights are distinct, then only one unique MST is possible.

6406532578238. ✓ If w_1 and w_4 are the same and smallest among all weights and other weights are distinct, then only one unique MST is possible.

Sub-Section Id :	640653112707
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 120 Question Id : 640653770822 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

Consider a binary tree with 21 nodes. The maximum number of leaves possible in tree is
_____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

11

Question Number : 121 Question Id : 640653770829 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 = [1, 3, 5, 7, 9, 8, 6, 4, 2]` is ____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

16

Sub-Section Number : 9

Sub-Section Id : 640653112708

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 122 Question Id : 640653770827 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

You are given a list of 7 activities to be conducted in a single available room, each represented by (start time, end time). If any activity finishes at time T, then another activity can be started at time T or afterwards.

Activities: [(1, 4), (3, 5), (0, 2), (2, 3), (5, 8), (8, 9), (5, 7)]

How many activities can be scheduled at most by following the timing constraints given above?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 123 Question Id : 640653770828 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

You are given a list of 8 meetings, each represented by a tuple (start time, end time). Your goal is to schedule all meetings in the minimum number of conference rooms. If a meeting ends at time t in a conference room, another meeting can start at time t or afterwards in the same room.

Meetings: [(1, 4), (6, 12), (2, 8), (11, 15), (3, 7), (5, 10), (9, 14), (13, 16)]

The minimum number of conference rooms needed to schedule all meetings is__.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

AppDev1

Section Id :	64065353279
Section Number :	8
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
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 :	640653112709

Question Shuffling Allowed :

No

Is Section Default? :

null

Question Number : 124 Question Id : 640653770833 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 (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 :

6406532578275. ✓ YES

6406532578276. ✗ NO

Sub-Section Number :

2

Sub-Section Id :

640653112710

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 125 Question Id : 640653770834 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

Consider the following code.

```
from flask import Flask
app = Flask(__name__)

@app.route('/home')
def home1():
    return "This is homepage 1"

@app.route('/home/')
def home2():
    return "This is homepage 2"

@app.errorhandler(404)
def page_not_found(e):
    return 'page not found'

app.run(debug=True)
```

If the flask application is running on <http://127.0.0.1:5000>, what will browser render for URL <http://127.0.0.1:5000/home/>

Options :

6406532578277. ❌ Page not found

6406532578278. ❌ This is homepage 1

6406532578279. ✓ This is homepage 2

6406532578280. ❌ Code will throw error

Question Number : 126 Question Id : 640653770841 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

Consider the following Flask code snippet.

```
from flask import Flask, request

app = Flask(__name__)
@app.route('/greet/<name>')
def greet(name):
    if name:
        return f'<h1>Hi, Mr/Ms/ {name} welcome to flask</h1>'
    else:
        return f'<h1>Hi, Mr/Ms/ <Unknown> welcome to flask</h1>'

app.run(debug=True)
```

If the application is running on a local server for the URL: <https://127.0.0.1:5000>, what will the browser render for the URL, <http://127.0.0.1:5000/greet/>?

Options :

6406532578305. ✘ **Hi, Mr/Ms/ None welcome to flask**

6406532578306. ✘ **Hi, Mr/Ms/ <unknown> welcome to flask**

6406532578307. ✘ **Bad request, Invalid name provided**

6406532578308. ✓ **Not Found**

Question Number : 127 Question Id : 640653770844 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

Consider the below statements about Cookies:

Statement 1: Cookies enable the web app to recognize the users

Statement 2: Cookies can include information about location, login data, and language etc.,

Which of the below is the correct option?

Options :

6406532578317. ❌ Statement 1 is correct and Statement 2 is incorrect

6406532578318. ❌ Statement 1 is incorrect and Statement 2 is correct

6406532578319. ✓ Both Statement 1 and Statement 2 are correct

6406532578320. ❌ Both Statement 1 and Statement 2 are incorrect

Question Number : 128 Question Id : 640653770845 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

Consider the below Flask code snippet:

```
from flask import Flask, jsonify
app = Flask(__name__)

@app.route('/api/courses')
def get_courses():
    courses = [{"id": "CS1001", "name" : 'CT'}, {"id" : 'CS1002',
                                                 'name': 'PDSA'}]
    return jsonify(courses)
```

If the application is running locally, what will be the **status** code and **mimetype** of the response for the URL, **http://127.0.0.1:5000/api/courses**?

Options :

status=404 and mimetype='application/json'

6406532578321. ❌

6406532578322. ✓

`status=200 and mimetype='application/json'`

`status=200 and mimetype='text/javascript'`

6406532578323. ✘

`status=404 and mimetype='text/javascript'`

6406532578324. ✘

Sub-Section Number : 3

Sub-Section Id : 640653112711

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 129 Question Id : 640653770838 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 a character set M, which consists of only those characters used in the statement, "sphinx of black quartz judge my vow" If this statement is to be saved in a document with minimum encoding, what will be the size of the document given that no other information or context is to be saved?

Options :

6406532578293. ✘ 145 bits

6406532578294. ✘ 245 bits

6406532578295. ✓ 175 bits

6406532578296. ✘ 256 bits

Question Number : 130 Question Id : 640653770839 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 Python code snippet.

```
from string import Template

text = "The $color car is parked in front of the $building."

template = Template(text)

print(== OUTPUT ==)
```

Which of the following statements, when substituted in place of == OUTPUT ==, will throw a KeyError?

Options :

6406532578297. ✓ `template.substitute({'color':'red'})`

6406532578298. ✗ `template.substitute({'color':'blue','building':'office',
'place': 'Chennai'})`

6406532578299. ✗ `template.safe_substitute({'color':'green'})`

6406532578300. ✗ `template.safe_substitute({'color':'yellow','building':'apartm
ent', 'place': 'Chennai'})`

Question Number : 131 Question Id : 640653770840 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

Software packages A and B of complexity $O(n \log n)$ and $O(n^2)$, respectively, spend exactly $T_A(n) = C_A n \log_{10}(n)$ and $T_B(n) = C_B n^2$ milliseconds to process n data items.

During a test, the average time of processing $n = 10^7$ data items with the package A and B is 420 milliseconds and 350 milliseconds, respectively. The time taken (in milliseconds) by software package A and B to process 10^8 data items, respectively will be?

Options :

6406532578301. ✘ 48 and 35

6406532578302. ✘ 480 and 350

6406532578303. ✓ 480 and 35000

6406532578304. ✘ 48000 and 35000

Question Number : 132 Question Id : 640653770843 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 “loans” table below, and its model class “Loans” associated with the table “loans” in the SQLite db.

ID	application_date	approved_status	Remarks
1	27/01/2023	Yes	All docs verified
2	29/03/2023	No	The mortgage doc is missing
3	13/04/2023	No	The payslip doc is not enclosed
4	03/08/2023	No	TDS doc is not enclosed
6	10/12/2023	Yes	All docs verified
7	17/12/2023	Yes	All docs verified

What is the correct output of the `flask_sqlalchemy` commands below?

```
loans=Loans.query.filter_by(approved_status= "No").all()
for l in loans:
    print(l.ID, ", ", l.approved_status, ", ", l.remarks)
```

Options :

1, Yes, All docs verified
6, Yes, All docs verified
7, Yes, All docs verified

6406532578313. ✘

2, No, All docs verified
3, No, All docs verified
4, No, All docs verified

6406532578314. ✘

1, No, All docs verified
6, No, All docs verified
7, No, All docs verified

6406532578315. ✘

2, No, The mortgage doc is missing
3, No, Payslip doc is not enclosed
4, No, TDS doc is not enclosed

6406532578316. ✓

Question Number : 133 Question Id : 640653770846 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 Python code snippet.

```
def modify(func):
    def wrapper(name):
        print("Before function execution")
        result = func(name)
        print("After function execution")
        return result
    return wrapper

@modify
def greet(name):
    return f"Hello, {name}!"

print(greet("Ram"))
```

What will be the output of the code on the terminal?

Options :

Before function execution
After function execution
Hello, Ram!

6406532578325. ✓

Hello, Ram!
Before function execution
After function execution

6406532578326. *

6406532578327. *

Before function execution

Hello, Ram!

After function execution

Hello, Ram!

6406532578328. *

Sub-Section Number : 4

Sub-Section Id : 640653112712

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 134 Question Id : 640653770848 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following Python code snippet.

```
import logging
import sys

logging.basicConfig(level=logging.INFO,
                    format='%(levelname)s - %(message)s')

num1, num2 = int(sys.argv[1]), int(sys.argv[2])

logging.info("This operation checks factors")

if num1 % num2 == 0:
    logging.debug(f"{num2} is a factor of {num1}")
else:
    logging.warning(f"{num2} is not the factor of {num1}")
```

What will be the output of the above code on the terminal for the command:

python log.py 25 5

Options :

6406532578333. ❌

INFO - This operation checks factors
WARNING - 5 is not the factor of 25

6406532578334. ❌

INFO - This operation checks factors
DEBUG - 5 is a factor of 25

6406532578335. ✓

INFO - This operation checks factors

6406532578336. ❌

DEBUG - 5 is a factor of 25

Sub-Section Number :

5

Sub-Section Id :

640653112713

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 135 Question Id : 640653770835 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following flask application.

app.py

```
from flask import Flask, abort, request

app = Flask(__name__)

@app.route('/validate/<int:number>')
def validate_number(number):
    if number % 2 == 0 and number % 3 == 1:
        abort(400, "Bad Request: Invalid number provided")
    return f'<h1>Valid Number: {number}</h1>'

app.run(debug=True)
```

Which of the following statements is/are true if the application is running locally on <http://127.0.0.1:5000> ?

Options :

For URL <http://127.0.0.1:5000/validate/4> the browser will render
6406532578281. ✘ Valid Number: 4

For URL <http://127.0.0.1:5000/validate?number=5> the browser will render
6406532578282. ✘ Bad Request: Invalid number provided

For URL <http://127.0.0.1:5000/validate/4> the browser will render
6406532578283. ✓ Bad Request: Invalid number provided

For URL `http://127.0.0.1:5000/validate/5` the browser will render
6406532578284. ✓ **Valid Number: 5**

Question Number : 136 Question Id : 640653770836 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following flask application.

`app.py`

```
from flask import Flask, abort, request

app = Flask(__name__)

@app.route('/process')
def process():
    username = request.args.get('uname', 'MAD-I')
    if username.isnumeric():
        abort(400, "Bad Request: Numeric username provided")
    return f'<h1>Valid Username: {username}</h1>'

app.run(debug=True)
```

Which of the following statements is/are true if the application is running locally on <http://127.0.0.1:5000> ?

Options :

For URL `http://127.0.0.1:5000?uname=MAD-II` the browser will render
6406532578285. ✖ **Valid Username: MAD-II**

For URL `http://127.0.0.1:5000/process` the browser will render
6406532578286. ✓ **Valid Username: MAD-I**

For URL `http://127.0.0.1:5000/process?uname` the browser will render
6406532578287. ✓ **Valid Username:**

For URL <http://127.0.0.1:5000/process?uname=101MU> the browser will render Bad Request: Numeric username provided
6406532578288. ✘

Question Number : 137 Question Id : 640653770837 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following flask application.

app.py

```
from flask import Flask, abort, request

app = Flask(__name__)
data = {'MAD-I':'CS2003', 'MAD-II':'CS2004', 'Java':'CS2005'}
@app.route('/course/<course_name>')
def course(course_name):
    course_id = request.args.get('id')
    if course_name in data and course_id == data[course_name]:
        return f'

# The Course ID for {course_name} is: {course_id}

'
    else:
        abort(400, "Bad Request: Invalid data")

app.run(debug=True)
```

Which of the following statements is/are true if the application is running locally on <http://127.0.0.1:5000> ?

Options :

For URL <http://127.0.0.1:5000/MAD-I?id=CS2003> the browser will render;
6406532578289. ✘ **The Course ID for MAD-I is: CS2003**

For URL <http://127.0.0.1:5000/course/Java?id=CS2005> the browser will render;
6406532578290. ✓ **The Course ID for Java is: CS2005**

For URL `http://127.0.0.1:5000/course?course_name=MAD-II&id=CS2004`
the browser will render;

6406532578291. ✘ The Course ID for MAD-II is: CS2004

For URL `http://127.0.0.1:5000/course/MAD-II?id=CS2003` the browser will render;

6406532578292. ✓ Bad Request: Invalid data

Sub-Section Number : 6

Sub-Section Id : 640653112714

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 138 Question Id : 640653770842 Question Type : MSQ Is Question

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

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the below schema:

Field	Description
emp_id	Integer and primary key
employee_name	String with maximum 255 length, mandatory field and can be duplicated
basic_salary	Real number is an optional field that can be duplicated

Which of the below is the correct syntax to create a data model using `flask_sqlalchemy`?

Options :

```
class Employee(db.Model):
    emp_id=db.Column(db.Integer, unique=True)
    employee_name=db.Column(db.String, nullable=False)
    basic_salary=db.Column(db.Float, nullable=True)
```

6406532578309. ✘

```
class Employee(db.Model):
    emp_id=db.Column(db.Integer, primary_key=True)
    employee_name=db.Column(db.String, nullable=True)
    basic_salary=db.Column(db.Float, nullable=False)
```

6406532578310. ❌

```
class Employee(db.Model):
    emp_id=db.Column(db.Integer, primary_key=True)
    employee_name=db.Column(db.String, nullable=False)
    basic_salary=db.Column(db.Float)
```

6406532578311. ✓

```
class Employee(db.Model):
    emp_id=db.Column(db.Integer, primary_key=True)
    employee_name=db.Column(db.String, nullable=False)
    basic_salary=db.Column(db.Float, nullable=True)
```

6406532578312. ✓

Question Number : 139 Question Id : 640653770847 Question Type : MSQ Is Question

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

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following HTML document and select the correct option(s).

```
<!DOCTYPE html>
<html>
<head>
    <title>Form Validation</title>
    <script>
        function validateForm() {
            var username = document.forms["myForm"]["username"].value;
            var password = document.forms["myForm"]["password"].value;
            if (username == "") {
                alert("Username must be filled out");
                return false;
            }
            if (password.length < 8) {
                alert("Password must be at least 8 characters long");
                return false;
            }
        }
    </script>
</head>
<body>
    <form name="myForm" onsubmit="validateForm()">
        <label for="username">Username:</label>
        <input type="text" name="username">
        <label for="password">Password:</label>
        <input type="password" name="password" required>
        <input type="submit" value="Submit">
    </form>
</body>
</html>
```

Options :

The JavaScript function, '**validateForm**' performs the backend processing of
6406532578329. ❌ form data.

The JavaScript function, '**validateForm**' carries out the client side validation of
6406532578330. ✓ form data.

If the password field is left empty, on submission, the user will get a prompt
6406532578331. ✓ "Please fill out this field." near the password field.

If the password field is left empty, on submission, the user will get a prompt "Password must be at least 8 characters long" from the browser.

6406532578332. ✖

Question Number : 140 Question Id : 640653770849 Question Type : MSQ Is Question

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

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following api resources created using flask_restful. Assume that the app is connected to the database and is running on one terminal. Select the correct option(s).

```
class TestApi(Resource):
    def get(self, admin):
        # retrieves admin data from database and returns it.
        return {
            "name": "mad1_admin",
            "role": "admin",
        }

    def post(self):
        # fetches user data from request body and stores in the
        # database.
        return {
            "message": "user added successfully"
        }, 201

api.add_resource(TestApi, "/api/<string:admin>", "/<admin>",
"/user_data", "/")

app.run()
```

Options :

6406532578337. ✖ The base URL for the app is mapped with GET HTTP method.

6406532578338. ✓

If we run the command: `curl http://127.0.0.1:5000/api/user -X GET` on a new terminal; it will return;

```
{  
  "name": "mad1_admin",  
  "role": "admin"  
}
```

6406532578339. ✓ The endpoint, /<admin> is mapped with GET HTTP method.

If we run the command: `curl http://127.0.0.1:5000/user-data -X POST` on a new terminal; it will return;

```
{  
  "message": "user added successfully"  
}
```

6406532578340. ✓

MLF

Section Id :	64065353280
Section Number :	9
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	40
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 :	640653112715
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 141 Question Id : 640653770850 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 : MACHINE LEARNING FOUNDATIONS (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 :

6406532578341. ✓ YES

6406532578342. ✘ NO

Sub-Section Number :	2
Sub-Section Id :	640653112716
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 142 Question Id : 640653770851 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider two complex matrices A and B such that both are the Hermitian matrices. Which of the following statements is/are true?

Options :

6406532578343. ✓ $A + B$ is also a Hermitian matrix.

6406532578344. ✓ $\overline{A + B}$ is a Hermitian matrix, where $\overline{A + B}$ is a conjugate of $A + B$.

6406532578345. ✗ AB is also a Hermitian matrix.

6406532578346. ✗ \overline{AB} is Hermitian matrix, where \overline{AB} is conjugate of AB .

Sub-Section Number : 3

Sub-Section Id : 640653112717

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770852 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 : (143 to 144)

Question Label : Comprehension

Consider a matrix $A = \begin{pmatrix} 1 & -i \\ i & 1 \end{pmatrix}$. Use this information to answer the given sub-questions.

Sub questions

Question Number : 143 Question Id : 640653770853 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true about A ?

Options :

6406532578347. ✓ A is the Hermitian matrix.

6406532578348. ✗ A is the Unitary matrix.

6406532578349. ✓ All eigenvalues are real.

6406532578350. ✗ Eigenvalues are complex.

Question Number : 144 Question Id : 640653770854 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true about A ?

Options :

$$A = \begin{pmatrix} \frac{-i\sqrt{2}}{2} & \frac{i\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix} \begin{pmatrix} 2 & 0 \\ 0 & 0 \end{pmatrix} \begin{pmatrix} \frac{-i\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{i\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$$

6406532578351. ✓

$$A^2 = \begin{pmatrix} \frac{-i\sqrt{2}}{2} & \frac{i\sqrt{2}}{2} \\ \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix} \begin{pmatrix} 4 & 0 \\ 0 & 0 \end{pmatrix} \begin{pmatrix} \frac{-i\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ \frac{i\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$$

6406532578352. ✓

6406532578353. ✓ $\begin{pmatrix} i \\ 1 \end{pmatrix}$ is an eigenvector of A

6406532578354.

✖ A is not diagonalizable.

Question Id : 640653770855 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 : (145 to 146)

Question Label : Comprehension

Consider a matrix $A = \begin{pmatrix} 2 & 1 \\ 1 & 0 \\ 0 & 1 \end{pmatrix}$. Let $A = Q_1 \sum Q_2^T$ be the SVD form of A .

Use this matrix to answer the given sub-questions.

Sub questions

Question Number : 145 Question Id : 640653770856 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is/are true?

Options :

6406532578355. ✖ $A^T A = \begin{pmatrix} 5 & 2 \\ 3 & 2 \end{pmatrix}$

6406532578356. ✖ Eigenvalues of $A^T A$ are 6 and 2.

6406532578357. ✓ An eigenvector of $A^T A$ corresponding to eigenvalue 6 is $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$

6406532578358. ✓

Orthonormalized eigenvectors of $A^T A$

are $\begin{pmatrix} \frac{2\sqrt{5}}{5} \\ \frac{\sqrt{5}}{5} \end{pmatrix}$ and $\begin{pmatrix} -\frac{\sqrt{5}}{5} \\ \frac{2\sqrt{5}}{5} \end{pmatrix}$

Question Number : 146 Question Id : 640653770857 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is/are true?

Options :

6406532578359. ✘ $\Sigma = \begin{pmatrix} \sqrt{6} & 0 \\ 0 & \sqrt{2} \\ 0 & 0 \end{pmatrix}$

6406532578360. ✓ $\Sigma = \begin{pmatrix} \sqrt{6} & 0 \\ 0 & 1 \\ 0 & 0 \end{pmatrix}$

6406532578361. ✓ $Q_2 = \begin{pmatrix} \frac{2\sqrt{5}}{5} & -\frac{\sqrt{5}}{5} \\ \frac{\sqrt{5}}{5} & \frac{2\sqrt{5}}{5} \end{pmatrix}$

6406532578362. ✘ $Q_2 = \begin{pmatrix} \frac{2\sqrt{5}}{5} & \frac{\sqrt{5}}{5} \\ \frac{\sqrt{5}}{5} & \frac{2\sqrt{5}}{5} \end{pmatrix}$

Sub-Section Number :	4
Sub-Section Id :	640653112718
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770858 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 : (147 to 148)

Question Label : Comprehension

Consider a quadratic function

$$f_1(x_1, x_2) = \begin{pmatrix} x_1 & x_2 \end{pmatrix} A \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = 2x_1^2 + 12x_1x_2 + 7x_2^2, \text{ where } A \text{ is a matrix.}$$

Use the above information to answer the given sub-questions.

Sub questions

Question Number : 147 Question Id : 640653770859 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

Which of the following options represents matrix A?

Options :

6406532578363. ✓ $A = \begin{pmatrix} 2 & 6 \\ 6 & 7 \end{pmatrix}$

6406532578364. ✗ $A = \begin{pmatrix} 2 & -6 \\ -6 & 7 \end{pmatrix}$

6406532578365. ✗ $A = \begin{pmatrix} -2 & 6 \\ 6 & -7 \end{pmatrix}$

$$A = \begin{pmatrix} -2 & -6 \\ -6 & -7 \end{pmatrix}$$

6406532578366. ✘

Question Number : 148 Question Id : 640653770860 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 options is/are true?

Options :

6406532578367. ✘ A is a negative definite matrix.

6406532578368. ✘ A is a positive definite matrix.

6406532578369. ✘ A is a negative semi-definite matrix.

6406532578370. ✘ A is a positive semi-definite matrix.

6406532578371. ✓ A is a indefinite matrix.

Sub-Section Number : 5

Sub-Section Id : 640653112719

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770861 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 : (149 to 151)

Question Label : Comprehension

Consider the following dataset:

$$\left\{ \begin{pmatrix} -1 \\ -1 \end{pmatrix}, \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \begin{pmatrix} 3 \\ 3 \end{pmatrix} \right\}$$

Suppose we want to project the above dataset onto a 1 dimensional space.

Based on the above data, answer the given subquestions

Sub questions

Question Number : 149 Question Id : 640653770862 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

Compute the sample covariance matrix C for the given dataset.

Options :

6406532578372. ✓ $C = \frac{1}{3} \begin{pmatrix} 8 & 8 \\ 8 & 8 \end{pmatrix}$

6406532578373. ✗ $C = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$

6406532578374. ✗ $C = \frac{1}{3} \begin{pmatrix} 10 & 10 \\ 10 & 10 \end{pmatrix}$

6406532578375. ✗ $C = \frac{1}{3} \begin{pmatrix} 11 & 11 \\ 11 & 11 \end{pmatrix}$

Question Number : 150 Question Id : 640653770863 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 is the principal direction that is chosen for performing PCA?

Options :

6406532578376. ✘ $\begin{pmatrix} -1/\sqrt{2} \\ 1/\sqrt{2} \end{pmatrix}$

6406532578377. ✓ $\begin{pmatrix} 1/\sqrt{2} \\ 1/\sqrt{2} \end{pmatrix}$

6406532578378. ✘ $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$

6406532578379. ✘ $\begin{pmatrix} 0 \\ 1 \end{pmatrix}$

Question Number : 151 Question Id : 640653770864 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

If \tilde{x}_1, \tilde{x}_2 and \tilde{x}_3 are the projections of the data points onto the first principal component, then which among the following are true?

Options :

6406532578380. ✘ $\tilde{x}_1 = \begin{pmatrix} -1 \\ 1 \end{pmatrix}, \tilde{x}_2 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \tilde{x}_3 = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$

6406532578381. ✘ $\tilde{x}_1 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \tilde{x}_2 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \tilde{x}_3 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$

6406532578382. ❌ $\tilde{x}_1 = \begin{pmatrix} -1/2 \\ 1/2 \end{pmatrix}, \tilde{x}_2 = \begin{pmatrix} 1/2 \\ 1/2 \end{pmatrix}, \tilde{x}_3 = \begin{pmatrix} 3/2 \\ 1/2 \end{pmatrix}$

6406532578383. ✓ $\tilde{x}_1 = \begin{pmatrix} -1 \\ -1 \end{pmatrix}, \tilde{x}_2 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \tilde{x}_3 = \begin{pmatrix} 3 \\ 3 \end{pmatrix}$

Sub-Section Number : 6

Sub-Section Id : 640653112720

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 152 Question Id : 640653770865 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

Which of the following statements is true about the matrix $A = \begin{pmatrix} 3 & 2 \\ -2 & -1 \end{pmatrix}$?

Options :

6406532578384. ✓ A is positive definite.

6406532578385. ❌ A is positive semi-definite.

6406532578386. ❌ A is negative definite.

6406532578387. ❌ A is negative semi-definite.

Sub-Section Number : 7

Sub-Section Id : 640653112721

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 153 Question Id : 640653770866 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 a function $f(x, y) = x^2 - 4x + 2y + 1$. Using gradient descent algorithm, with an initial guess of $(3, 2)$ and learning rate of $\frac{1}{t+1}$, where $t = 1, 2, 3, \dots$. What will be the value of (x, y) after two iterations?

Options :

6406532578388. ✘ $x = 0.5, y = 0$

6406532578389. ✘ $x = 2.512, y = 1.612$

6406532578390. ✘ $x = 0, y = 0$

6406532578391. ✓ $x = 2, y = 0.33$

Question Number : 154 Question Id : 640653770867 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

Find the point(s) on the circle $y^2 = 4 + x^2$ closest to the point $(3, 0)$.

Options :

6406532578392. ✘ -1.5, -2.5

6406532578393. ✓ 1.5, 2.5

6406532578394. ✘ 1.5, -2.5

6406532578395. ✘ -1.5, 2.5

Sub-Section Number :	8
Sub-Section Id :	640653112722
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 155 Question Id : 640653770868 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

The value of a function at point 5 is 10. The values of the function's first and second order derivatives at this point are 5 and 2 respectively. What will be the function's approximate value at the point 5.1? (Enter the answer correct up to two decimal places).

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

10.2 to 10.8

Java

Section Id :	64065353281
Section Number :	10
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
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 :	640653112723
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 156 Question Id : 640653770869 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

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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 :

6406532578397. ✓ YES

6406532578398. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653112724
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 157 Question Id : 640653770870 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the Java code given below.

The method `boolean containsKey (Object key)` in the class `Map` returns `true` if and only if the map contains a mapping for a key `k` such that `Objects.equals(key, k)`.

```
import java.util.*;
interface Shape {
    void draw();
}
class Circle implements Shape {
    public void draw() {
        System.out.println("Drawing a Circle");
    }
}
class Square implements Shape {
    public void draw() {
        System.out.println("Drawing a Square");
    }
}
class DrawingBoard<T extends Shape> {
    private Map<String, T> m = new HashMap<>();// LINE 1
    public void add(String name, T shape) {
        m.put(name, shape);
    }
    public void draw(String name) {
        if (m.containsKey(name)) {
            T s = m.get(name); //LINE 2
            s.draw();
        } else {
            System.out.println("Shape not found");
        }
    }
}
public class Test {
    public static void main(String[] args) {
        DrawingBoard<Shape> dB = new DrawingBoard<Shape>();
        Shape s1 = new Circle();
        Shape s2 = new Square();
        dB.add("circle", s1);
        dB.add("square", s2);
        dB.draw("circle");
        dB.draw("triangle");
    }
}
```

Choose the correct option.

Options :

6406532578399. ❌ LINE 1 generates compilation error because type T is not known

This program generates output:

6406532578400. ❌ Drawing a Circle

LINE 2 generates compilation error because a variable of type Shape cannot

6406532578401. ❌ refer to objects of type Circle and Square

This program generates output:

Drawing a Circle

Shape not found

6406532578402. ✓

Question Number : 158 Question Id : 640653770876 Question Type : MCQ Is Question

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

Correct Marks : 6

Question Label : Multiple Choice Question

Consider two Java files located in two different packages as shown below.

A.java:

```
package com.pack1;
public class A {
    void methodOne() {
        System.out.println("Display methodOne");
    }
    private void methodTwo() {
        System.out.println("Display methodTwo");
    }
    protected void methodThree() {
        System.out.println("Display methodThree");
    }
    public void methodFour() {
        System.out.println("Display methodFour");
    }
}
```

B.java

```
package com.pack2;
import com.pack1.A;
public class B extends A {
    public static void main(String[] args) {
        B obj = new B();
        obj.methodOne();      //LINE 1
        obj.methodTwo();     //LINE 2
        obj.methodThree();   //LINE 3
        obj.methodFour();    //LINE 4
    }
}
```

Choose the correct option.

Options :

6406532578423. ✘ LINE 2 and LINE 3 generate compilation errors.

6406532578424. ✘ LINE 1, LINE 2, and LINE 3 generate compilation errors.

6406532578425. ✓ LINE 1 and LINE 2 generate compilation errors.

6406532578426. ❁ Only LINE 2 generates a compilation error.

Question Number : 159 Question Id : 640653770877 Question Type : MCQ Is Question

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

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Validation {  
    public boolean validate(int a, int b) {  
        assert a > 0: "a should be greater than zero"; //LINE 1  
        assert b >= 1: "b should not be less than one"; //LINE 2  
        return true;  
    }  
}  
public class AssertTest {  
    public static void main(String[] args) {  
        int a = 1;  
        int b = -1;  
        int result = 0;  
        Validation obj = new Validation();  
        if (obj.validate(a, b))  
            result = a / b;  
        assert result > 0: "result should be greater than zero"; //LINE 3  
        System.out.println(result);  
    }  
}
```

Choose the correct option when the program is executed as:

java -ea AssertTest

Options :

6406532578427. ❁ LINE 1 generates assertion error.

6406532578428. ✓ LINE 2 generates assertion error.

6406532578429. ❌ LINE 3 generates assertion error.

6406532578430. ❌ This program does not generate assertion error.

Question Number : 160 Question Id : 640653770879 Question Type : MCQ Is Question

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

Correct Marks : 6

Question Label : Multiple Choice Question

The following code maps a set of names of employees to their performance ratings, and groups the names based on their eligibility for bonus. Based on the code, answer the question that follows.

```
import java.util.*;
public class Employee {
    TreeSet<String> t1 = new TreeSet<String>();
    TreeSet<String> t2 = new TreeSet<String>();
    public boolean PerformanceRating(double rating) {
        if(rating >= 4.0){
            return true;
        }
        return false;
    }
    public void filterEmployees(TreeMap<String, Double> rating) {
        for (Map.Entry<String, Double> entry : rating.entrySet()) {
            if (PerformanceRating(entry.getValue())) {
                t1.add(entry.getKey());
            } else {
                t2.add(entry.getKey());
            }
        }
    }
    public void display() {
        System.out.println("Eligible for Bonus: " + t1);
        System.out.println("Not Eligible for Bonus: " + t2);
    }
    public static void main(String[] args) {
        TreeMap<String, Double> rating = new TreeMap<String, Double>();
        rating.put("Ramesh", 4.5);
        rating.put("Suresh", 3.8);
        rating.put("Kartik", 4.2);
        rating.put("Shubham", 3.5);
        rating.put("Mukesh", 4.8);
        Employee e = new Employee();
        e.filterEmployees(rating);
        e.display();
    }
}
```

Choose the correct option.

Options :

This program generates the output:

Eligible for Bonus: [Shubham, Suresh]

Not Eligible for Bonus: [Mukesh, Ramesh, Kartik]

6406532578435. ✘

6406532578436. ✓

This program generates the output:

Eligible for Bonus: [Kartik, Mukesh, Ramesh]

Not Eligible for Bonus: [Shubham, Suresh]

This program generates the output:

Eligible for Bonus: [Mukesh, Ramesh, Kartik]

Not Eligible for Bonus: [Shubham]

6406532578437. *

6406532578438. * The order in which elements of t1 and t2 are printed cannot be predicted.

Question Number : 161 Question Id : 640653770880 Question Type : MCQ Is Question

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

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the following code.

```
import java.util.*;
public class Test {
    public static void main(String[] args) {
        List<Integer> scores1 = new ArrayList<>();
        scores1.add(34);
        scores1.add(42);
        scores1.add(50);

        List<Integer> scores2 = new ArrayList<>();
        scores2.add(45);
        scores2.add(90);
        scores2.add(34);

        Map<String, Integer> am = new HashMap<>();
        Map<String, List<Integer>> hm = new HashMap<>();
        hm.put("Anil", scores1);
        hm.put("Vikas", scores2);
        Set<String> names = hm.keySet();
        for(String name : names){
            List<Integer> temp = hm.get(name);
            int count = 0;
            int sum = 0;
            ****-----***  
            CODE BLOCK  
            ****-----***  
            int avg = sum/count;
            am.put(name, avg);
        }
    }
}
```

Choose the correct option to fill in the CODE BLOCK to add the name and the average scores of both the students as map entries in `Map<String, Integer> am`.

Options :

```
for(List i : temp){
    count = count + 1;
    sum = sum + i;
```

6406532578439. ✘ }

6406532578440. ✘

```
for(List<Integer> i : temp){  
    count = count + 1;  
    sum = sum + i;  
}
```

```
        for(int i: temp){  
            sum = sum + temp;  
            count = count + 1;
```

6406532578441. ✘ }

```
for(Integer i : temp){  
    count = count + 1;  
    sum = sum + i;
```

6406532578442. ✓ }

Question Number : 162 Question Id : 640653770881 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the Java code given below that checks whether the input word is a palindrome or not.

```
import java.util.*;
public class PalindromeChecker {
    public static boolean isPalindrome(String word) {
        Deque<Character> deque = new ArrayDeque<>();
        for (int i = 0; i < word.length(); i++) {
            deque.add(word.charAt(i));
        }
        //CODE BLOCK
        return true;
    }
    public static void main(String[] args) {
        String word1 = "radar";
        String word2 = "hello";
        System.out.println("Is '" + word1 + "' a palindrome? " +
                           isPalindrome(word1));
        System.out.println("Is '" + word2 + "' a palindrome? " +
                           isPalindrome(word2));
    }
}
```

Choose the correct option(s) to fill in place of CODE BLOCK so that the output is:

Is 'radar' a palindrome? true
Is 'hello' a palindrome? false

Please note the following methods from type Deque.

`pollLast()`: Retrieves and removes the last element of this deque, or returns null if this deque is empty.

`pollFirst()`: Retrieves and removes the first element of the deque, or returns null if the deque is empty.

Options :

```
while (deque.size() > 0) {
    if (deque.pollFirst() != deque.pollLast()) {
        return true;
    }
}
```

6406532578443. *

6406532578444. *

```
while (deque.size() < 0) {  
    if (deque.pollFirst() != deque.pollLast()) {  
        return false;  
    }  
}
```

```
    while (deque.size() > 1) {  
        if (deque.pollFirst() != deque.pollLast()) {  
            return false;  
        }  
    }
```

6406532578445. ✓

```
while (deque.size() > 0) {  
    char first = deque.pollFirst();  
    char last = deque.pollLast();  
    if (first != last) {  
        return true;  
    }
```

6406532578446. ✘

Question Number : 163 Question Id : 640653770882 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Student implements Cloneable {  
    String studentName;  
    public Student(String n) {  
        studentName = n;  
    }  
    public Student clone() throws CloneNotSupportedException {  
        return (Student) super.clone();  
    }  
}  
class Game implements Cloneable {  
    String gameName;  
    Student student1;  
    Student student2;  
    public Game(String gN, Student s1, Student s2) {  
        gameName = gN;  
        student1 = s1;  
        student2 = s2;  
    }  
    public Game clone() throws CloneNotSupportedException {  
        Game g = (Game) super.clone();  
        g.student1 = g.student1.clone();  
        g.student2 = g.student2.clone();  
        return g;  
    }  
}  
public class Test {  
    public static void main(String[] args) throws CloneNotSupportedException {  
        Student s1 = new Student("Ramesh");  
        Student s2 = new Student("Jogesh");  
        Game obj1 = new Game("ABC", s1, s2);  
        Game obj2 = obj1.clone();  
        obj2.student1.studentName = "Shubham";  
        obj2.gameName = "XYZ";  
        System.out.println(obj1.gameName + " : " + obj1.student1.studentName);  
        System.out.println(obj2.gameName + " : " + obj2.student1.studentName);  
    }  
}
```

What will the output be?

Options :

ABC : Shubham
ABC : Shubham

6406532578447. *

XYZ : Shubham
XYZ : Shubham

6406532578448. *

ABC : Ramesh
6406532578449. ✓ XYZ : Shubham

ABC : Shubham
6406532578450. ✗ XYZ : Shubham

Question Number : 164 Question Id : 640653770883 Question Type : MCQ Is Question

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

Correct Marks : 6

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.util.*;
import java.util.stream.*;
public class MyClass {
    public static void main(String args[]) {
        List<String> wordlist = new ArrayList<>();
        wordlist.add("reluctant");
        wordlist.add("test");
        wordlist.add("unpleasant");
        wordlist.add("delicious");
        wordlist.add("away");
        Stream<String> startLongWords = wordlist.stream()
            .filter(w -> w.length() > 5)
            .map(s -> s.substring(0, 2));
        startLongWords.forEach(System.out::println);
    }
}
```

What will the output be?

Options :

6406532578451. ✗

re
te
un
de
aw

te

6406532578452. ✘ aw

re

un

6406532578453. ✓ de

reluctant

unpleasant

6406532578454. ✘ delicious

Sub-Section Number :

3

Sub-Section Id :

640653112725

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 165 Question Id : 640653770872 Question Type : MCQ Is Question

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

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below.

```
interface Chargeable {  
    void charge();  
}  
class SmartPhone implements Chargeable {  
    public void charge() {  
        System.out.println("Charging SmartPhone");  
    }  
}  
class SmartWatch implements Chargeable {  
    public void charge() {  
        System.out.println("Charging SmartWatch");  
    }  
}  
class DeviceList {  
    private Object[] cArr = {new SmartPhone(), new SmartWatch()};  
    public void chargeDevices() {  
        for (int i = 0; i < cArr.length; i++) {  
            // LINE 1  
        }  
    }  
}  
public class Test {  
    public static void main(String[] args) {  
        DeviceList dList = new DeviceList();  
        dList.chargeDevices();  
    }  
}
```

Identify the appropriate option to fill in place of LINE 1 such that the output is:

Charging SmartPhone

Charging SmartWatch

Options :

6406532578407. ❌ cArr[i].charge();

6406532578408. ✓ ((Chargeable)cArr[i]).charge();

6406532578409. ❌ ((SmartPhone)cArr[i]).charge();

6406532578410. * ((SmartWatch)cArr[i]).charge();

Question Number : 166 Question Id : 640653770873 Question Type : MCQ Is Question

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

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below.

```
public class ArrayUtils{
    public <T extends Comparable> T max(T[] arr){
        // code for finding maximum here
    }
    public <T extends Number> T avg(T[] arr){
        // code for finding average of elements here
    }
    public <T> int count(T[] arr){
        // code for counting the number of elements in array
    }
}
```

How does class `ArrayUtils` look after type erasure?

Options :

```
public class ArrayUtils{
    public Object max(Object[] arr){
        // code for finding maximum here
    }
    public Number avg(Number[] arr){
        // code for finding average of elements here
    }
    public int count(Object[] arr){
        // code for counting the number of elements in array
    }
}
```

6406532578411. *

6406532578412. *

```
public class ArrayUtils{
    public Object max(Object[] arr){
        // code for finding maximum here
    }
    public Object avg(Object[] arr){
        // code for finding average of elements here
    }
    public int count(Object[] arr){
        // code for counting the number of elements in array
    }
}
```

```
public class ArrayUtils{
    public Comparable max(Comparable[] arr){
        // code for finding maximum here
    }
    public Number avg(Number[] arr){
        // code for finding average of elements here
    }
    public int count(Object[] arr){
        // code for counting the number of elements in array
    }
}
```

6406532578413. ✓

```
public class ArrayUtils{
    public Comparable max(Comparable[] arr){
        // code for finding maximum here
    }
    public Integer avg(Integer[] arr){
        // code for finding average of elements here
    }
    public int count(Object[] arr){
        // code for counting the number of elements in array
    }
}
```

6406532578414. *

Question Number : 167 Question Id : 640653770875 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class MinimumMarksException extends Exception {  
    public MinimumMarksException(String message) {  
        super(message);  
    }  
}  
class Student {  
    private double marks;  
    private final double MINIMUM_MARKS = 40.0;  
    // Constructor to initialize the marks  
    public void checkResult() throws MinimumMarksException {  
        if (marks < MINIMUM_MARKS) {  
            throw new MinimumMarksException("Minimum marks not scored");  
        }  
        else {  
            System.out.println("Scored sufficient marks");  
        }  
    }  
}  
public class Test {  
    public static void main(String[] args) {  
        Student s1 = new Student(55.0);  
        Student s2 = new Student(30.0);  
        try {  
            s1.checkResult();  
            s2.checkResult();  
        } catch (MinimumMarksException e) {  
            System.out.println("Error: " + e.getMessage());  
        }  
    }  
}
```

Choose the correct option.

Options :

This program generates the output:

Scored sufficient marks

6406532578419. ✓ Error: Minimum marks not scored

This program generates the output:

Scored sufficient marks

MinimumMarksException

6406532578420. *

This program generates the output:

Scored sufficient marks

6406532578421. *

Minimum marks not scored

This program generates the output:

Error: MinimumMarksException

6406532578422. *

Question Number : 168 Question Id : 640653770878 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 7

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.util.*;
class Contestant{
    String name;
    int points;
    //constructor to initialize name and points
    public String toString() {
        return name;
    }
}
public class IteratorTest {
    public static boolean ranked(int x) {
        if(x < 5)
            return false;
        return true;
    }
    public static void getFinalList(List<Contestant> cList){
        Iterator<Contestant> it = cList.iterator();
        while (it.hasNext()) {
            Contestant c = it.next();
            if(!ranked(c.points))
                ----- //LINE 1
        }
    }
    public static void main(String[] args) {
        var list = new ArrayList<Contestant>();
        list.add(new Contestant("Sanju", 7));
        list.add(new Contestant("Kiran", 4));
        list.add(new Contestant("Ram", 5));
        list.add(new Contestant("John", 5));
        getFinalList(list);
        System.out.println(list);
    }
}
```

Choose the correct option to be filled in place of LINE 1 so that the output is:
[Sanju, Ram, John]

Options :

6406532578431. ✘ `it.remove(c)`

6406532578432. ✓ `it.remove()`

6406532578433.

* cList.remove()

6406532578434. * cList.remove(c)

Sub-Section Number : 4

Sub-Section Id : 640653112726

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 169 Question Id : 640653770871 Question Type : MSQ Is Question

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

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the Java code given below.

```
public interface Animal{
    public abstract void makeSound();
}

public class Zoo{
    private String category;
    public void setCategory(String s) {
        this.category = s;
    }
    public String getCategory() {
        return category;
    }
    public Animal createAnimal(){
        if(getCategory() == "Mammal"){
            return new Mammal();
        }
        return new Bird();
    }
}
private class Mammal implements Animal{
    public void makeSound(){
        System.out.println("Mammal making a sound");
    }
}
private class Bird implements Animal {
    public void makeSound() {
        System.out.println("Bird chirping");
    }
}
}

public class Example {
    public static void main(String[] args) {
        Zoo z = new Zoo();
        z.setCategory("Mammal");
        // ----- Line 1 -----
    }
}
```

Identify the appropriate option to fill in place of LINE 1 such that the output is:
Mammal making a sound

Options :

6406532578403. ✘ z.makeSound();

6406532578404. ✓ z.createAnimal().makeSound();

6406532578405.

✓ ((Animal) z.createAnimal()).makeSound();

Animal a = z.createAnimal();
6406532578406. ✓ a.makeSound();

Question Number : 170 Question Id : 640653770874 Question Type : MSQ Is Question

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

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the Java code given below that prints the highest goals among a set of given GoalScorer objects. From among the options, identify the appropriate function header for the function printHighestGoals that takes as input an array of GoalScorer objects and prints the highest goal.

```
import java.util.*;
interface GoalScorer {
    public abstract int getGoals();
}
public class Player implements GoalScorer {
    private double goals;
    // Constructor
    // method getGoals() that returns goals
}
public class Test {
    // LINE 1: FUNCTION HEADER
    {
        // invokes method getGoals()
        // to print the value of highest goals
    }
    public static void main(String[] args) {
        GoalScorer[] players = {new Player(123), new Player(98), new Player(79)};
        printHighestGoals(players);
    }
}
```

Choose the correct option(s).

Options :

6406532578415. ❌ public static void printHighestGoals(<?> players)

6406532578416. ✓ public static <T extends GoalScorer> void printHighestGoals(T[] players)

6406532578417. ❌ public static <T extends Player> void printHighestGoals(T[] players)

6406532578418. ✓ public static void printHighestGoals(GoalScorer[] players)

Question Number : 171 Question Id : 640653770884 Question Type : MSQ Is Question

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

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the Java code given below that should print the names of students whose gpa is between 3.0 and 3.8 (both inclusive).

```
import java.util.*;
class Student {
    String name;
    double gpa;
    public Student(String n, double g) {
        name = n;
        gpa = g;
    }
}
public class StreamExample {
    public static void main(String[] args) {
        List<Student> students = new ArrayList<>();
        students.add(new Student("Alice", 3.5));
        students.add(new Student("Bob", 3.2));
        students.add(new Student("Charlie", 3.8));
        students.add(new Student("David", 3.0));
        students.add(new Student("Eva", 4.0));
        //CODE BLOCK
    }
}
```

Choose the correct option(s) to fill in place of CODE BLOCK to obtain the right answer.

Options :

6406532578455. ❌
students.stream()
 .map(s -> s.gpa >= 3.0 && s.gpa <= 3.8)
 .forEach(s -> System.out.println(s.name));

6406532578456. ✓
students.stream()
 .filter(s -> s.gpa >= 3.0 && s.gpa <= 3.8)
 .forEach(s -> System.out.println(s.name));

6406532578457. ✓
students.stream()
 .filter(s -> s.gpa >= 3.0)
 .filter(s -> s.gpa <= 3.8)
 .forEach(s -> System.out.println(s.name));

6406532578458. ❌

```
students.stream()
    .filter(s -> s.gpa >= 3.0)
    .map(s -> s.gpa <= 3.8)
    .foreach(s -> System.out.println(s.name));
```

AppDev2

Section Id :	64065353282
Section Number :	11
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
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 :	640653112727
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 172 Question Id : 640653770885 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 II (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 :

6406532578459. ✓ YES

6406532578460. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653112728

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 173 Question Id : 640653770886 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 below javascript program.

```
var first = 30
const obj1 = {
    first: 50,
    second: () => {
        console.log("Value:", this.first);
    }
}

const obj2 = {
    first: 80,
    second: function () {
        console.log("Value:", this.first);
        this.second();
    }
}

obj2.second.call(obj1);
```

What will be the output of the program, if executed in a REPL environment?

Options :

Value: 80
6406532578461. ✘ Value: 50

Value: 80
6406532578462. ✘ Value: 30

Value: 50
6406532578463. ✘ Value: 50

Value: 50
6406532578464. ✓ Value: 30

Value: 30
6406532578465. ✘ Value: 30

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 below JavaScript code.

```
function isValidAge(age) {
    return !(age > 18)
}

const validAgeParams = {
    voter_id: 123,
    constituency: 'New Delhi'
}

const teenageParams = {
    age_criteria: '<18',
}

let some_value;

console.log(
    isValidAge(some_value) ? {
        'name': 'ABC',
        ...(!isValidAge(19) && validAgeParams)
    } : {
        'name': 'XYZ',
        ...isValidAge(19) && teenageParams
    }
);
```

What will be the output of the above program, assuming the value of the variable "some_value" is less than 18?

Options :

```
{
    name: 'ABC'
}
```

6406532578466. ✘

6406532578467. ✓

```
{  
  name: 'ABC',  
  voter_id: 123,  
  constituency: 'New Delhi'  
}
```

```
{  
  name: 'XYZ'  
}
```

6406532578468. *

```
{  
  name: 'ABC',  
  age_criteria: '<18'  
}
```

6406532578469. *

Question Number : 175 Question Id : 640653770888 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 below JavaScript program.

```

const promise1 = new Promise((resolve, reject) => {
    setTimeout(() => {
        resolve('First promise resolved');
    }, 1000);
});

promise1
    .then((result) => {
        console.log(result);
        return new Promise((resolve, reject) => {
            setTimeout(() => {
                resolve('Second promise resolved');
            }, 3000);
        });
    })
    .then((result) => {
        console.log(result);
        return new Promise((resolve, reject) => {
            setTimeout(() => {
                reject('Third promise resolved');
            }, 3000);
        });
    })
    .then((result) => {
        console.log(result);
    })
    .catch((error) => {
        console.log("Promise chain interrupted. Reason:", error);
    });

```

What will be the output of the above program, if executed?

Options :

- First promise resolved
 - Second promise resolved
 - 6406532578470. ❗ Third promise Resolved
-
- 6406532578471. ❗ The program will crash without showing any output
-
- First promise resolved
 - Second promise resolved
 - Promise chain interrupted. Reason: Third promise resolved

First promise resolved
Second promise resolved
Promise chain interrupted. Reason: Third promise resolved
6406532578473. ✘ Third promise Resolved

First promise resolved
6406532578474. ✘ Second promise resolved

Question Number : 176 Question Id : 640653770895 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 Script embedded in an HTML document.

```
let Obj1 = {model:'AIR101', brand:'AIRBUS', type: 'Passenger'}  
let Obj2 = {__proto__: Obj1, wheels: '36', engines: 4}  
  
console.log(Obj2.model)  
console.log(Object.keys(Obj2).length)  
console.log(Obj1.engines)
```

What will be the output on console, if the HTML document is rendered using a browser?

Options :

6406532578503. ✓

AIR101
2
undefined

6406532578504. ✘

undefined
2
4

AIR101
5
undefined

6406532578505. *

AIR101
undefined
undefined

6406532578506. *

Question Number : 177 Question Id : 640653770898 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

Fill in `property_name` & `definition`, which can be used in Vuex Store to update the "best_food" state variable with the objects of those food items which have their calorific value less than 300.

```
const store = new Vuex.Store({
  state:{
    foods:[
      {"name":"Sandwich", "calories":100},
      {"name":"Pizza", "calories": 1250},
      {"name":"Chips", "calories": 700}
    ],
    best_food: []
  },
  =property_name=:{
    get_best_food: function(state) {
      ===== definition =====
    }
  },
})
```

Options :

```
property_name : actions,  
definition:  
state.foods.forEach(food => {  
    if (food.calories < 300){  
        context.best_food.push(food)  
    }  
});
```

6406532578515. ✖

```
property_name : actions,  
definition:  
state.foods.forEach(food => {  
    if (food.calories < 300){  
        state.best_food.push(food)  
    }  
});
```

6406532578516. ✖

```
property_name : mutations,  
definition:  
state.foods.forEach(food => {  
    if (food.calories < 300){  
        context.best_food.push(element)  
    }  
});
```

6406532578517. ✖

```
property_name : mutations,  
definition:  
state.foods.forEach(food => {  
    if (food.calories < 300){  
        state.best_food.push(element)  
    }  
});
```

6406532578518. ✓

Sub-Section Number :	3
Sub-Section Id :	640653112729
Question Shuffling Allowed :	Yes

Is Section Default? :

null

Question Number : 178 Question Id : 640653770896 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

Consider the following JavaScript code snippet.

```
// Code Snippet 1
sessionStorage.setItem('username', 'course_user');
let storedUsername = sessionStorage.getItem('username');

// Code Snippet 2
sessionStorage.removeItem('username');
let removedUsername = sessionStorage.getItem('username');

// Code Snippet 3
sessionStorage.clear();
let clearedStorage = sessionStorage.username;
```

What will be the values of 'storedUsername', 'removedUsername', and 'clearedStorage' after the execution of the above code snippets?

Options :

6406532578507. ❌ storedUsername: 'course_user', removedUsername: null, clearedStorage: null

6406532578508. ✓ storedUsername: 'course_user', removedUsername: null, clearedStorage: undefined

6406532578509. ❌ storedUsername: 'course_user', removedUsername: undefined, clearedStorage: null

6406532578510. ❌ storedUsername: 'course_user', removedUsername: undefined, clearedStorage: undefined

Sub-Section Number :	4
Sub-Section Id :	640653112730
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 179 Question Id : 640653770889 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the below JavaScript program.

```
const promise1 = new Promise((resolve, reject) => {
    setTimeout(() => {
        resolve('First promise resolved');
    }, 1000);
});

promise1
    .then((result) => {
        console.log(result);
        return new Promise((resolve, reject) => {
            setTimeout(() => {
                resolve('Second promise resolved');
            }, 3000);
        });
    })
    .then((result) => {
        console.log(result);
        return new Promise((resolve, reject) => {
            setTimeout(() => {
                resolve('Third promise resolved');
            }, 3000);
        });
    })
    .then((result) => {
        console.log(result);
    })
    .catch((error) => {
        console.log("Promise chain interrupted. Reason:", error);
});
```

Considering the asynchronous nature of promises in the above JavaScript program, what is the minimum time (in seconds) it will take for the entire execution to complete?

Options :

6406532578475. ✘ The program will never end

6406532578476. ✘ 0 second

6406532578477. ✘ 1 second

6406532578478. ✓ 7 seconds

6406532578479. ✘ 9 seconds

Question Number : 180 Question Id : 640653770901 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following Vue application with markup “index.html” and JavaScript file “app.js”.

index.html:

```
<div id = "app">
    <input v-model = "course" @input = "do_something">
    <p> {{role}} </p>
</div>
```

app.js:

```
new Vue({
    el : "#app",
    data : {
        course : "#app",
        role : "user",
    },
    mounted () {
        try {
            this.course = localStorage.getItem("course").split(" ")[0];
            this.role = localStorage.getItem("course").split(" ")[1];
            localStorage.setItem("course",
                localStorage.getItem("course").split(" ")[0] + " " +
this.course);
        }
        catch {
            this.course = "MAD_II";
            this.role = "admin";
        }
    },
    methods : {
        do_something() {
            localStorage.setItem("course", this.course);
            localStorage.setItem("role", this.role);
        }
    }
})
```

Suppose you open “index.html” file in a browser, and type the text “App Dev” in the text box shown (after removing the previous text, if any), and hard refresh the page twice, without clicking anywhere. What will be the value shown in the text box, and the “age” placeholder, respectively?

Options :

6406532578527. ✘ MAD_II, admin

6406532578528. ✘ App, Dev

6406532578529. ✓ App, App

6406532578530. ✗ Dev, App

Sub-Section Number :	5
Sub-Section Id :	640653112731
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 181 Question Id : 640653770890 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statement(s) is/are correct regarding web storage APIs?

Options :

6406532578480. ✓ Web Storage APIs provide a way to store key-value pairs persistently on the client side.

6406532578481. ✓ Web Storage APIs include “localStorage” and “sessionStorage”.

6406532578482. ✗ Data stored in “localStorage” is automatically cleared when the browser session ends.

6406532578483. ✗ The “sessionStorage” allows data to persist across browser sessions.

Question Number : 182 Question Id : 640653770892 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is a valid function signature for an action function in Vuex?

Options :

6406532578488. ✓ `async actionFunction (context) {}`

6406532578489. ✓ `async actionFunction ({ state, commit }, payload) {}`

6406532578490. ✗ `async actionFunction (context, payload1, payload2) {}`

6406532578491. ✗ `async actionFunction ({ context, commit }) {}`

Question Number : 183 Question Id : 640653770894 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select the statements that incorrectly describe characteristics or practices related to RESTful APIs.

Options :

6406532578498. ✗ Stateless communication

6406532578499. ✓ Use of SOAP for data exchange

6406532578500. ✗ Emphasis on nouns (resources) in URIs

6406532578501. ✓ Strict requirement for XML as the data format

6406532578502. ✗ Utilization of standard HTTP methods

Sub-Section Number : 6

Sub-Section Id : 640653112732

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 184 Question Id : 640653770893 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statement(s) is/are true regarding Single Page Applications (SPA) and Progressive Web Apps (PWA)?

Options :

6406532578492. ❌ SPAs load entire web pages from the server for each user interaction.

6406532578493. ✓ PWAs can be installed on a user's device and accessed from the home screen.

6406532578494. ✓ SPAs often rely on client-side routing to update the content dynamically.

6406532578495. ❌ PWAs always require an internet connection to function.

6406532578496. ✓ SPAs may result in faster user experiences as they avoid full-page reloads.

6406532578497. ✓ PWAs use service workers to enable offline capabilities.

Question Number : 185 Question Id : 640653770897 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Identify the correct statement(s) about the behavior of promise chains in JavaScript.

Options :

6406532578511. ❌ A "finally" block always comes at the end of the promise chain.

6406532578512. ❌ Every "catch" block must always be preceded by a "then" block.

6406532578513. ✓ A promise chain may consist of a number of "then" blocks.

6406532578514. ✓ The "finally" block always gets executed, irrespective of the promise outcome.

Question Number : 186 Question Id : 640653770899 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the below Vue class binding.

Script.js:

```
var app = new Vue({
  el: '#app',
  data : {
    classObj : {
      is_active: true,
      completed: false
    },
    myClass: 'is_active',
    status: true
  }
})
```

Code 1:

```
<div :class="classObj"></div>
```

Code 2:

```
<div :class="[status ? myClass : '' ]"></div>
```

Which of the following statements is/are true, assuming both code 1 and code 2 are part of app object?

Options :

6406532578519. ✓ The code snippet 1 will render the div element with class “completed”, if the “completed” property of “classObj” is set to true.

6406532578520. ✗ The code snippet 2 will render the div element with class “completed”, if the data variable “status” is set to true.

6406532578521. ✓ Both the code snippets will render same HTML

6406532578522. * Both the code snippets will render different HTML

Sub-Section Number :	7
Sub-Section Id :	640653112733
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 187 Question Id : 640653770891 Question Type : MSQ Is Question

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

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the below Vue component template and script definitions that use Vue router.

Template:

```
<template>
  <div>
    <h1>{{ pageTitle }}</h1>
    <router-link to="/home" v-if="showHomeLink">Home</router-link>
    <router-link to="/about" v-if="showAboutLink">About</router-link>
    <router-view></router-view>
  </div>
</template>
```

Script:

```
<script>
export default {
  name: 'App',
  data() {
    return {
      pageTitle: 'Vue Router Demo',
      showHomeLink: true,
      showAboutLink: false,
    };
  },
  watch: {
    '$route.path'() {
      if (this.$route.path === '/home') {
        this.showAboutLink = true;
        this.showHomeLink = false;
        this.pageTitle = 'Home Page';
      } else if (this.$route.path === '/about') {
        this.showAboutLink = false;
        this.showHomeLink = true;
        this.pageTitle = 'About Page';
      } else {
        this.pageTitle = 'Vue Router Demo';
      }
    },
  },
}
</script>
```

Assuming that the corresponding routes are properly configured, what does this component structure accomplish?

Options :

It displays a web page with a heading title "Vue Router Demo" and two navigation links to "Home" and "About."
6406532578484. ❌

It dynamically updates the heading title based on the route and conditionally shows navigation links to "Home" and "About."
6406532578485. ✓

6406532578486. ✗ It has a bug and will throw a runtime error.

The heading title is populated with the value "Vue Router Demo" when the user opens the app for the first time.
6406532578487. ✓

Question Number : 188 Question Id : 640653770900 Question Type : MSQ Is Question

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

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the below application with markup "index.html" and JavaScript file "app.js".

Filename: index.html

```
<body>
  <div id="app"></div>
  <script src="https://cdn.jsdelivr.net/npm/vue@2/dist/vue.js"></script>
  <script src="https://unpkg.com/vue-router@3.0.0/dist/vue-router.js"></script>
  <script src="app.js"></script>
</body>
```

Filename: app.js

```
const records = {
  1: {albums: "Heartrisers", songs: 20, genre: 4},
  2: {albums: "Pianobind", songs: 13, genre: 5}
}

const notFound = { template: `<h1>Unknown record!</h1>` }
const myRecords = {
  template: `<h1>{{record.albums}} has {{record.songs}} songs across
    {{record.genre}} genres.</h1>`,
  data() {
    return {record: records[this.$route.params.id]}
  },
}

const router = new VueRouter({
  routes: [
    { path: '/records/:id', component: myRecords },
    { path: '*', component: notFound },
  ],
})
new Vue({
  el: '#app',
  template: '<div><router-view /></div>',
  router,
})
```

Suppose the application is running on “<http://127.0.0.1:8080>”, select the correct option(s)?

Options :

For the endpoint, <http://127.0.0.1:8080/records/1>, The browser will render:
6406532578523. * **Hearttrisers has 20 songs across 4 genres.**

For the endpoint, <http://127.0.0.1:8080/#/records/2>, The browser will render:

6406532578524. ✓ **Pianobind has 13 songs across 5 genres.**

For the endpoint, <http://127.0.0.1:8080/#/records>, The browser will render:

6406532578525. ✓ **Unknown record!**

For the endpoint, <http://127.0.0.1:8080/#/records/3>, The browser will render:

6406532578526. ✖ **Unknown record!**

MLT

Section Id :	64065353283
Section Number :	12
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
Section Marks :	50
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 :	640653112734
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 189 Question Id : 640653770902 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 : MACHINE LEARNING
TECHNIQUES (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 :

6406532578531. ✓ YES

6406532578532. ✘ NO

Sub-Section Number : 2

Sub-Section Id : 640653112735

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770919 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 : (190 to 191)

Question Label : Comprehension

Consider a binary classification problem with a training dataset of 80 points, evenly distributed between two classes (40 points in each class). You decide to train a k-NN algorithm with $k = 3$. Each point is considered its own neighbor during classification.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 190 Question Id : 640653770920 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

What is the minimum number of misclassifications that can occur in the training dataset when using this k-NN algorithm?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 191 Question Id : 640653770921 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Assuming there are outliers, the decision boundary becomes smoother with increasing value of k in a k-NN algorithm (Fill in 1 for yes and 0 for no)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Sub-Section Number : 3

Sub-Section Id : 640653112736

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770903 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 : (192 to 193)

Question Label : Comprehension

Consider a regression problem where you are tasked with predicting the sale prices of houses based on their square footage. You decide to experiment with two different models:

Model P : $\hat{y}_i = w_0 + w_1x$

Model Q : $\hat{y}_i = w_0 + w_1x + w_2x^2$

The training dataset consists of information on 200 houses, and you use the models to make predictions on a test dataset of 50 houses. The Mean Squared Error (MSE) is chosen as the evaluation metric.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 192 Question Id : 640653770904 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

Considering the specific context of predicting house prices based on square footage, which model is more likely to provide accurate predictions on the training dataset?

Options :

6406532578533. ✘ Model P

6406532578534. ✓ Model Q

6406532578535. ✘ Both models are equally likely to provide accurate predictions

6406532578536. ✘ It depends on the distribution of house prices in the dataset

Question Number : 193 Question Id : 640653770905 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Identify the factors that could influence the model's performance on the training dataset in this housing price prediction scenario. Select all correct statements:

Options :

6406532578537. ✓ Model P may struggle to capture non-linear relationships present in house price data.

6406532578538. ✓ Model Q might be sensitive to outliers in the square footage variable.

6406532578539. ✘ The choice between Model P and Model Q depends on the budget constraints of potential homebuyers.

6406532578540. ✘ Model Q will always perform well on the test dataset.

Question Id : 640653770916 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 : (194 to 195)

Question Label : Comprehension

Consider a naive Bayes model is trained on the following data matrix X of shape (d, n) and corresponding label vector y :

$$X = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix} \quad y = [1 \ 0 \ 1 \ 1]^T$$

Assume that \hat{p} and $\hat{p}_j^{y_i}$ are estimates for $P(y = 1)$ and $P(f_j = 1|y = y_i)$, respectively. Here, f_i ; $i = 1, 2, 3$ is the i^{th} feature.

These parameters are estimated using MLE.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 194 Question Id : 640653770917 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

Calculate the value of \hat{p}_2^1

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.30 to 0.35

Question Number : 195 Question Id : 640653770918 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

Calculate the value of \hat{p}_1^1

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.30 to 0.35

Sub-Section Number : 4

Sub-Section Id : 640653112737

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653770908 **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 : (196 to 197)

Question Label : Comprehension

Consider a dataset with the following data points and the target variable:

Sample No	x	y
1	3	8
2	0	3
3	5	12
4	6	13

The linear regression model is given by $y = w_0 + w_1x$. Assume that the Leave-One-Out Cross-Validation technique is applied.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 196 **Question Id :** 640653770909 **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

Enter the value of w_1 obtained when the 3rd sample is used as the validation data point.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

1.65 to 1.70

Question Number : 197 **Question Id :** 640653770910 **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 will be the predicted value for the left-out data point?

Options :

6406532578547. ✘ 12

6406532578548. ✘ 13

6406532578549. ✘ 12.3

6406532578550. ✓ 11.3

6406532578551. ✘ None of these

Sub-Section Number : 5

Sub-Section Id : 640653112738

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 198 Question Id : 640653770907 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

Kernel regression with a polynomial kernel of degree three is applied on a data set $\{X, y\}$. Let the weight vector be given by

$$w = \phi(X)[2.3, -1.0, 0.4, -0.7]^T$$

Here $\phi(X)$ is the transformed data matrix whose i^{th} column is $\phi(x_i)$. What will be the prediction for the data point $[0, 0, 0, 0]^T$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 199 Question Id : 640653770915 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

Suppose you have a five-class classification problem where class label $y \in \{0, 1, 2, 3, 4\}$ and each training example x_i has binary features $f_1, f_2, f_3 \in \{0, 1\}$. How many parameters do we need to know to classify an example using Naive Bayes classifier?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

19 to 20

Sub-Section Number :	6
Sub-Section Id :	640653112739
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 200 Question Id : 640653770906 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 X be the data matrix of shape (d, n) and y be the corresponding label vector. A linear regression model of the form $\hat{y}_i = w^T x_i$ is fit using the squared error on the same dataset. If the solution w^* to the optimization problem is orthogonal to the subspace spanned by the data points (columns of matrix X), what will be the squared error?

Options :

6406532578541. ✘ 0

6406532578542. ✘ 1

6406532578543. ✓ $\|y\|^2$

6406532578544. ✘ Insufficient information to answer

Sub-Section Number :	7
Sub-Section Id :	640653112740
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 201 Question Id : 640653770911 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

Given a design matrix $X \in \mathbb{R}^{d \times n}$ and a target vector $Y \in \mathbb{R}^{n \times 1}$, where d represents the number of features, n represents the number of data points, and the data is defined as:

$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

$$Y = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$$

Calculate the coefficients β for Ridge regression with $\lambda = 1$.

Options :

6406532578552. ✘ $\beta = [0.5, 0.5]$

6406532578553. ✘ $\beta = [1, 0.5]$

6406532578554. ✓ $\beta = [0.54, 0.88]$

6406532578555. ✘ $\beta = [0.67, 0.33]$

6406532578556. ✘ None of these

Question Number : 202 Question Id : 640653770912 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 training dataset for a binary classification problem is as follows:

$$\{ (\mathbf{u}, 1), (-2\mathbf{u}, 0), (3\mathbf{u}, 1), (-4\mathbf{u}, 0) \}$$

where $\mathbf{u} \in \mathbb{R}^d$ is a constant, and the labels belong to 0, 1. Let \mathbf{w} be the weight vector of a linear classifier. What condition should the weight vector satisfy for the zero-one loss to be zero on this dataset?

Options :

6406532578557. ✘ $\mathbf{w}^T \mathbf{u} < 0$

6406532578558. ✓ $\mathbf{w}^T \mathbf{u} > 0$

6406532578559. ✘ $\mathbf{w}^T \mathbf{u} = 0$

6406532578560. ✘ We can never find a \mathbf{w} for which the zero-one loss becomes zero on this dataset.

Sub-Section Number : 8

Sub-Section Id : 640653112741

Question Shuffling Allowed : Yes

Is Section Default? : null

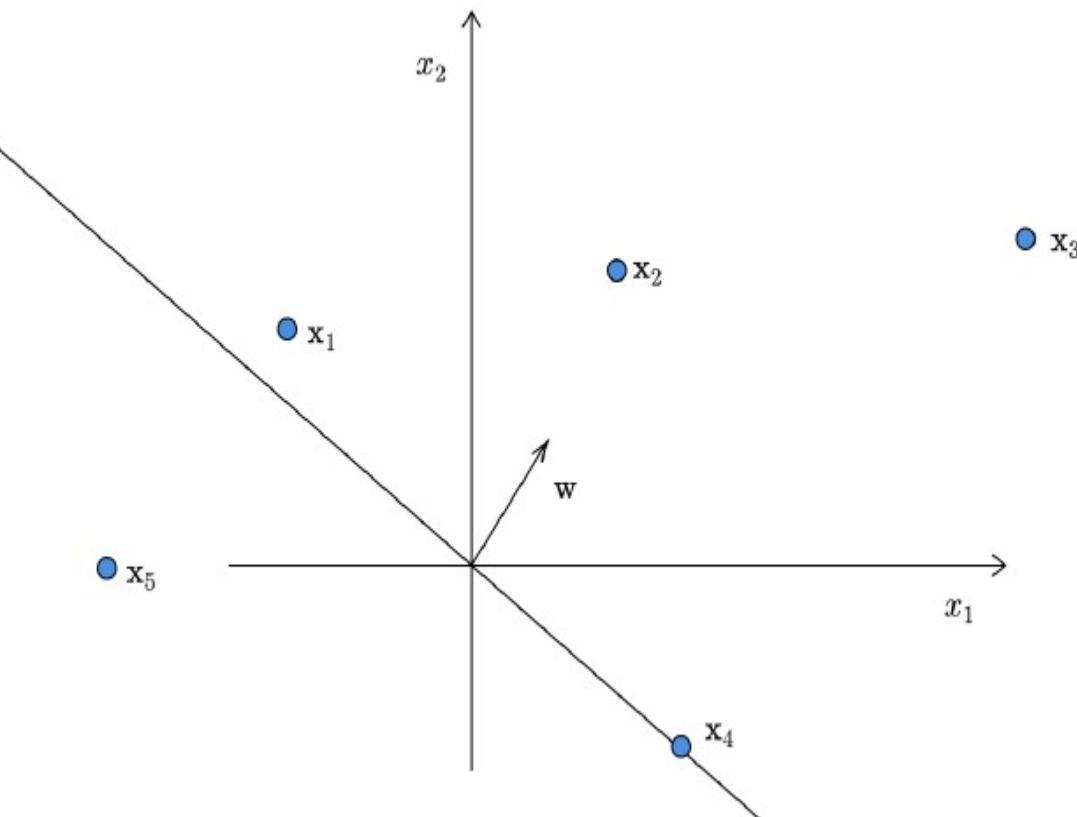
Question Number : 203 Question Id : 640653770913 Question Type : MSQ Is Question

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 the following data-points in a binary classification problem. \mathbf{w} is the weight vector corresponding to a linear classifier. The labels are +1 and -1.



Which of the following statements are true?

Options :

6406532578561. ✓ $0 < \mathbf{w}^T \mathbf{x}_1 < \mathbf{w}^T \mathbf{x}_2 < \mathbf{w}^T \mathbf{x}_3$

6406532578562. ✓ $\mathbf{w}^T \mathbf{x}_4 = 0$

6406532578563. ✗ $0 < \mathbf{w}^T \mathbf{x}_2 < \mathbf{w}^T \mathbf{x}_1 < \mathbf{w}^T \mathbf{x}_3$

6406532578564. ✓ $\mathbf{w}^T \mathbf{x}_5 < 0$

6406532578565. ✗ $\mathbf{w}^T \mathbf{x}_3 < 0$

Question Number : 204 Question Id : 640653770914 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

Select all true statements.

Options :

In Decision tree, if a question Q_1 is "better" than question Q_2 , then information gains for Q_1 is greater than information gains Q_2 always.
6406532578566. ✓

The training dataset is required while predicting the label of a test-point in the k-NN algorithm.
6406532578567. ✓

A question of the form $f_k \leq \theta$ always partitions the dataset into two non-empty sets.
6406532578568. ✗

The depth of the tree is a hyperparameter and has to be chosen using cross validation.
6406532578569. ✓

6406532578570. ✗ Decision trees are prone to overfit if the maximum depth is set too low.

MLP

Section Id :	64065353284
Section Number :	13
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	23
Number of Questions to be attempted :	23
Section Marks :	50
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 :	640653112742
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 205 Question Id : 640653770922 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 : MACHINE LEARNING PRACTICE (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 :

6406532578576. ✓ YES

6406532578577. ✘ NO

Sub-Section Number :	2
Sub-Section Id :	640653112743
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 206 Question Id : 640653770923 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

Consider following code snippet:

```
from sklearn.utils.multiclass import type_of_target
import numpy as np
print(type_of_target(np.array([['horror', 'fantasy'],
                             ['adventure', 'fantasy'],
                             ['adventure', 'fantasy']])))
print(type_of_target([72, 17.89, 63.00]))
print(type_of_target([0, 1, 1, 0]))
```

What will be the output of the above code snippet in the correct sequence?

Options :

‘multilabel-indicator’
‘multiclass’

6406532578578. ✘ ‘binary’

‘multiclass’
‘multiclass’

6406532578579. ✘ ‘binary’

‘binary’
‘multiclass’

6406532578580. ✘ ‘multilabel-indicator’

‘multilabel-multioutput’
‘continuous’

6406532578581. ✓ ‘binary’

Question Number : 207 Question Id : 640653770924 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

Consider the following code snippet and assume all the dependencies are imported:

```
from sklearn.linear_model import Perceptron  
clf = Perceptron(max_iter=100,random_state=1729)
```

He learnt that every time he calls `fit()` method on 'clf', the parameters learnt from the previous training session (i.e. previous call to '`fit()`') are lost. What should he change in code so that this problem is removed?

Options :

6406532578582. ✓ Set `warm_start=True`

6406532578583. ✗ Combine training data from different training sessions

6406532578584. ✗ Set `retain_parameters=True`

6406532578585. ✗ This problem can not be solved.

Question Number : 208 Question Id : 640653770925 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

Consider a binary classification dataset with labeled as 98% negative samples and 2% positive samples. A model is trained on this data, which of the following evaluation metrics are suitable for measuring effectiveness of this model:

Options :

6406532578586. ✗ accuracy

6406532578587. ✖ Mean Absolute Error

6406532578588. ✖ smote

6406532578589. ✓ F-1 score

Question Number : 209 Question Id : 640653770926 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

Consider the following code block:

```
from sklearn.datasets import make_regression
X, y = make_regression(n_samples = 1000,
                       n_features = 5,
                       n_informative = 2,
                       random_state=42)

from sklearn.linear_model import SGDRegressor
sgd1 = SGDRegressor(alpha=1e-3,
                     random_state=42,
                     penalty='-----', )
sgd1.fit(X, y)
print(sgd1.coef_)

sgd2 = SGDRegressor(alpha=1e-3,
                     random_state=42,
                     penalty='-----')
sgd2.fit(X, y)
print(sgd2.coef_)
```

What are the most suitable values to be filled in the two blank spaces (in that order) in the code to expect the following output?:

[1.68059576e+01, 1.89752021e+01, 7.49212536e-04, -6.53455275e-04, 3.01471918e-04]

[16.82258106, 18.99248887, 0., 0., 0.]

Options :

6406532578590. ✖ 'l1', 'l2'

6406532578591. ✘ '11', None

6406532578592. ✓ '12', '11'

6406532578593. ✘ '12', None

Question Number : 210 Question Id : 640653770927 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

What might be the possible output of the following code:

```
from sklearn.metrics import mean_absolute_error
y_true = [3, -0.5, 2, 7]
y_pred = [2.5, 0.0, 2, 8]
mean_absolute_error(y_true, y_pred)
```

Options :

6406532578594. ✘ 0.00

6406532578595. ✓ 0.50

6406532578596. ✘ 0.72

6406532578597. ✘ 1.00

Question Number : 211 Question Id : 640653770928 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

You're building a machine learning pipeline to preprocess data and train a model on a

classification task. You decide to use a pipeline that includes data preprocessing and a support vector machine (SVM) classifier. The following code snippet demonstrates the pipeline creation and usage:

```
from sklearn.pipeline import Pipeline
from sklearn.svm import SVC
from sklearn.preprocessing import StandardScaler
import numpy as np

# Simulated data (features: X, target: y)
X = np.array([[2, 3], [5, 7], [8, 10]])
y = np.array([0, 1, 0])

# Create a pipeline with StandardScaler and SVM classifier
pipeline = Pipeline([('scaler', StandardScaler()),
                     ('svm', SVC())])

# Fit the pipeline on training data
pipeline.fit(X, y)

# Make predictions using the trained pipeline
predictions = pipeline.predict(X)
```

What is the purpose of using the pipeline in this code snippet?

Options :

- 6406532578598. ❌ The pipeline combines multiple models for better model performance.
- 6406532578599. ❌ The pipeline allows for simultaneous training of the scaler and classifier.
- 6406532578600. ✓ The pipeline simplifies the code by encapsulating preprocessing and modeling steps.
- 6406532578601. ❌ The pipeline ensures that only linear SVM can be used for this classification task.

Question Number : 212 Question Id : 640653770929 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

Given below code to load a huge file name as filename.csv and this file is not loading at once in the system which parameter should be added to pd.read_csv to load this file ?

```
import pandas as pd
from sklearn.linear_model import SGDRegressor
for train_df in pd.read_csv("filename.csv", _____=1024):
    X = train_df.iloc[:, :-1]
    y = train_df.iloc[:, -1]
    model = SGDRegressor()
    model.partial_fit(prep_X,y)
```

Options :

6406532578602. ✘ max_depth

6406532578603. ✘ C

6406532578604. ✓ chunkszie

6406532578605. ✘ warm_start

Question Number : 213 Question Id : 640653770930 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

What will the output for below code

```
from sklearn.feature_extraction.text import CountVectorizer
corpus = [ 'This is the first document.',
           'This document is the second document.' ]
vectorizer = CountVectorizer()
vectorizer.fit_transform(corpus)
print(vectorizer.get_feature_names_out())
```

Options :

6406532578606. ✘ {'this': 5, 'is': 2, 'the': 4, 'first': 1, 'document': 0, 'second': 3}

6406532578607. ✘ [3,1,2,1,2,2]

6406532578608. ✓ ['document', 'first', 'is', 'second', 'the', 'this']

6406532578609. ✘ [0,1,2,3,4,5]

Question Number : 214 Question Id : 640653770931 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

Imagine you're training a Perceptron using sklearn with the following code:

```
from sklearn.linear_model import Perceptron
X = [[0, 0.5], [1, 1.5], [1, 2], [2, 3]]
y = [-1, -1, 1, 1]
clf = Perceptron(eta0 = 1, tol=None, shuffle=True, random_state=42)
clf.fit(X, y)
iterations = clf.n_iter_
```

Given the linearly separable nature of the data, how many iterations would it most likely take for the perceptron to converge? What will be the value of iterations?

Options :

6406532578610. ✘ iterations = 1

6406532578611. ✘ iterations = 10

6406532578612. ✓ iterations value can vary since the data is being shuffled in each epoch.

6406532578613. ✘ iterations = 5

Question Number : 215 Question Id : 640653770932 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

Consider the following code snippet using scikit-learn:

```
from sklearn.preprocessing import StandardScaler
from sklearn.pipeline import Pipeline
from sklearn.svm import SVC
from sklearn.model_selection import GridSearchCV

pipeline = Pipeline([('scaler', StandardScaler()),
                     ('classifier', SVC())])

param_grid = {'scaler__with_mean': [True, False],
              'classifier__C': [0.1, 1, 10],
              'classifier__kernel': ['linear', 'rbf'],
              'classifier__gamma': [0.1, 1, 10]}

grid_search = GridSearchCV(estimator= pipeline,
                           param_grid= param_grid,
                           cv=5,
                           scoring='accuracy',
                           verbose=2)
grid_search.fit(X_train, y_train)
```

Assuming that `X_train` and `y_train` are given and the features are not sparse, which of the following statements about the given code is correct?

Options :

The StandardScaler will scale both `X_train` and `y_train` before training a
6406532578614. ✘ classifier.

All the classifiers will not be trained on the scaled data with zero mean and
6406532578615. ✓ unit variance.

The pipeline always uses a radial basis function ('rbf') as the kernel for the
6406532578616. ✘ SVC() classifier.

A total of 18 different combinations of hyperparameters were trained during 6406532578617. ✖ the GridSearchCV fitting.

Question Number : 216 Question Id : 640653770933 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

Consider the following code snippet that employs LogisticRegression from sklearn on a feature matrix X and corresponding label vector y:

```
from sklearn.linear_model import LogisticRegression  
model = LogisticRegression(class_weight='balanced', C=0.5)  
model.fit(X, y)
```

Given the code above, which of the following statements is true?

Options :

6406532578618. ✖ The logistic regression model will give equal importance to both classes in an imbalanced dataset.

6406532578619. ✖ The model does not use any regularization because the parameter C is set.

6406532578620. ✖ The model will perform equally well on both imbalanced and balanced datasets due to the class_weight parameter.

6406532578621. ✓ The value of C indicates that the model will apply a regularization.

Question Number : 217 Question Id : 640653770943 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

Which of the following is true for a hard margin SVM algorithm ?

Options :

6406532578649. ❌ It does not create hyperplanes as a classification decision boundary

6406532578650. ❌ It is robust to outliers

6406532578651. ✓ It will correctly classify all the datapoints if the data is linearly separable.

6406532578652. ❌ It is mostly used for clustering the data

Sub-Section Number : 3

Sub-Section Id : 640653112744

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 218 Question Id : 640653770934 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are correct regarding RadiusNeighborsClassifier

Options :

Only n_neighbors in the range of some radius R are used to compute the label of a sample.

6406532578622. ❌

All the neighbours in the range of some radius R are used to compute the label of a sample.

6406532578623. ✓

Feature Scaling helps in improving the score of RadiusNeighborsClassifier model

6406532578624. ✓

6406532578625. ✘ LabelEncoder helps in improving the score of RadiusNeighborsClassifier model

Question Number : 219 Question Id : 640653770935 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is correct?

Options :

6406532578626. ✓ SGDClassifier(loss= "perceptron") is a stochastic version of a perceptron model

6406532578627. ✘ SGDClassifier(loss= "percept") is a stochastic version of a perceptron model

6406532578628. ✓ SGDClassifier(loss= "log_loss") is a stochastic version of a logistic classifier model

6406532578629. ✘ SGDClassifier(loss= "sigmoid") is a stochastic version of a logistic classifier model

Question Number : 220 Question Id : 640653770936 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following option(s) are correct for the precision-recall curve

Options :

6406532578630. ✓ A high area under the curve represents both high recall and high precision.

6406532578631. ✓ The precision-recall curve shows the trade-off between precision and recall for different threshold values.

6406532578632. ✗ The precision-recall curve used to evaluate unsupervised algorithm for imbalanced clustered data.

6406532578633. ✗ None of these

Question Number : 221 Question Id : 640653770937 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements are true?

Options :

6406532578634. ✓ KNeighborsClassifier with low values of n_neighbors produces complex decision boundaries.

6406532578635. ✗ KNeighborsClassifier with low values of n_neighbors produces smooth decision boundaries.

6406532578636. ✓ In KNeighborsClassifier the scale of the features(columns) can impact the decision boundaries.

6406532578637. ✗ None of these

Question Number : 222 Question Id : 640653770939 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following code snippet that employs LogisticRegression from sklearn on a feature matrix X and corresponding label vector y:

```
from sklearn.linear_model import LogisticRegression  
model = LogisticRegression(C=0.8, multi_class='multinomial', max_iter=1000)  
model.fit(X, y)
```

Given the code above, which of the following statements is true?

Options :

6406532578642. ✘ The LogisticRegression model is set up for binary classification.

6406532578643. ✘ The model does not use any regularization because the parameter C is set.

The model has been specifically set up to handle a multi-class classification

6406532578644. ✓ problem using a softmax regression approach.

The model might iterate through the data multiple times, with a maximum

6406532578645. ✓ limit set at 1000 iterations.

Sub-Section Number : 4

Sub-Section Id : 640653112745

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 223 Question Id : 640653770938 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Fill in the missing parameter value in the following estimator that can be used to classify the data

```
from sklearn.svm import SVC  
clf = SVC(kernel = _____)  
clf.fit(X, y)
```

Options :

6406532578638. ✓ 'poly'

6406532578639. ✘ 'lasso'

6406532578640. ✘ 'scale'

6406532578641. ✓ 'sigmoid'

Sub-Section Number : 5

Sub-Section Id : 640653112746

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 224 Question Id : 640653770940 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Consider the following code snippet:

```
from sklearn.datasets import load_iris
from sklearn.decomposition import PCA
from sklearn.preprocessing import PolynomialFeatures
from sklearn.pipeline import FeatureUnion
X = load_iris().data # X.shape = (150,4)

poly_feature = PolynomialFeatures(degree=2, include_bias=True)
union = FeatureUnion([('poly', poly_feature),
                      ('pca', PCA(n_components=2))])

X_transformed = union.fit_transform(X)
print(X_transformed.shape)
```

If the shape of X is (150,4). How many total columns are there in the X_transformed ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

17

Question Number : 225 **Question Id :** 640653770941 **Question Type :** SA **Calculator :** None

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

Correct Marks : 2

Question Label : Short Answer Question

Please consider the following data and code for a regression problem with symbols in mind:

- >>> : Represents input code
- # : Represents comment in a code
- ... : Represents code continuation
- Without any symbols at the beginning of a line then it is output of just above input line of code.

```
>>> import pandas as pd
>>> from sklearn.preprocessing import OneHotEncoder
>>> from sklearn.linear_model import LinearRegression
>>> data_array = [[19, 'Black', 74],
...                 [19, 'Blue', 75],
...                 [19, 'Red', 85],
...                 [24, 'Black', 70],
...                 [24, 'Blue', 70],
...                 [24, 'Red', 89],
...                 [30, 'Black', 78],
...                 [30, 'Blue', 76],
...                 [30, 'Red', 90]]

>>> data = pd.DataFrame(data_array,columns=["Age",
...                                             "Car_color",
...                                             "Accidents_per_1000_Driver"])

>>> X = data.drop("Accidents_per_1000_Driver", axis=1)
>>> y = data["Accidents_per_1000_Driver"]

>>> ohe = OneHotEncoder(sparse_output=False)
>>> X[['Black', 'Blue', 'Red']] = ohe.fit_transform(X[['Car_color']])
>>> X.drop("Car_color", axis=1, inplace=True)

>>> lr = LinearRegression().fit(X, y)

>>> print(lr.coef_)
[0.32, -4.55, -4.88, 9.44]

>>> print(lr.intercept_)
70.75
```

How many Accidents per 1000 Driver predicted by the model for Age 27 and driving a Red car ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

88.3 to 89.3

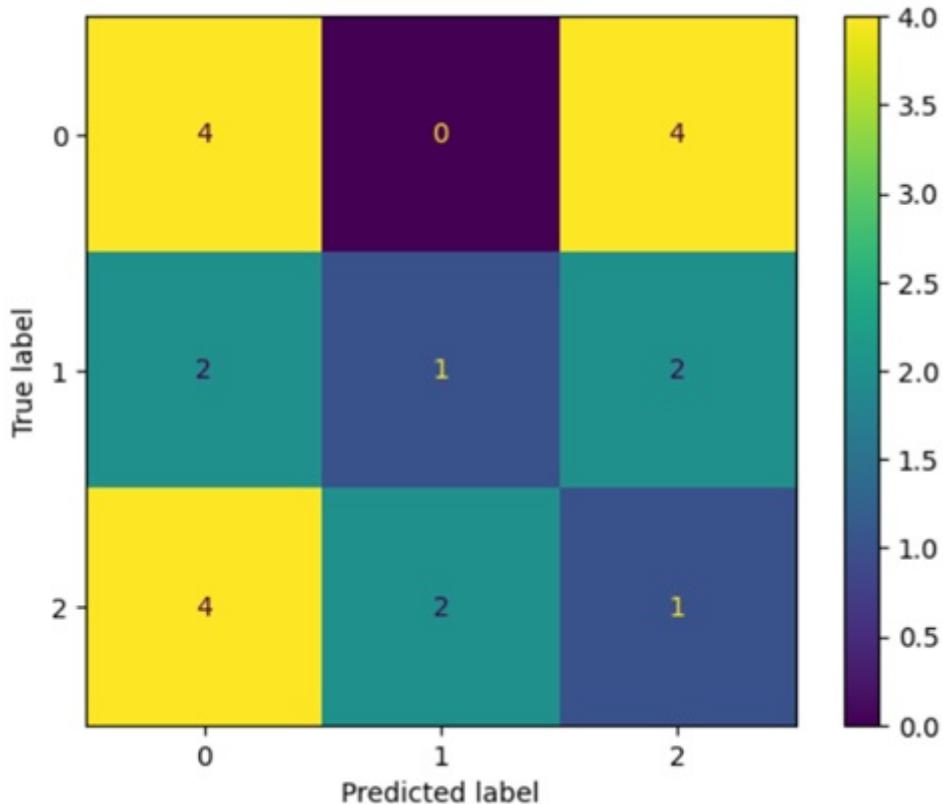
Question Number : 226 Question Id : 640653770944 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

After training a multi-class classifier, you obtain the following confusion matrix. What will be the weighted average of the recall score for each class?



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.295 to 0.315

Sub-Section Number : 6

Sub-Section Id : 640653112747

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 227 Question Id : 640653770942 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

What is the output of the following code?

```
from sklearn.neighbors import KNeighborsClassifier
X = [[2,3], [5,6], [8,9], [10, 11], [15,16], [20,21]]
y = [2, 1, 0, 1, 2, 1]

knn = KNeighborsClassifier (n_neighbors=3,
                           metric='euclidean',
                           weights='uniform')

knn.fit (X, y)
print (knn.predict([[8,9]]))
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Business Analytics

Section Id :

64065353285

Section Number :

14

Section type :

Online

Mandatory or Optional :

Mandatory

Number of Questions :

5

Number of Questions to be attempted :	5
Section Marks :	20
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 :	640653112748
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 228 Question Id : 640653770945 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 : BUSINESS ANALYTICS \(COMPUTER BASED EXAM\)](#)"

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 :

6406532578654. ✓ YES

6406532578655. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653112749

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 229 Question Id : 640653770946 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Say a demand response curve is modelled as a constant elasticity curve. If Q1 is 2400 units, Q2 is 1500 units, P1 is Rs. 100 and P2 is Rs. 200, then what is the elasticity of the curve?

(Note: Enter the answer rounded to two decimal places. For example, if the answer is "1.234", then enter it as "1.23")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.66 to 0.70

Sub-Section Number :

3

Sub-Section Id :

640653112750

Question Shuffling Allowed :

No

Is Section Default? :

null

Question Id : 640653770947 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 : (230 to 233)

Question Label : Comprehension

A parts supplier must assign supply from 5 warehouses (W1, W2, W3, W4 and W5) to 3 customers (C1, C2 and C3), such that the total demand of 300 units for the three customers is satisfied. The warehouse capacities are 85, 55, 75, 65 and 40, for W1, W2, W3, W4 and W5 respectively. A

warehouse can supply any number of customers. The cost to supply a customer from a given warehouse is provided in Table-1. Given this information, answer the subquestions.

Customer	Cost to supply a warehouse (Rs./ unit)				
	W1	W2	W3	W4	W5
C1	100	80	75	88	133
C2	50	85	120	112	94
C3	120	75	90	93	143

Table-1

Sub questions

Question Number : 230 Question Id : 640653770948 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

How many decision variables are present in the standard primal formulation of the given problem?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Set

Text Areas : PlainText

Possible Answers :

1

15

Question Number : 231 Question Id : 640653770949 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

How many constraints are present in the standard primal formulation of the given problem?

(Note: Exclude the count of non-negativity constraints when you input your answer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Set

Text Areas : PlainText

Possible Answers :

3

7

Question Number : 232 Question Id : 640653770950 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

To reduce risk, it is proposed to split the total demand evenly across all 5 warehouses. Then is it a feasible solution?

Options :

6406532578659. ✘ Yes

6406532578660. ✓ No

Question Number : 233 Question Id : 640653770951 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

If W1 supplies 75 units, W2 supplies 55 units, W3 supplies 75 units, W4 supplies 60 units and W5 supplies 35 units, then how many decision variables in the dual will have a **non-zero value**?

(Note: Enter your answer after you formulate the dual based on the standard form of the primal)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Id : 640653770952 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 : (234 to 239)

Question Label : Comprehension

Milo's Motors (MM) is a motorcycle brand that manufactures electric two wheelers. MM wants to understand the relationship between "Mileage", "Storage space" and "Charging Time in Minutes" on "Sales volume". The owner of the company, Dr. Milo, only has half-baked knowledge of regression. Hence, several regression models (Model-1, Model-2, Model-3, Model-4, Model-5, Model-6, Model-7, Model-8, Model-9 and Model-10) which are given below were built on appropriate available data by Dr. Milo. Given this information, answer the subquestions.

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	334383.3			
Residual	17				
Total		10412551			

Model-1: Partial ANOVA output when regressing “Sales volume” and “Mileage”

	<i>Coefficients</i>	<i>Standard Error</i>
Intercept	47.20077094	4.584182553
Storage Space	0.781643656	0.114164154

Model-2: Partial output when regressing “Mileage” and “Storage Space”

	<i>Coefficients</i>	<i>Standard Error</i>
Intercept	65.81368372	7.033106906
Charging Time in minutes	-0.215893138	0.049858351

Model-3: Partial output when regressing “Storage Space” and “Charging Time in minutes”

	<i>Coefficients</i>	<i>Standard Error</i>
Intercept	308.0125132	53.87791105
Mileage	-2.304781359	0.69468086

Model-4: Partial output when regressing “Charging Time in minutes” and “Mileage”

	<i>Coefficients</i>	<i>Standard Error</i>
Intercept	98.87754599	7.250193359
Charging Time in minutes	-0.170523674	0.051397297

Model-5: Partial output when regressing “Mileage” and “Charging Time in minutes”

	<i>Coefficients</i>	<i>Standard Error</i>
Intercept	-34.38432441	10.63536513
Mileage	0.938871236	0.137128267

Model-6: Partial output when regressing “Storage Space” and “Mileage”

	<i>Coefficients</i>	<i>Standard Error</i>
Intercept	222.6523985	22.52775312
Storage Space	-2.429330848	0.56102955

Model-7: Partial output when regressing “Charging time in minutes” and “Storage Space”

	<i>Coefficients</i>	<i>Standard Error</i>
Intercept	5353.222047	455.4019129
Storage Space	-17.4798574	11.34129661

Model-8: Partial output when regressing “Sales” and “Storage Space”

	<i>Coefficients</i>	<i>Standard Error</i>
Intercept	2990.697485	250.4961952
Charging Time in Minutes	12.95643851	1.775790898

Model-9: Partial output when regressing “Sales” and “Charging Time in minutes”

ANOVA				
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression		10266630.47		
Residual			9728.032	
Total		18		

	<i>Coefficients</i>	<i>Standard Error</i>
Intercept	-222.5640769	222.6565966
Mileage	26.571306	3.242212111
Storage space	8.90325534	3.342287418
Charging time in minutes	19.40962696	0.659759192

Model-10: Partial output when regression “Sales” with all the three explanatory variables

Sub questions

Question Number : 234 Question Id : 640653770953 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

How many observations (rows) are present in the data set used to build Model-1?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

19

Question Number : 235 Question Id : 640653770954 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the total indirect effect of "Mileage" on "Sales Volume"?

(Note: Enter the answer rounded to two decimal places. For example, if the answer is "1.234", then enter it as "1.23")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

-37.0 to -36.0

Question Number : 236 Question Id : 640653770955 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the value of the "T-statistic" associated with the intercept in Model-3?

(Note: Enter the answer rounded to two decimal places. For example, if the answer is "1.234", then enter it as "1.23")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

9.30 to 9.40

Question Number : 237 Question Id : 640653770956 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the adjusted R-Square value for Model-10?

(Note: Enter the answer rounded to two decimal places. For example, if the answer is "1.234", then enter it as "1.23")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.97 to 0.99

Question Number : 238 Question Id : 640653770957 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

What is F-statistic for Model-10?

(Note: Enter the answer rounded to two decimal places. For example, if the answer is "1.234", then enter it as "1.23")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

351 to 352

Question Number : 239 Question Id : 640653770958 Question Type : MSQ Is Question

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

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

For which of the following "Tabulated F" values, will the **Null Hypothesis NOT BE REJECTED** for Model-10?(Choose all that is applicable)

Options :

6406532578667. ✘ 240

6406532578668. ✘ 350

6406532578669. ✓ 480

6406532578670. ✓ 520

Question Id : 640653770959 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 : (240 to 245)

Question Label : Comprehension

An AI engine to scrutinize applications for the BS program is being developed. The aim of the AI engine is to shortlist applicants who have the highest chance of completing the program. Hence, the AI engine classifies every applicant as either “Selected” or “Not Selected” based on the “Probability of Completion” which is computed using an applicant’s previous academic and professional records (X mark, XII mark, work experience, conduct and number of extracurricular certificates)

To test the model, past student data was captured. Using the past data, the AI model predicted the probability for completion. This is provided in Table-2. The table also provides the information of whether the student actually completed the course. Given this information, answer the subquestions.

Student ID	Probability for the student to complete the course	Did the student actually complete the course
NBA11234	0.80	NO
NBC11245	0.62	YES
NBN31256	0.70	YES
NBN76340	0.52	YES
MNV89201	0.47	YES
JKS012671	0.71	NO
YTX00112	0.64	YES
TTQ32741	0.39	NO

Table-2

Sub questions

Question Number : 240 Question Id : 640653770960 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

At a threshold of 0.7, what is the accuracy of the AI engine?

(Note: Enter the answer in “%” rounded to two decimal places without the “%” symbol. For example, if the answer is “1.234%”, then enter it as “1.23”)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

37 to 39

Question Number : 241 **Question Id :** 640653770961 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

At a threshold of 0.7, what is the precision for "Not Selected" category for the AI engine?

(Note: Enter the answer in "%" rounded to two decimal places without the "%" symbol. For example, if the answer is "1.234%", then enter it as "1.23")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

24 to 26

Question Number : 242 **Question Id :** 640653770962 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

At a threshold of 0.7, what is the recall for "Selected" category for the AI engine?

(Note: Enter the answer in "%" rounded to two decimal places without the "%" symbol. For example, if the answer is "1.234%", then enter it as "1.23")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

39 to 41

Question Number : 243 **Question Id :** 640653770963 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

At a threshold of 0.4, how many "False Positives" is the AI engine predicting?

(Note: Enter the answer rounded to two decimal places. For example, if the answer is "1.234", then enter it as "1.23")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 244 **Question Id :** 640653770964 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

At a threshold of 0.4, how many "False Negatives" is the AI engine predicting?

(Note: Enter the answer rounded to two decimal places. For example, if the answer is "1.234", then enter it as "1.23")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 245 **Question Id :** 640653770965 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

At a threshold of 0.4, how many “True Negatives” is the AI engine predicting?

(Note: Enter the answer rounded to two decimal places. For example, if the answer is “1.234”, then enter it as “1.23”)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

System Commands

Section Id :	64065353286
Section Number :	15
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	15
Number of Questions to be attempted :	15
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 :	640653112751
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 246 Question Id : 640653770966 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 : SYSTEM COMMANDS (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 :

6406532578677. ✓ YES

6406532578678. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653112752
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 247 Question Id : 640653770967 Question Type : SA Calculator : None

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

Correct Marks : 6

Question Label : Short Answer Question

What will be output from the given command?

```
$ seq 1 5
1
2
3
4
5
$ seq 1 50 | grep "1\{1\}" | wc -l
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

14

Sub-Section Number : 3

Sub-Section Id : 640653112753

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 248 Question Id : 640653770968 Question Type : SA Calculator : None

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

Correct Marks : 8

Question Label : Short Answer Question

What will be output from the given command?

```
cat myfile.txt | grep -ic "^\U0001C"
```

The contents of myfile.txt are

```
  Lorem ipsum dolor sit amet,  
  consectetur adipisci elit,  
  sed eiusmod tempor incididunt  
  ut labore et dolore magna aliqua.
```

```
  Ut enim ad minim veniam,  
  quis nostrum exercitationem ullam  
  corporis suscipit laboriosam,  
  nisi ut aliquid ex ea commodi consequatur.
```

```
  Quis aute iure reprehenderit  
  in voluptate velit esse cillum  
  dolore eu fugiat nulla pariatur.
```

```
  Excepteur sint obcaecat cupiditat non proident,  
  sunt in culpa qui officia deserunt  
  mollit anim id est laborum.
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Sub-Section Number : 4

Sub-Section Id : 640653112754

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 249 **Question Id :** 640653770969 **Question Type :** MCQ **Is Question**

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

Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

What will be the output of the following script?

```
while read -r line; do
    echo "${line##* }"
done < file.txt
```

Options :

6406532578681. ❌ It will print the first word present in the file

6406532578682. ❌ It will print the first word of each line present in the file

6406532578683. ❌ It will print the last word present in the file

6406532578684. ✓ It will print the last word of each line present in the file

Question Number : 250 Question Id : 640653770970 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Using the following information, choose the word which will occur in the output of the last command.

```
$ cat -e text # $ marks the end of the line
Lorem ipsum dolor sit amet, $
consectetur adipisci elit, $
sed eiusmod tempor incididunt $ 
ut labore et dolore magna aliqua. $

$ 
Ut enim ad minim veniam, $
quis nostrum exercitationem ullam $
corporis suscipit laboriosam, $
nisi ut aliquid ex ea commodi consequatur. $

$ 
Quis aute iure reprehenderit $
in voluptate velit esse cillum $
dolore eu fugiat nulla pariatur. $

$ 
Excepitur sint obcaecat cupiditat non proident, $
sunt in culpa qui officia deserunt $
mollit anim id est laborum.$

$ 
$ cat -e text|grep -oE '[^ ]+$'
```

Options :

6406532578685. ✘ aliqua. \$

6406532578686. ✘ consequatur. \$

6406532578687. ✘ pariatur. \$

6406532578688. ✓ laborum.\$

6406532578689. ✘ all of these

Sub-Section Number :

5

Sub-Section Id :

640653112755

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 251 Question Id : 640653770971 Question Type : MSQ Is Question

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

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

The current working directory has files "1.txt", "2.txt", ... "100.txt". Select the shell script(s) that will rename all the files to "1.md", "2.md", ... "100.md" respectively.

Hint:

xargs

`xargs` is a command that reads items from the standard input, delimited by blanks or newlines, and executes the command (default is /bin/echo) one or more times with any initial-arguments followed by items read from standard input.

- `-I {}` is used to replace the string `{}` with the input from standard input.
- **Example:** `ls | xargs cat` will print the content of all the files present in the current directory.

find

`find` command is used to search and locate the list of files and directories based on conditions you specify for files that match the arguments.

- `-exec` command is used to perform an action on the found files.
- `\;` is used to end the command.
- `-name` is used to search the files based on the name.

Options :

6406532578690. ✓ `for i in {1..100}; do mv $i.txt $i.md; done`

6406532578691. ✓ `for i in {1..100}; do cp $i.txt $i.md; done`

6406532578692. ✓ `ls *.txt | xargs -I {} mv {} {}.md`

6406532578693. ✓ `find . -name "*.txt" -exec mv {} {}.md \;`

Sub-Section Number :	6
Sub-Section Id :	640653112756
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 252 Question Id : 640653770972 Question Type : MCQ Is Question

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

Correct Marks : 7

Question Label : Multiple Choice Question

The current working directory has files "1.txt", "2.txt", ... "100.txt". Print the file's content in the order "100.txt", "99.txt", ... , "2.txt", "1.txt" respectively.

Hint:

ls

`ls` command is used to list the files and directories in the current directory.

- `-r` is used to reverse the order while sorting (using string comparison).

sort

`sort` command is used to sort the lines of a text file(s).

- `-r` is used to reverse the order while sorting.
- `-n` is used to compare according to string numerical value.

xargs

`xargs` is a command that reads items from the standard input, delimited by blanks or newlines, and executes the command (default is `/bin/echo`) one or more times with any initial-arguments followed by items read from standard input.

- **Example:** `ls | xargs cat` will print the content of all files present in the current directory.

Options :

6406532578694. ✘ `cat $(ls -r *.txt)`

6406532578695. ✘ `ls | sort -r | xargs cat`

6406532578696. ❌ `cat $(ls *.txt)`

6406532578697. ✓ `ls | sort -rn | xargs cat`

Sub-Section Number : 7

Sub-Section Id : 640653112757

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 253 Question Id : 640653770973 Question Type : MSQ Is Question

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

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

The current working directory has files "1.txt", "2.txt", ... "100.txt". Select the script(s) to print the name of all the files such that each such file contains the name of the file as the sole content.

Example:

If `file1.txt` is printed by the script then the content of file `1.txt` is

1.txt

Options :

```
for i in {1..100}; do
    if [ "$(cat $i.txt)" = "$i.txt" ]; then
        echo $i.txt
    fi
done
```

6406532578698. ✓

```
for i in *.txt; do
    if [ "$(cat $i.txt)" = "$i.txt" ]; then
        echo "$(cat $i.txt)"
    fi
done
```

6406532578699. ✓

```
ls *.txt | while read i; do
    [[ "$(cat $i)" == "$i" ]] && echo $i
done
```

6406532578700. ✓

```
6406532578701. ✘ ls *.txt | xargs -I {} sh -c '[[ "$(cat {})" != "{}" ]] && echo {}'
```

Sub-Section Number : 8

Sub-Section Id : 640653112758

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 254 Question Id : 640653770974 Question Type : MSQ Is Question

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

Correct Marks : 10 Max. Selectable Options : 0

Question Label : Multiple Select Question

The current working directory has files "1.txt", "2.txt", ... "100.txt". Select the command(s) that will remove the files "70.txt", "71.txt", ... "99.txt".

Options :

6406532578702. ✓ rm {70..99}.txt

6406532578703. ✓ rm 7{0..9}.txt

6406532578704. ✓ rm 7?.txt; rm 8?.txt; rm 9?.txt

6406532578705. ✘ rm [780]*.txt

6406532578706. ✘ rm 7*.txt; rm 8*.txt; rm 9*.txt

6406532578707. ✓ rm \$(ls | grep -E "7[0-9].txt|8[0-9].txt|9[0-9].txt")

6406532578708. ✓ rm \$(ls | grep -E "7[0-9]|8[0-9]|9[0-9].txt")

6406532578709. ✓ rm \$(ls | grep -E "[789][0-9].txt")

6406532578710. ✓ rm \$(ls | grep "7[0-9].txt\|8[0-9].txt\|9[0-9].txt")

6406532578711. ✓ for i in {70..99}; do rm \$i.txt; done

6406532578712. ✓ ls | while read i; do [[\$i -ge 70 && \$i -le 99]] && rm \$i.txt; done

6406532578713. ✓ ls | while read i; do ((\$i >= 70 && \$i <= 99)) && rm \$i.txt; done

Sub-Section Number : 9

Sub-Section Id : 640653112759

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 255 Question Id : 640653770975 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

Using the following information, which of the command(s) from the following options will produce the desired output shown?

```
$ df -m
Filesystem 1M-blocks Used Available Use% Mounted on
/dev/sda1    102400  2048   100352   3%   /
/dev/sda2    204800  4096   200704   3%   /home
tmpfs        4096     0     4096   0%   /tmp
/dev/cdrom   1024     512     512  50%   /media/cdrom
/dev/sdb1    307200  102400  204800  34%   /mnt/data
/dev/sdc1    512000  102400  409600  20%   /mnt/backup
```

Desired Output

211456

Options :

6406532578714. ✓ `df -m | awk '{p+=$3}; END {print p}'`

6406532578715. ✘ `df -m | awk '{p=+$3}; END {print p}'`

6406532578716. ✓ `df -m | awk 'NR>1 && $1 !~ /^(tmpfs|cdrom)$/ {sum += $3} END {print sum}'`

6406532578717. ✘ `df -m | awk 'NR>1 && $1 !~ /^(tmpfs|cdrom)$/ {sum += $3} END {print sum}'`

Sub-Section Number : 10

Sub-Section Id : 640653112760

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 256 **Question Id :** 640653770976 **Question Type :** MSQ **Is Question**

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

Time : 0

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select the command(s) that list all regular users in the system. Assume that regular users have their UID greater than 999 and their default shell is bash (/usr/bin/bash).

Note: -E enables the Extended Regular Expression (ERE) in sed.

The file /etc/passwd contains the user information. The format of the file is given below

```
username:x:UID:GID:Description:Home Directory:Full Path to Shell
```

Hint

Usage of the tr command

```
$ echo 'a,b,c,d' | tr ',' '\n'  
a  
b  
c  
d
```

Options :

6406532578718. ❌ `sed -nE '/.+:::[[:digit:]]{4,}.*bash/ p' /etc/passwd`

6406532578719. ✓ `sed -nE '/.+:::[[:digit:]]{4,}.*bash/ p' /etc/passwd | cut -d: -f1`

6406532578720. ❌ `sed -nE '/.+:::[[:digit:]]{3}.*bash/ p' /etc/passwd`

6406532578721. ❌ `sed -nE '/.+:::[[:digit:]]{3}.*bash/ p' /etc/passwd | cut -d: -f1`

6406532578722. ❌ `awk '$3 > 999 && $7 ~ /.*bash/ {print $1}' /etc/passwd`

6406532578723. ✓ `awk -F ":" '$3 > 999 && $7 ~ /.*bash/ {print $1}' /etc/passwd`

6406532578724. ✓ cat /etc/passwd|tr ':' '\t'|awk '\$3 > 999 && \$7 ~ /.bash/ {print \$1}'

6406532578725. ✓ awk 'BEGIN{FS=":"} \$3 > 999 && \$7 ~ /.bash/ {print \$1}' /etc/passwd

Sub-Section Number : 11

Sub-Section Id : 640653112761

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 257 Question Id : 640653770977 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

Select the correct statement(s) based on the below script. Assume that file1 is not empty.

Hint:

The tee command not only takes the stdin and prints it to the terminal but also writes to the file given as an argument.

```
while read line; do
    echo $line
done < file1 > file2 | tee file3
```

Options :

6406532578726. ✗ file2 will be empty at the end of the execution

6406532578727. ✓ file3 will be empty at the end of the execution

6406532578728. ✗ The contents of file1 will be displayed in the terminal

6406532578729. ✗ file3 will contain the contents of file1

Question Number : 258 Question Id : 640653770978 Question Type : MCQ Is Question

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

Correct Marks : 6

Question Label : Multiple Choice Question

The tab-separated data file `pdata.txt` provided for cleanup showed every fourth and fifth line is a part of one line (first-merge is the first and the second line) (see the following examples in the hint). Choose the correct commands from the following options, which can merge every fourth and fifth (1-2, 5-6, 9-10, 13-14, etc...) line into one line to clean up the data file.

Hint:

Use the following information.

```
$ cat pdata.txt
Line1
Line2
Line3
Line4
Line5
Line6
Line7
Line8
Line9
Line10
Line11
Line12
Line13
Line14
$ sed 'N;s/\n/ /' pdata.txt
Line1 Line2
Line3 Line4
Line5 Line6
Line7 Line8
Line9 Line10
Line11 Line12
Line13 Line14
$ sed 'N;N;s/\n/ /' pdata.txt
Line1 Line2
Line3
Line4 Line5
Line6
Line7 Line8
Line9
Line10 Line11
Line12
Line13 Line14
Line15
```

Options :

6406532578730. ❗ `sed 'N;N;s/\n/ /' pdata.txt`

6406532578731. ❗ `sed -i 'N;N;s/\n/ /' pdata.txt`

6406532578732. ✓ sed -i 'N;N;N;s/\n/\t/' pdata.txt

6406532578733. ✗ sed -i 'N;N;N;s/\n/\t/' pdata.txt

Sub-Section Number : 12

Sub-Section Id : 640653112762

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 259 Question Id : 640653770979 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 7

Question Label : Multiple Choice Question

Select the sed script to pretty print a regular list from the file `mylist` in such a way that the first and last lines have the brackets, and the elements should be indented by a tab.

Note: The tab and newline characters are specified by `\t` and `\n` respectively.

Sample Input

```
[1,2,3,4]
```

Sample Output

```
[  
 1,  
 2,  
 3,  
 4  
 ]
```

Options :

6406532578734. ✓

```
sed 's/[\n\t]/\n/g' mylist |  
sed 's/\n/ /' |  
sed '/^[[blank:]]\{1,\}/ s/,/,\\n\\t/g'
```

6406532578735. *

```
sed 's/[\n\t]/\n/g' mylist |  
sed 's/\n/ /' |  
sed '/^[[blank:]]\{1,\}/ s/,/,\\n\\t/'
```

6406532578736. *

```
sed 's/[\n\t]/\n/g' mylist |  
sed 's/\n/ /' |  
sed '/^[[blank:]]\{1,\}/ s/,/,\\n\\t/g'
```

6406532578737. *

```
sed 's/[\n\t]/\n/g' mylist |  
sed 's/\n/ /' |  
sed '/^[[blank:]]\{1,\}/ s/,/,\\n\\t/'
```

Sub-Section Number :

13

Sub-Section Id :

640653112763

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 260 Question Id : 640653770980 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 8

Question Label : Multiple Choice Question

```

BEGIN {
    FS=","
}
{
    sum = 0
    for (i=1; i<=NF; i++) {
        if ($i ~ /^[+-]?[:digit:]]+\.?[:digit:]*$/) {
            sum += $i
        }
        else {
            print "Invalid data"
            exit 1
        }
    }
    print sum
}

```

Select the output to the above AWK script for the file given below.

```

1,2,3
1.1,2.1,3.1
-1.1,2.1,3.1
+1.1,2.1,3.1
a,b,2
.1,89,1

```

Options :

6406532578738. ❌ Invalid data

6406532578739. ✓
 6
 6.3
 4.1
 6.3
 Invalid data

6406532578740. ❌

6

6.3

4.1

6.3

2

Invalid data

6

6.3

4.1

6.3

2

1

6406532578741. ✘