

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 FOUNDATION DIPLOMA FN EXAM
	QDF2 01 Sep 2024
Subject Name :	2024 Sep01: IIT M FN EXAM QDF2
Creation Date :	2024-08-28 16:39:35
Duration :	180
Total Marks :	1015
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 :	64065320254
Group Maximum Duration :	0
Group Minimum Duration :	90

Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	1015
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

Sem1 CT

Section Id :	64065364159
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	18
Number of Questions to be attempted :	18
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134275
Question Shuffling Allowed :	No

Question Number : 1 Question Id : 640653905021 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : SEMESTER I: 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 :

6406533047140. ✓ YES

6406533047141. ✗ NO

Question Number : 2 Question Id : 640653905022 Question Type : MCQ Calculator : Yes

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 Maigudi 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
Carrots	Vegetables/Food	1.5	50
Soup	Toiletries	4	32
Tomatoes	Vegetables/Food	2	40
Bananas	Vegetables/Food	8	64
Socks	Footwear/Apparel	3	168
Curd	Dairy/Food	0.5	32
Milk	Dairy/Food	1.5	24
			567

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

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

Options :

6406533047142. ✓ Useful Data has been mentioned above.

6406533047143. ✗ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :

2

Sub-Section Id :

640653134276

Question Shuffling Allowed :

Yes

Question Number : 3 Question Id : 640653905023 Question Type : MCQ Calculator : Yes

Correct Marks : 5

Question Label : Multiple Choice Question

The given pseudocode is executed using the "Scores" dataset. What will the value of **Count** represent at the end of the execution?

```
1 Count = 0
2 while(Table 1 has more rows){
3     Read the first row X in Table 1
4     Move X to Table 2
5     while(Table 1 has more rows){
6         Read the first row Y in Table 1
7         Count = Count + DoSomething(X, Y)
8         Move Y to Table 3
9     }
10    Move all rows from Table 3 to Table 1
11 }
12
13 Procedure DoSomething(A, B)
14     if(A.Gender != B.Gender or A.TownCity == B.TownCity){
15         return(1)
16     }
17     else{
18         return(0)
19     }
20 End DoSomething
```

Options :

- 6406533047144. ✓ Number of pairs of students with different gender or same TownCity
- 6406533047145. ✗ Number of pairs of students with same gender or different TownCity
- 6406533047146. ✗ Number of pairs of students with the same gender and the same TownCity
- 6406533047147. ✗ The code will give an error due to incorrect return statements in lines 15 and 18

Question Number : 4 Question Id : 640653905026 Question Type : MCQ Calculator : Yes

Correct Marks : 5

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Scores" dataset. What will **cityD[k]** represent at the end of execution?

```
1 cityD = {}
2 while(Table 1 has more rows){
3     Read the first row X in Table 1
4     if(isKey(cityD, X.Town/City)){
5         if(isKey(cityD[X.Town/City], X.Gender)){
6             if(cityD[X.Town/City][X.Gender] > X.Physics){
7                 cityD[X.Town/City][X.Gender] = X.Physics
8             }
9         }
10    else{
11        cityD[X.Town/City][X.Gender] = X.Physics
12    }
13 }
14 else{
15     cityD[X.Town/City] = {}
16     cityD[X.Town/City][X.Gender] = X.Physics
17 }
18 Move X to Table 2
19 }
```

Options :

- 6406533047156. ❌ A dictionary with gender as key mapped to the Physics marks
- 6406533047157. ❌ A dictionary with gender as key mapped to the highest Physics marks scored by that gender in city **k**
- 6406533047158. ✓ A dictionary with gender as key mapped to the lowest Physics marks scored by that gender in city **k**
- 6406533047159. ❌ A dictionary with cities as keys mapped to the Physics marks

Question Number : 5 Question Id : 640653905027 Question Type : MCQ Calculator : Yes

Correct Marks : 5

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Scores" dataset. What will $\text{first}(D[i]) - \text{last}(D[i])$ represent for a given key i ?

```
1 | D = {}
2 | while(Table 1 has more rows){
3 |   Read the first row X in Table 1
4 |   if(isKey(D, X.TownCity)){
5 |     if(first(D[X.TownCity]) < X.Mathematics){
6 |       D[X.TownCity] = [X.Mathematics, last(D[X.TownCity])]
7 |     }
8 |     if(last(D[X.TownCity]) > X.Mathematics){
9 |       D[X.TownCity] = [first(D[X.TownCity]), X.Mathematics]
10 |
11 }
12 }
13 else{
14   D[X.TownCity] = [X.Mathematics, X.Mathematics]
15 }
16 Move X to Table 2
17 }
```

Options :

6406533047160. ✓ The difference between highest and lowest Mathematics marks of the city i
6406533047161. ✗ The difference between overall highest and lowest Mathematics marks of the dataset
6406533047162. ✗ The difference between highest and second highest Mathematics marks of the city i
6406533047163. ✗ It will be always 0

Sub-Section Number :

3

Sub-Section Id :

640653134277

Question Shuffling Allowed :

Yes

Question Number : 6 Question Id : 640653905024 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following procedure, where **L1** and **L2** are two non-empty lists.

```
1 Procedure findsomething(L1, L2)
2     if(length(L1) != length(L2)){
3         return(False)
4     }
5     while(length(L1) > 0){
6         if(last(L1) != last(L2)){
7             return(False)
8         }
9         L1 = init(L1)
10        L2 = init(L2)
11    }
12    return(True)
13 End findsomething
```

When will **findSomething(L1, L2)** return True?

Options :

6406533047148. ✘ all the elements of both lists **L1** and **L2** are same but arranged in the reverse order.

6406533047149. ✓ all the elements of both lists **L1** and **L2** are same and are arranged in the same order.

6406533047150. ✘ all the elements of list **L1** are present in **L2** where **length(L2) > length(L1)**.

6406533047151. ✘ all the elements of list **L2** are present in **L1** where **length(L1) > length(L2)**.

Sub-Section Number :

4

Sub-Section Id :

640653134278

Question Shuffling Allowed :

Yes

Question Number : 7 Question Id : 640653905025 Question Type : MCQ Calculator : Yes

Correct Marks : 6

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Words" dataset. What will **wordCount** represent at the end of the execution?

```
1 wordCount = 0
2 while(Table 1 has more rows){
3     Read the first row X in Table 1
4     if(checksomething(X) == 1){
5         wordCount = wordCount + 1
6     }
7     Move X to Table 2
8 }
9
10 Procedure checksomething(Y)
11     i = 1, C = 0
12     A = False, B = False
13     while(i <= Y.LetterCount){
14         if(ith letter of Y.Word is vowel){
15             if(A and not B){
16                 C = 1
17             }
18             A = True, B = False
19         }
20         else{
21             if(not A and B){
22                 C = 1
23             }
24             A = False, B = True
25         }
26         i = i + 1
27     }
28     return(C)
29 End checksomething
```

Options :

6406533047152. ❌ Number of words in which vowels occur consecutively

6406533047153. ❌ Number of words in which no two vowels occur consecutively

6406533047154. ✓ Number of words in which either vowels or consonants occur consecutively

6406533047155. ❌ Number of words in which no two vowels and no two consonants occur consecutively

Sub-Section Number :

5

Sub-Section Id :

640653134279

Question Shuffling Allowed :

Yes

Question Number : 8 Question Id : 640653905028 Question Type : MSQ Calculator : Yes

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following pseudocode. At the end of the execution of the following pseudocode, if **flag** has value True, then choose the possible values of list **L** from the given choices.

```
1 flag = False
2 position = 0
3 foreach element in L{
4     if((position == 1) and (element == 'x')){
5         flag = True
6     }
7     position = position + 1
8 }
```

Options :

6406533047164. ❌ ['z', 'y']

6406533047165. ✓ ['y', 'x', 'z']

6406533047166. ❌ ['x', 'y']

6406533047167. ✓ ['z', 'x', 'y']

Sub-Section Number :

6

Sub-Section Id :

640653134280

Question Shuffling Allowed :

Yes

Question Number : 9 Question Id : 640653905029 Question Type : MSQ Calculator : Yes

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the procedure given below, where **aList** is a non-empty list of positive numbers.

```
1 procedure cumulative(aList)
2     sum = 0, cumuList = []
3     foreach element in aList{
4         sum = sum + element
5         cumuList = cumuList ++ [sum]
6     }
7     return(cumuList)
8 end cumulative
```

At the end of the execution, which of the following option(s) would be correct? It is a Multiple Select Question (MSQ).

Options :

6406533047168. ✓ The first element of both the lists, **cumuList** and **aList**, will be same.

6406533047169. ❌ Number of elements in **cumuList** will be one lesser than that of **aList**.

6406533047170. ✓ **cumuList** is a list of numbers in increasing order.

6406533047171. ❌ Number of elements in both lists, **cumuList** and **aList**, will be different.

Sub-Section Number :

7

Sub-Section Id :

640653134281

Question Shuffling Allowed :

Yes

Question Number : 10 Question Id : 640653905030 Question Type : MSQ Calculator : Yes

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

For the 'Words' dataset, consider a scenario where we want to find the number of sentences containing at least 10 distinct letters. We asked ChatGPT to generate the pseudocode for this task. Below are the two pseudocodes provided by ChatGPT.

Pseudocode 1 :

```
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
```

Pseudocode 2 :

```
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 and length(L) >= 10){
7         count = count + 1
8         L = []
9     }
10    Move X to Table 2
11 }
12
13 Procedure addSomething(M, Y)
14     i = 1
15     while(i <= Y.LetterCount){
16         p = ith letter of Y.word
17         if(not (member(M, p))){
18             M = M ++ [p]
19         }
20         i = i + 1
21     }
22     return(M)
23 End addSomething
```

Which of the following statements is/are correct? It is a Multiple Select Question (MSQ).

Options :

6406533047172. ❌ Both **Pseudocode 1** and **Pseudocode 2** will give the same required output.

6406533047173. ✓ **Pseudocode 1** produces the desired output, while **Pseudocode 2** does not.

6406533047174. ❌ **Pseudocode 2** produces the desired output, while **Pseudocode 1** does not.

6406533047175. ❌ Both **Pseudocode 1** and **Pseudocode 2** will not give the required output.

For **Pseudocode 1**, if any sentence contains less than 10 distinct integers, List L will not be reinitialized to `[]`.

6406533047176. ❌ For **Pseudocode 2**, if any sentence contains less than 10 distinct integers, List L will not be reinitialized to `[]`.

Question Number : 11 Question Id : 640653905031 Question Type : MSQ Calculator : Yes

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

The following pseudocode is executed using the "Library" dataset. At the end of the execution, A stores a dictionary with the author's name as key and the number of books written by him/her as its value. But the code may have mistakes. Identify all such mistakes (if any). Assume that all statements not listed in the options below are free of errors.

```
1 A = []
2 while(Table 1 has more rows){
3     Read the first row X from Table 1
4     if(not isKey(A, X.Author)){
5         A[X.Author] = A[X.Author] + 1
6     }
7     else{
8         A[X.Author] = 1
9     }
10    Move X to Table 2
11 }
```

Options :

Replacing the condition given in line 4 with the statement given below will provide the correct result.

```
1 | if(isKey(A, X.Author))
```

6406533047178. ✓

Replacing the statements given from line 4 to 9 with the statements given below will provide the correct result.

```
1 | if(not isKey(A, X.Author)){
2     A[X.Author] = 0
3 }
4 A[X.Author] = A[X.Author] + 1
```

6406533047179. ✓

6406533047180. ✓ Interchanging Line 5 and 8 will provide the correct result.

Replacing the statements given from line 4 to 9 with the statements given below will provide the correct result.

```
1 if(not isKey(A, X.Author)){  
2     A[X.Author] = 0  
3 }  
4 else{  
5     A[X.Author] = A[X.Author] + 1  
6 }  
7
```

6406533047181. ✘

Question Number : 12 Question Id : 640653905032 Question Type : MSQ Calculator : Yes

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

The given pseudocode is executed using the "Words" dataset. At the end of execution **A** captures the frequency count of the most frequent vowel in the dataset. But the pseudocode may have mistakes. Identify all such mistakes (if any). Assume that all statements not listed in the options below are free of errors. It is a Multiple Select Question (MSQ).

```
1 D = { }, A = 0
2 while(Table 1 has more rows){
3     Read the first row X in Table 1
4     D = updateDictionary(D, X)
5     Move X to Table 2
6 }
7 foreach C in keys(D){
8     if(C is a vowel and D[C] < A){
9         A = D[C]
10    }
11 }
12 Procedure updateDictionary(D, Y)
13     i = 1
14     while(i ≤ Y.LetterCount){
15         B = ith letter in Y.Word
16         if(not isKey(D, B)){
17             D[B] = D[B] + 1
18         }
19         else{
20             D[B] = 1
21         }
22         i = i + 1
23     }
24     return(D)
25 End updateDictionary
```

Options :

6406533047182. ❌ Line 1: Incorrect initialization of **D**

6406533047183. ✓ Line 8: Incorrect conditional expression

6406533047184. ❌ Line 9: **A** updated with wrong value

6406533047185. ❌ Line 13: Incorrect initialization of **i**

6406533047186. ✓ Line 16: Conditional expression should not use "**not**" operator

6406533047187. ❌ Line 22: **i** updated at wrong place

Sub-Section Id :

640653134282

Question Shuffling Allowed :

Yes

Question Number : 13 Question Id : 640653905033 Question Type : SA Calculator : None

Correct Marks : 5

Question Label : Short Answer Question

What will the value of **S** be at the end of the execution of the following pseudocode?

```
1 L1 = [1, -1, 5]
2 L2 = [3, 1, 2]
3 S = dosomething(L1, L2) - dosomething(L2, L1)
4
5 Procedure dosomething(X, Y)
6     if(length(X) != length(Y)){
7         return(0)
8     }
9     if(length(X) == 1 and length(Y) == 1){
10        return(first(X) * first(Y))
11    }
12    return(first(X) * last(Y) + dosomething(rest(X), init(Y)))
13 End dosomething
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 14 Question Id : 640653905034 Question Type : SA Calculator : None

Correct Marks : 5

Question Label : Short Answer Question

The given pseudocode is executed using a dataset having the same fields as the "Words" dataset, and contains the following words:

"I ordered this product from Gitark. I am very happy to share my review regarding this awesome product. It is not only nice to use, but also has a very cool look. I think this is the best and the most awesome product which can be bought in this price range."

Consider the following information:

1. **unique(L)** returns a list of unique elements of list **L**. For example **unique(["think", "like", "toppers", "think"])** will return **["think", "like", "toppers"]**.
2. **comNo(L1, L2)** returns the number of common elements in lists **L1** and **L2**.
3. Ignore the upper and lower case, and punctuation symbols while comparing with other words.

```
1 positiveList = ["happy", "awesome", "nice", "fine", "best", "cool"]
2 posSen = 0, L = []
3 while(Table 1 has more rows){
4     Read the first row X in Table 1
5     L = L ++ [x.word]
6     if(x.word ends with full stop){
7         L = unique(L)
8         posCount = comNo(positiveList, L)
9         if(posCount >= 2){
10             posSen = posSen + 1
11         }
12         L = []
13     }
14     Move X to Table 2
15 }
```

What will the value of **posSen** be at the end of the execution of the above pseudocode?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Sub-Section Number : 9

Sub-Section Id : 640653134283

Question Shuffling Allowed : No

Question Id : 640653905035 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix **Calculator :** None

Question Numbers : (15 to 16)

Question Label : Comprehension

Let **a** and **b** be positive integers. Procedure **remainder(a, b)** returns remainder if **a** is divided by **b**.

```
1 Procedure doSomething(x)
2     j = 2, Flag = True
3     if(x == 1){
4         return(False)
5     }
6     while(j < x){
7         if(remainder(x, j) == 0){
8             Flag = False
9             exitloop
10        }
11        j = j + 1
12    }
13    return(Flag)
14 End doSomething
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 15 Question Id : 640653905036 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

When will procedure **doSomething(X)** return True?

Options :

6406533047190. ✓ X is a prime number

6406533047191. ✗ X is an even number

6406533047192. ✗ X is an odd number

6406533047193. ✗ X is more than 1

Question Number : 16 Question Id : 640653905037 Question Type : MCQ Calculator : Yes

Correct Marks : 5

Question Label : Multiple Choice Question

Consider the procedure discussed above. What will the value of M be at the end of the execution of the given pseudocode below?

```
1 | L = [8, 12, 13, 23, 11, 40]
2 | M = []
3 | position = 1
4 | foreach element in L{
5 |     if(dosomething(position) and dosomething(element)){
6 |         M = M ++ [element]
7 |     }
8 |     position = position + 1
9 | }
```

Options :

640653047194. ✓ M = [13, 11]

640653047195. ✗ M = [13, 23, 11]

640653047196. ✗ M = [11, 23]

640653047197. ✗ M = [13, 23]

Question Id : 640653905044 Question Type : COMPREHENSION Sub Question Shuffling

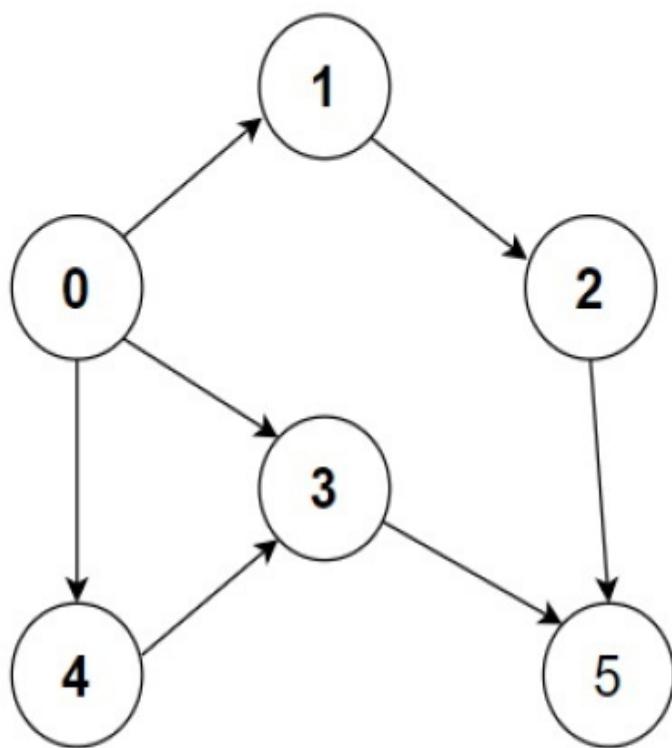
Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (17 to 18)

Question Label : Comprehension

Let M be the adjacency matrix of the graph G as shown below and consider the procedure **Dosomething** given below.



```
1 Procedure Dosomething(M, q)
2     count = 0
3     foreach i in rows(M){
4         if(M[i][q] == 1 or M[q][i] == 1){
5             count = count + 1
6         }
7     }
8     return(count)
9 End Dosomething
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 17 Question Id : 640653905045 Question Type : SA Calculator : None

Correct Marks : 5

Question Label : Short Answer Question

What will the value of B be at the end of the execution of the pseudocode given below?

```
1 | B = Dosomething(M, 3)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 18 Question Id : 640653905046 Question Type : SA Calculator : None

Correct Marks : 4

Question Label : Short Answer Question

What will the value of **B** be at the end of execution of pseudocode given below?

```
1 | B = Dosomething(M, 4)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number : 10

Sub-Section Id : 640653134284

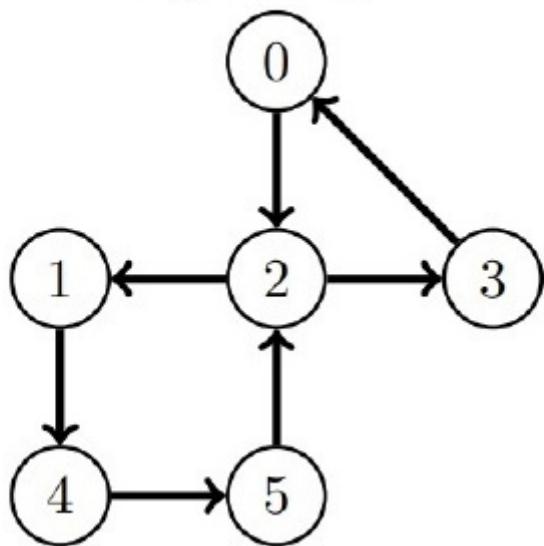
Question Shuffling Allowed : No

Question Id : 640653905038 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (19 to 20)

Question Label : Comprehension

Let M be an adjacency matrix of a graph G given below, where $M[i][j] = 1$ if there is an edge from i to j , otherwise 0.



```
1 Procedure updateMatrix(M)
2     tempMat = M
3     foreach i in rows(M){
4         foreach k in columns(M){
5             if(M[i][k] == 1){
6                 foreach j in columns(M){
7                     if(M[k][j] == 1){
8                         tempMat[i][j] = 1
9                     }
10                }
11            }
12        }
13    }
14    return(tempMat)
15 End updateMatrix
```

Based on above information, answer the given subquestions

Sub questions

Question Number : 19 Question Id : 640653905039 Question Type : MCQ Calculator : Yes

Correct Marks : 5

Question Label : Multiple Choice Question

What will the values of p and q be at the end of execution of pseudocode given below?

```
1 newMatrix = updateMatrix(M)
2 p = newMatrix[0][3]
3 q = newMatrix[3][4]
```

Options :

640653047198. * $p = 0, q = 0$

6406533047199. ✓ p = 1, q = 0

6406533047200. ✗ p = 0, q = 1

6406533047201. ✗ p = 1, q = 1

Question Number : 20 Question Id : 640653905040 Question Type : MCQ Calculator : Yes

Correct Marks : 5

Question Label : Multiple Choice Question

What will the values of **p** and **q** be at the end of execution of pseudocode given below?

```
1 newMatrix1 = updateMatrix(M)
2 newMatrix2 = updateMatrix(newMatrix1)
3 p = newMatrix2[0][3]
4 q = newMatrix2[3][4]
```

Options :

6406533047202. ✗ p = 0, q = 0

6406533047203. ✗ p = 1, q = 0

6406533047204. ✗ p = 0, q = 1

6406533047205. ✓ p = 1, q = 1

Question Id : 640653905041 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (21 to 22)

Question Label : Comprehension

The following pseudocode constructs a graph G using the "Scores" dataset, represented by the adjacency matrix **B**. Let **A** be a dictionary with sequence numbers of students as keys mapped to their total marks.

```
1 n = length(keys(A))
2 B = createMatrix(n, n)
3
4 foreach i in keys(A){
5     foreach j in keys(A){
6         if(A[i] > A[j]){
7             B[i][j] = 1
8         }
9     }
10 }
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 21 Question Id : 640653905042 Question Type : MSQ Calculator : Yes

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct option(s) with respect to the graph G.

Options :

6406533047206. ✓ G is always acyclic.

6406533047207. ✗ If $B[i][j] = 1$ then $B[j][i] = 1$, for any i, j

6406533047208. ✓ If $B[i][j] = 1$ then $B[j][i] = 0$, for any i, j

6406533047209. ✗ If $B[i][j] = 0$ then $B[j][i] = 1$, for any i, j

Question Number : 22 Question Id : 640653905043 Question Type : MCQ Calculator : Yes

Correct Marks : 5

Question Label : Multiple Choice Question

When will the procedure **checkSomething(B, i)**
return True?

```
1 Procedure checksomething(B, i)
2     foreach j in columns(B){
3         if((i != j) and (B[i][j] == 0)){
4             return(False)
5         }
6     }
7     return (True)
8 End checksomething
```

Options :

6406533047210. ✗ If student i has scored greater total marks than at least one student

6406533047211. ✗ If student i has scored less total marks than at least one student

6406533047212. ✗ If student i has scored lowest total marks among all students

6406533047213. ✓ If student i has scored highest total marks among all students

Sem2 Intro to python

Section Id :	64065364160
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory

Number of Questions :	18
Number of Questions to be attempted :	18
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134285
Question Shuffling Allowed :	No

Question Number : 23 Question Id : 640653905047 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "[FOUNDATION LEVEL : SEMESTER II: INTRODUCTION TO 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 :

640653047216. ✓ YES

640653047217. ✗ NO

Question Number : 24 Question Id : 640653905048 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

Useful Data

Presentation

There are two types of blocks that you would see in all the questions:

Code

```
for i in range(10):
    if i % 2 == 0:
        print(i)
```

Input or Output

0
2
4
6
8

In both the blocks, please note that the region to the left of the thin vertical line — | — corresponds to line-numbers. Do not confuse the line numbers with the content of the code or the input-output. Just to be clear:

Line Numbers ← → Code/Input/Output

1	0
2	2
3	4
4	6
5	8

Useful information

range

Sample behaviour of the `range` function:

- `range(5)` corresponds to the sequence `0, 1, 2, 3, 4`
- `range(1, 5)` corresponds to the sequence `1, 2, 3, 4`
- `range(1, 1)` is the empty sequence

// operator

`//` is the `floor division operator`. `5 // 2` is `2` and *not* `2.5`

NAT → integer

For all NAT questions in this exam, the answer will always be an integer and not a float value.

If the answer to a question is `18`, then just enter that value. Do *not* enter `18.0`

Options :

6406533047218. ✓ Useful Data has been mentioned above.

6406533047219. ❌ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :

2

Sub-Section Id :

640653134286

Question Shuffling Allowed :

Yes

Question Number : 25 Question Id : 640653905049 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

A system categorizes people based on their age as follows:

Marks	Grade
$0 \leq Age < 13$	<i>Child</i>
$13 \leq Age < 20$	<i>Teenager</i>
$20 \leq Age < 60$	<i>Adult</i>
$Age > 60$	<i>SeniorCitizen</i>

Which of the following snippets computes and prints the category after accepting the age as input? Assume that the input entered by the user will be an integer and will lie only in the range $[0, 70]$.

Snippet-1

```
age = int(input())
if age < 13:
    category = 'Child'
elif age < 20:
    category = 'Teenager'
elif age < 60:
    category = 'Adult'
else:
    category = 'Senior Citizen'
print(category)
```

Snippet-2

```
age = int(input())
if age < 13:
    category = 'Child'
if age < 20:
    category = 'Teenager'
if age < 60:
    category = 'Adult'
else:
    category = 'Senior Citizen'
print(category)
```

Options :

6406533047220. ✓ Only snippet-1 is correct

6406533047221. ✗ Only snippet-2 is correct

6406533047222. ✗ Both snippets are correct

6406533047223. ❌ Both snippets are incorrect

Question Number : 26 Question Id : 640653905050 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the output of the following Python code?

```
string1 = 'diploma'
string2 = 'data science'
L = []
for i in range(0, len(string1)):
    for j in range(0, len(string2)):
        if (string1[i] == string2[j]):
            L.append(string1[i])
            break
        else:
            continue
print(L)
```

Options :

['d', 'i', 'a']

6406533047224. ✓

['d', 'i', 'a', 'd', 'i', 'a']

6406533047225. ❌

['d', 'd', 'i', 'i', 'a', 'a']

6406533047226. ❌

6406533047227. ❌ None of these

Question Number : 27 Question Id : 640653905051 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

`check_level` is a method of the class `Tank` that updates the attribute `fill_required` to the Boolean literal `True` if the attribute `waterlevel` is less than 50 litres, indicating that the tank needs refilling and `False` otherwise. Select the correct implementation of this method.

Options :

```
def check_level(self):
    if self.waterlevel < 50:
        self.fill_required = True
    else:
        self.fill_required = False
```

6406533047228. ✓

```
def check_level():
    if self.waterlevel < 50:
        self.fill_required = True
    else:
        self.fill_required = False
```

6406533047229. ✗

```
def check_level(self):
    if waterlevel < 50:
        self.fill_required = True
    else:
        self.fill_required = False
```

6406533047230. ✗

```
def check_level(self):
    if self.waterlevel <= 50:
        fill_required = True
    else:
        fill_required = False
```

6406533047231. ✗

Question Number : 28 Question Id : 640653905052 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following function.

```
def createList(nums):
    outlist = []

    for x in nums:
        for y in range(len(outlist)):
            outlist.append(outlist[y]+[x])

    print(outlist)
```

The output when we invoke `createList([1,2,5])` is:

Options :

6406533047232. ✘ `[]`, `[1]`, `[2]`, `[1, 2]`, `[1, 2, 5]`, `[2, 5]`, `[5]`, `[1, 5]`

6406533047233. ✘ `[]`, `[1]`, `[2]`, `[1, 2]`, `[5]`, `[1, 5]`, `[2, 5]`, `[1, 2, 5]`

6406533047234. ✘ `[[], [1], [2], [1, 2], [1, 2, 5], [2, 5], [5], [1, 5]]`

6406533047235. ✓ `[[], [1], [2], [1, 2], [5], [1, 5], [2, 5], [1, 2, 5]]`

Question Number : 29 Question Id : 640653905053 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the output of the code below.

```
def matrix_operation(matrix):
    new_matrix = []
    for j in range(len(matrix[0])):
        modified_row = []
        for i in range(len(matrix)):
            modified_row.append(matrix[i][j])
        new_matrix.append(modified_row)
    print(new_matrix)

A = [[1, 2, 3], [4, 5, 6], [7, 8, 9]]
matrix_operation(A)
```

Options :

640653047236. ✓ [[1, 4, 7], [2, 5, 8], [3, 6, 9]]

640653047237. ✗ [[1, 2, 3], [4, 5, 6], [7, 8, 9]]

640653047238. ✗ [[1, 2, 3], [7, 8, 9], [4, 5, 6]]

640653047239. ✗ [[1, 3, 2], [7, 9, 8], [4, 6, 5]]

Question Number : 30 Question Id : 640653905054 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the file `countries.txt` given below, also consider the python file both in the same directory. What will be the output of the code below?

`countries.txt`

```
IND-New Delhi-+91  
USA-Washington D.C.-+1  
RU-Moscow-+7  
CHN-Beijing-+86  
BR-Brasilia-+55
```

```
file_path = "countries.txt"  
file = open(file_path, "r")  
  
for line in file:  
    modified_line = line.strip()  
    modified_line = modified_line.split('-')  
    print(modified_line[0], "|", modified_line[2])  
  
file.close()
```

The separator used in `countries.txt` is `-` which is same as the one used in `.split()` method in python code.

Options :

```
IND-New Delhi  
USA-Washington D.C.  
RU-Moscow  
CHN-Beijing  
BR-Brasilia
```

6406533047240. ✘

6406533047241. ✘

IND | Delhi
USA | States-Washington
RU |
CHN |
BR |

IND | +91
USA | +1
RU | +7
CHN | +86
BR | +55

6406533047242. ✓

IND | New Delhi
USA | Washington D.C.
RU | Moscow
CHN | Beijing
BR | Brasilia

6406533047243. ❌

Sub-Section Number : 3
Sub-Section Id : 640653134287
Question Shuffling Allowed : Yes

Question Number : 31 Question Id : 640653905055 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Consider the Python code given below.

```
f = open('output.txt', 'w')
f.write('rose')
f.write('jasmine\n')
f.write('''lotus
lilly
orchard''')
f.close()
```

How many number of lines will be present in the file `output.txt` after the execution of the above code?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 32 **Question Id :** 640653905056 **Question Type :** SA **Calculator :** None

Correct Marks : 3

Question Label : Short Answer Question

What is the output of the following snippet of code?

```
given = '27{4517}90'
word = '' # empty string
index = 0
flag = False
while index < len(given):
    char = given[index]
    if char == '{':
        flag = True
    if flag and char not in '{}':
        word += char
    if char == '}':
        break
    index += 1

print(int(word))
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4517

Question Number : 33 **Question Id :** 640653905057 **Question Type :** SA **Calculator :** None

Correct Marks : 3

Question Label : Short Answer Question

Given below is the python code.

```
s1, s2 = set(), set()
s3 = s1

for i in range(7,10,2):
    s1.add(i)

for i in range(6,20,3):
    s2.add(i)

for i in range(18,14,-1):
    s3.add(i)

tup = tuple(s1 & s2 & s3)

print(len(tup))
```

What will be in the length of variable named `tup` .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 34 **Question Id :** 640653905058 **Question Type :** SA **Calculator :** None

Correct Marks : 3

Question Label : Short Answer Question

```
numbers = [20, 10, 9, 12, 3]

result = []

for num in numbers:
    if num % 3 == 0:
        result.append(num * num)

result.sort()

result.pop()

print(result[-1])
```

What will be the output of the snippet of code?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

81

Question Number : 35 **Question Id :** 640653905059 **Question Type :** SA **Calculator :** None

Correct Marks : 3

Question Label : Short Answer Question

Consider the following snippet of code.

```
def filter(people, age, city):
    people_list = []
    for person in people:
        if person["age"] >= age and person["city"] == city:
            people_list.append(person)
    return people_list

people = [
    {"name": "Alice", "age": 25, "city": "New York"},
    {"name": "Bob", "age": 30, "city": "Los Angeles"},
    {"name": "Charlie", "age": 20, "city": "Chicago"},
    {"name": "David", "age": 35, "city": "New York"},
    {"name": "Elsie", "age": 31, "city": "New York"}]

print(len(filter(people, 30, "New York")))
```

What will be the output of the snippet of code?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number : 4

Sub-Section Id : 640653134288

Question Shuffling Allowed : Yes

Question Number : 36 **Question Id :** 640653905060 **Question Type :** MSQ **Calculator :** Yes

Correct Marks : 3 **Max. Selectable Options :** 0

Question Label : Multiple Select Question

Consider the below snippets which are intended to create a dictionary with the elements as key and their frequency in the given list as values.

Snippet-1

```
L = ['yellow', 'indigo', 'blue', 'yellow', 'blue']  
freq = {word: L.count(word) for word in L}  
print(freq)
```

Snippet-2

```
L = ['yellow', 'indigo', 'blue', 'yellow', 'blue']  
freq = {word: count(word) for word in L}  
print(freq)
```

Choose all the correct options regarding the given code .

Options :

6406533047249. ✓ Snippet-1 is correct

6406533047250. ✗ Snippet-2 is correct

The correct snippet generates the output:

```
{['yellow': 2], ['indigo': 1], ['blue': 2]}
```

6406533047251. ✗

The correct snippet generates the output:

```
{'yellow': 2, 'indigo': 1, 'blue': 2}
```

6406533047252. ✓

Question Number : 37 Question Id : 640653905061 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select error-free implementations of a program that reads and prints `input.txt` line by line. If the file doesn't exist, the program should terminate without raising any error.

Options :

6406533047253. ✓

```
try:  
    f = open('input.txt', 'r')  
    for line in f:  
        print(line.strip())  
except FileNotFoundError:  
    print('File does not exist')
```

```
try:  
    f = open('input.txt', 'r')  
    for line in f:  
        print(line.strip())  
except:  
    print('File does not exist')
```

6406533047254. ✓

```
try:  
    f = open('input.txt', 'r')  
    for line in f:  
        print(line.strip())  
except InvalidError:  
    print('File does not exist')
```

6406533047255. ✘

```
try:  
    f = open('input.txt', 'r')  
    for line in f:  
        print(line.strip())  
except FileNotFoundError:  
    print('File does not exist')  
  
except:  
    print('This is for all other errors that might come up')
```

6406533047256. ✓

Sub-Section Number :

5

Sub-Section Id :

640653134289

Question Shuffling Allowed :

Yes

Question Number : 38 Question Id : 640653905062 Question Type : MSQ Calculator : Yes

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following python code.

```
def word_shuffle(s, t):
    if len(s) != len(t):
        return False
    dict_s = {}
    dict_t = {}

    for char in s:
        dict_s[char] = dict_s.get(char, 0) + 1

    for char in t:
        dict_t[char] = dict_t.get(char, 0) + 1

    return dict_s == dict_t
```

Each input is a word in which all the characters are in lower case. These will be set as argument when the function `word_shuffle()` is called. Select all set of arguments which will return True.

Hint:

`dict.get(key, default_value)` returns the value corresponding to the `key`, if `key` is not found then it returns the `default_value`.

Example:

```
sample_dict = {'a' : 1}
sample_dict.get('a') # returns 1
sample_dict.get('b') # returns None
sample_dict.get('b',0) # retuns 0
```

Options :

640653047257. ❌ "rat", "cat"

640653047258. ✓ "listen", "silent"

6406533047259. ✓ "race", "care"

6406533047260. ✘ "train", "intro"

Sub-Section Number : 6

Sub-Section Id : 640653134290

Question Shuffling Allowed : No

Question Id : 640653905063 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (39 to 40)

Question Label : Comprehension

Consider the class `Player` :

```
class Player:  
    def __init__(self, name, score):  
        self.name = name  
        self.score = score  
  
    def change_score(self, new_score):  
        self.score = new_score  
  
    def print_info(self):  
        print(f'Player name: {self.name}')  
        print(f'Player score: {self.score}')
```

`Captain` is a sub-class of `Player`:

```
class Captain(Player):  
    count = 0  
  
    def __init__(self, name, score, game_type):  
        super().__init__(name, score)  
        self.game_type = game_type  
        Captain.count += 1  
  
    def is_Cricket(self):  
        return self.game_type == 'Cricket'  
  
    def print_info(self):  
        super().print_info()  
        print('Player is a Captain')  
        print(f'Game type: {self.game_type}')
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 39 Question Id : 640653905064 Question Type : MCQ Calculator : Yes

Correct Marks : 1.5

Question Label : Multiple Choice Question

What is the output of the following snippet of code?

```
capt = Captain('Ronaldo', 708, 'Football')
capt.change_score(800)
capt.print_info()
```

Options :

Player name: Ronaldo
Player score: 800

6406533047261. ✘

Player is a Captain
Game type: Football

6406533047262. ✘

Player name: Ronaldo
Player score: 708
Player is a Captain
Game type: Football

6406533047263. ✘

Player name: Ronaldo
Player score: 800
Player is a Captain
Game type: Football

6406533047264. ✓

Question Number : 40 Question Id : 640653905065 Question Type : SA Calculator : None

Correct Marks : 1.5

Question Label : Short Answer Question

`matches` represents a list of objects of type `Captain`. What is the output of the following snippet of code?

```
Captain.count = 0
matches = [Captain('Ali', 678, 'Football'),
           Captain('Sachin', 128, 'Cricket'),
           Captain('Madonna', 134, 'Football'),
           Captain('Dhoni', 120, 'Cricket')]
count = 0

for c in matches:
    if c.is_Cricket():
        count = count + 1
print(count)
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number : 7

Sub-Section Id : 640653134291

Question Shuffling Allowed : No

Question Id : 640653905066 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix
Calculator : None

Question Numbers : (41 to 43)

Question Label : Comprehension

Execute the following snippet of code and answer the given sub-questions

```
li = ['valorant', 'apex', 'cod']

def count(s):
    n = 0
    for char in s:
        if char in 'aeiou':
            n += 1
    return {s : n}

def recursiveFunc(n):
    if n <= 0:
        print("Blastoff!")
    else:
        print(n)
        elem = li.pop(0)
        li.append(count(elem))
        recursiveFunc(n - 1)

recursiveFunc(3)
```

Sub questions

Question Number : 41 Question Id : 640653905067 Question Type : MCQ Calculator : Yes

Correct Marks : 1.5

Question Label : Multiple Choice Question

What will be printed when the code
is run?

Options :

- 3
- 2
- 1

6406533047266. ✘

6406533047267. ✓

3
2
1
Blastoff!

Blastoff!

1
2
3

6406533047268. ✘

3
2
1
Blastoff!
Blastoff!

6406533047269. ✘

Question Number : 42 Question Id : 640653905068 Question Type : MCQ Calculator : Yes

Correct Marks : 1.5

Question Label : Multiple Choice Question

What will be the value of `li`
at the end of execution?

Options :

6406533047270. ✘ `['valorant', 'apex', 'cod']`

6406533047271. ✘ `['cod', 'apex', 'valorant']`

6406533047272. ✘ `[{'cod': 1}, {'apex': 2}, {'valorant': 3}]`

6406533047273. ✓ `[{'valorant': 3}, {'apex': 2}, {'cod': 1}]`

Question Number : 43 Question Id : 640653905069 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

For which argument will the function

`recursiveFunc()` cause an error?

Options :

6406533047274. ✘ `recursiveFunc(1)`

6406533047275. ✘ `recursiveFunc(-1)`

6406533047276. ✓ `recursiveFunc(5)`

6406533047277. ✘ `recursiveFunc(0)`

Sem1 Maths1

Section Id :	64065364161
Section Number :	3
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134292
Question Shuffling Allowed :	No

Question Number : 44 Question Id : 640653905070 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : SEMESTER I: 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 :

6406533047278. ✓ YES

6406533047279. ✗ NO

Question Number : 45 Question Id : 640653905071 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

Instructions:

- There are some questions that have functions with discrete-valued domains (such as day, month, year etc).
- For NAT-type questions, enter only one right answer even if you get multiple answers for that particular question.
- Notations:
 - \mathbb{R} = Set of real numbers
 - \mathbb{Q} = Set of rational numbers
 - \mathbb{Z} = Set of integers
 - \mathbb{N} = Set of natural numbers
- The set of natural numbers includes 0.

Options :

6406533047280. ✓ Instructions has been mentioned above.

6406533047281. ✗ This Instructions is just for a reference & not for an evaluation.

Sub-Section Number :	2
Sub-Section Id :	640653134293
Question Shuffling Allowed :	Yes

Question Number : 46 Question Id : 640653905072 Question Type : MSQ Calculator : Yes

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is (are) correct?

Options :

6406533047282. ✓ Floyd-Warshall algorithm is used for all pair shortest paths.

6406533047283. ✓ The Shortest path problem is not applicable to a graph with a negative weight

cycle.

640653047284. ✓ Bellman-Ford algorithm is used for single source shortest path.

640653047285. ✗ Dijkstra's algorithm is used for all pair shortest paths.

Sub-Section Number : 3

Sub-Section Id : 640653134294

Question Shuffling Allowed : Yes

Question Number : 47 Question Id : 640653905073 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following adjacency matrix

$$\begin{array}{c|ccccc} & A & B & C & D & E \\ \hline A & 0 & 1 & 0 & 1 & 1 \\ B & 1 & 0 & 1 & 0 & 1 \\ C & 0 & 1 & 0 & 0 & 1 \\ D & 1 & 0 & 0 & 0 & 1 \\ E & 1 & 1 & 1 & 1 & 0 \end{array}$$

which represents graph G which has 5 vertices A, B, C, D and E .

Which of the following is true about the graph G ?

Options :

640653047286. ✗ The number of vertices in G of degree 3 are 3.

640653047287. ✓ The total number of edges in G are 7.

640653047288. ✗ The total number of edges in G are 14.

640653047289. ✓ There is a cycle in G .

Question Number : 48 Question Id : 640653905082 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following function:

$$f(x) = \begin{cases} \frac{x}{(x+1)(x+2)}, & x \geq 1, \\ \frac{1}{x-5}, & x < 1 \end{cases}$$

Which of the following options is (are) correct?

Options :

640653047302. ✗ $\lim_{x \rightarrow -2^+} f(x) = \infty$

640653047303. ✗

The function f is continuous.

6406533047304. ✓ $\lim_{x \rightarrow 5^+} f(x) = \lim_{x \rightarrow 5^-} f(x) = \frac{5}{42}$

6406533047305. ✓ At $x = 1$, the function f is discontinuous.

Question Number : 49 Question Id : 640653905083 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true about the function $f(x) = x^2 + 2x - 8$?

Options :

6406533047306. ✗ f is one-one on its domain.

6406533047307. ✗ f has an inverse on its domain.

6406533047308. ✓ The vertex of this parabola is at (-1, -9).

6406533047309. ✓ y - intercept of the given parabola is -8.

Question Number : 50 Question Id : 640653905086 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following relations defined on the set of integers

- $R_1 = \{(x, y) | x, y \in \mathbb{Z} \text{ and } 7 \text{ divides } (x - y)\}$
- $R_2 = \{(x, y) | x, y \in \mathbb{Z} \text{ and } x + y = 2\}$

Choose the correct option(s).

Options :

6406533047318. ✗ R_1 is not transitive.

6406533047319. ✓ R_2 is symmetric.

6406533047320. ✓ R_1 is symmetric.

6406533047321. ✗ R_2 is transitive.

Sub-Section Number :

4

Sub-Section Id :

640653134295

Question Shuffling Allowed :

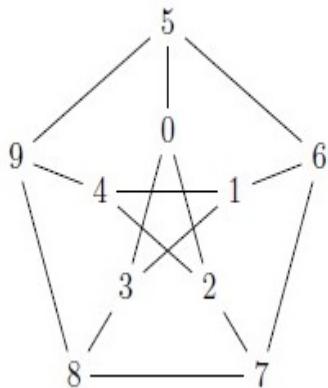
Yes

Question Number : 51 Question Id : 640653905074 Question Type : SA Calculator : None

Correct Marks : 4

Question Label : Short Answer Question

What is the minimum number of colours required to colour the graph given below?



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 52 **Question Id :** 640653905088 **Question Type :** SA **Calculator :** None

Correct Marks : 4

Question Label : Short Answer Question

You have been closely monitoring your bike's mileage recently. Here is a table showing two rows representing the amount paid for fuel(in ₹) and the corresponding mileage (in Km). Consider y as the amount paid and x as the corresponding mileage in Km. You have noted down the distance traveled each time when the fuel meter falls back to a fixed reference mark and predicted that the equation of the best fit line is $y = 5x - 21$. What will be the value of SSE w.r.t the best fit line?

Amount paid (in ₹)	80	50	60	100	48
Distance (in Km)	20	15	16	25	14

Table: 1

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

35

Sub-Section Number :

5

Sub-Section Id :

640653134296

Question Shuffling Allowed :

No

Question Id : 640653905075 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (53 to 54)

Question Label : Comprehension

Consider a weighted graph G with 7 vertices { rows and columns are in the order $V_1, V_2, V_3, V_4, V_5, V_6, V_7$ }, which is represented by the following adjacency matrix.

Use the following information for given sub-questions

$$\begin{bmatrix} 0 & 24 & 0 & 0 & 36 & 0 & 28 \\ 24 & 0 & 0 & 32 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 4 & 12 \\ 0 & 32 & 0 & 0 & 8 & 0 & 0 \\ 36 & 0 & 0 & 8 & 0 & 0 & 0 \\ 0 & 0 & 4 & 0 & 0 & 0 & 20 \\ 28 & 0 & 12 & 0 & 0 & 20 & 0 \end{bmatrix}.$$

Sub questions

Question Number : 53 Question Id : 640653905076 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Suppose we perform Prim's algorithm on the graph G starting from vertex V_1 to find an MCST. Then the order in which the vertices are added is

Options :

6406533047291. ✘ $V_1, V_3, V_6, V_7, V_2, V_4, V_5$

6406533047292. ✓ $V_1, V_2, V_7, V_3, V_6, V_4, V_5$

6406533047293. ✘ $V_1, V_2, V_4, V_5, V_7, V_3, V_6$

6406533047294. ✘ $V_1, V_3, V_6, V_7, V_5, V_4, V_2$

Question Number : 54 Question Id : 640653905077 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

Find the value MCST.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

108

Sub-Section Number : 6

Sub-Section Id : 640653134297

Question Shuffling Allowed : No

Question Id : 640653905079 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix **Calculator :** None

Question Numbers : (55 to 56)

Question Label : Comprehension

Consider the following functions;

- $v(t) = 4t^2 + 2t$
- $s(t) = 20 + 4t - t^2$

Let $[.]$ be the floor function (greatest integer function), e.g., $[2.34] = 2$, $[5] = 5$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 55 **Question Id :** 640653905080 **Question Type :** SA **Calculator :** None

Correct Marks : 3

Question Label : Short Answer Question

If A and B are the areas under
the curves $v(t)$ and $s(t)$
respectively, from $t = 0$ to $t = 1$
then what is the value of $[A] + [B]$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

23

Question Number : 56 **Question Id :** 640653905081 **Question Type :** SA **Calculator :** None

Correct Marks : 2

Question Label : Short Answer Question

If α and β are the Y -coordinates of the points of intersection of the curves $v(t)$ and $s(t)$ then what is the value of $10(\alpha + \beta)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Sub-Section Number : 7

Sub-Section Id : 640653134298

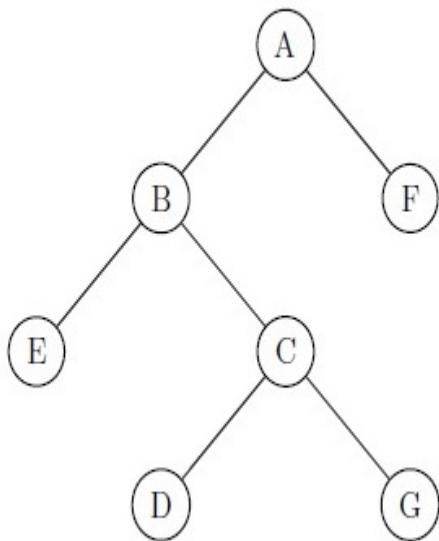
Question Shuffling Allowed : Yes

Question Number : 57 **Question Id :** 640653905078 **Question Type :** MCQ **Calculator :** Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Suppose we obtain the following BFS tree rooted at node A for an undirected graph with vertices $\{A, B, C, D, E, F, G\}$.



Which of the following cannot be an edge in the original graph?

Options :

6406533047296. ✓ (A,D)

6406533047297. ✗ (E,C)

6406533047298. ✗ (D,G)

6406533047299. ✗ (B,F)

Question Number : 58 Question Id : 640653905084 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Choose the correct option(s).

Options :

6406533047310. ✓ $\lim_{x \rightarrow 0} [x \times \sin(\frac{1}{x})] = 0$

6406533047311. ✗ $\lim_{x \rightarrow 0} \frac{e^{(1/x)}}{e^{(1/x)} + 1} = 0$

6406533047312. ✗ $\lim_{x \rightarrow 0} [x \times \sin(\frac{1}{x})] = 1$

6406533047313. ✗ $\lim_{x \rightarrow 0} \frac{e^{(1/x)}}{e^{(1/x)} + 1} = 1$

Sub-Section Number : 8

Sub-Section Id : 640653134299

Question Shuffling Allowed : Yes

Question Number : 59 Question Id : 640653905087 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Points $A(4, 3)$, $B(-3, -4)$ and $C(m, n)$ are collinear. If points $D(-1, 2)$, $E(5, -4)$ and C are also collinear, the value of $\frac{4m + 9n}{2m + 3n}$ is.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number : 9

Sub-Section Id : 640653134300

Question Shuffling Allowed : Yes

Question Number : 60 Question Id : 640653905085 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the functions $f(x) = \sqrt{x+4}$ and $g(x) = \log(1+x^2)$. Which of the following options is/are true?

Options :

6406533047314. ✘ $(f \circ g)(x) = \log(2x+5)$ on its domain of definition.

6406533047315. ✘ The domain of the function $(g \circ f)(x)$ is $(-5, \infty)$.

6406533047316. ✘ The domain of the function $(g \circ f)(x)$ is $[-6, -1]$.

6406533047317. ✓ $(g \circ f)(x) = \log(x+5)$ on its domain of definition.

Sub-Section Number :

10

Sub-Section Id :

640653134301

Question Shuffling Allowed :

Yes

Question Number : 61 Question Id : 640653905089 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider two polynomials $p(x) = -x^5 + 5x^4 - 7x - 2$ and $q(x) = -x^5 + 5x^4 - x^2 - 2$. Which of the following options is/are true?

Options :

6406533047324. ✓ $p(x)$ and $q(x)$ intersect at two points.

6406533047325. ✘ $p(x) \rightarrow \infty$ as $x \rightarrow \infty$.

6406533047326. ✘ $p(x)$ has 5 turning points.

6406533047327. ✓ $q(x) \rightarrow -\infty$ as $x \rightarrow \infty$.

Sem1 Statistics1

Section Id :	64065364162
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory

Number of Questions :	18
Number of Questions to be attempted :	18
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134302
Question Shuffling Allowed :	No

Question Number : 62 Question Id : 640653905090 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : SEMESTER I: 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 :

640653047328. ✓ YES

640653047329. ✗ NO

Question Number : 63 Question Id : 640653905091 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

1. Sample mean $\bar{x} = \frac{\sum_{i=1}^n x_i}{n}$, where n is the sample size.
2. Population mean $\mu = \frac{\sum_{i=1}^N x_i}{N}$, where N is the population size.
3. Sample variance $(s_x^2) = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}$
4. Population variance $(\sigma^2) = \frac{\sum_{i=1}^N (x_i - \mu)^2}{N}$
5. Sample Covariance : $Cov(x, y) = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{n - 1}$
6. Population Covariance : $Cov(x, y) = \frac{\sum_{i=1}^N (x_i - \mu)(y_i - \mu)}{N}$
7. Correlation coefficient : $r = \frac{Cov(x, y)}{s_x s_y}$
8. If an action A can occur in n_1 different ways, another action B can occur in n_2 different ways, then the total number of occurrence of the actions A or B is $n_1 + n_2$.
9. If an action A can occur in n_1 different ways, another action B can occur in n_2 different ways, then the total number of occurrence of the actions A and B is $n_1 \times n_2$.
10. $n! = n \times (n - 1) \times (n - 2) \times \dots \times 3 \times 2 \times 1$
11. ${}^n P_r = \frac{n!}{(n - r)!}$
12. The number of permutations of n objects where p_1 is of one kind, p_2 is of second kind, and so on p_k of k^{th} kind is given by:
$$\frac{n!}{p_1! p_2! \dots p_k!}$$
13. The number of ways n distinct objects can be arranged in a circle (clockwise and anticlockwise are different) is equal to $(n - 1)!$
14. The number of ways n distinct objects can be arranged in a circle (clockwise and anticlockwise are same) is equal to $\frac{(n - 1)!}{2}$

$$15. {}^nC_r = \frac{n!}{r!(n-r)!}$$

16. Events E_1, E_2, \dots, E_n are said to be exhaustive of a sample space when $\bigcup_{i=1}^n E_i = S$.

17. **Addition Rule of Probability:**

For any two events E_1 and E_2 , $P(E_1 \cup E_2) = P(E_1) + P(E_2) - P(E_1 \cap E_2)$.

$$18. P(E|F) = \frac{P(E \cap F)}{P(F)}; P(F) > 0$$

19. **Multiplication rule of probability:** For any two events E and F ,

$$P(E \cap F) = P(F) \times P(E|F); P(F) > 0$$

$$P(E \cap F) = P(E) \times P(F|E); P(E) > 0$$

20. **Pairwise Independent Events:** The events E_1, E_2, \dots, E_n are said to be pairwise independent if the following condition holds:

$$P(E_i \cap E_j) = P(E_i) \times P(E_j), i \neq j = 1, 2, \dots, n$$

21. **Law of total probability:**

Suppose that events F_1, F_2, \dots, F_k , are mutually exclusive and exhaustive; that is, exactly one of the events must occur. Then for any event E ,

$$P(E) = \sum_{i=1}^k P(E|F_i)P(F_i)$$

22. **Bayes' Rule:**

$$P(F_i|E) = \frac{P(E|F_i)P(F_i)}{\sum_{i=1}^k P(E|F_i)P(F_i)}$$

Discrete random variables:

Distribution	PMF ($P(X = x)$)	$E[X]$	$\text{Var}(X)$
Uniform(A) $A = \{a, a+1, \dots, b\}$	$\frac{1}{n}, \forall x$ $n = b - a + 1$ $k = a, a+1, \dots, b$	$\frac{a+b}{2}$	$\frac{n^2-1}{12}$
Bernoulli(p)	$\begin{cases} p & x = 1 \\ 1-p & x = 0 \end{cases}$	p	$p(1-p)$
Binomial(n, p)	${}^n C_x p^x (1-p)^{n-x},$ $x = 0, 1, \dots, n$	np	$np(1-p)$
HyperGeometric(n, m, N)	$\frac{{}^m C_x {}^{N-m} C_{n-x}}{{}^N C_n},$ $x \leq n, x \leq m, n - x \leq N - m$	$\frac{nm}{N}$	$n \frac{m}{N} \frac{N-m}{N} \frac{N-n}{N-1}$
Poisson(λ)	$\frac{e^{-\lambda} \lambda^x}{x!},$ $x = 0, 1, \dots, \infty$	λ	λ

Continuous random variables:

Distribution	PDF ($f_X(x)$)	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

Options :

6406533047330. ✓ Useful Data has been mentioned above.

6406533047331. ❌ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :

2

Sub-Section Id :

640653134303

Question Shuffling Allowed :

Yes

Question Number : 64 Question Id : 640653905092 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

A florist prepares bouquets for customers each day. For each bouquet, there is a 30% chance that it will include a specific rare flower. Find the probability that at most one bouquet out of five will

include this rare flower. 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 :

0.50 to 0.56

Question Number : 65 Question Id : 640653905107 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Suppose person A makes accurate predictions about the weather with a probability of $\frac{4}{7}$ and person B makes accurate predictions with a probability of $\frac{2}{3}$. If you ask both of them their predictions about tomorrow's weather, what is the probability that their predictions will be contradictory? 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 :

0.45 to 0.51

Question Number : 66 Question Id : 640653905108 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

A box contains 10 red marbles, 8 blue marbles, and 12 green marbles. If one marble is drawn at random, what is the probability that it is either red or green? 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 :

0.70 to 0.76

Question Number : 67 Question Id : 640653905109 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

There are 42 ways to fill the position of captain and a vice captain from a team of n members. What is the value of n ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Question Number : 68 **Question Id :** 640653905112 **Question Type :** SA **Calculator :** None

Correct Marks : 3

Question Label : Short Answer Question

If the mean and sample variance of the data $1, 6, 10, 14, 4, x_1, x_2$ are 7 and $53/3$ respectively, then find the value of $|x_1 - x_2|$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number : 3

Sub-Section Id : 640653134304

Question Shuffling Allowed : Yes

Question Number : 69 **Question Id :** 640653905096 **Question Type :** MCQ **Calculator :** Yes

Correct Marks : 3

Question Label : Multiple Choice Question

If $X \sim \text{Exp}(\lambda)$, then find the value of $P(X \leq 2 + x | X \geq 2)$.

Options :

6406533047335. ✘ $P(X \leq 2)$

6406533047336. ✓ $P(X \leq x)$

6406533047337. ✘ $P(X > 2)$

6406533047338. ✘ $P(X > x)$

Question Number : 70 Question Id : 640653905106 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

The probability mass function of a discrete random variable X is given by

x	1	3	5
$P(X = x)$	$1/4$	$1/2$	$1/4$

Table 2

Find the value of $E(X^2 - 1)$.

Options :

640653047355. ✘ 11

640653047356. ✓ 10

640653047357. ✘ 12

640653047358. ✘ 44

Question Number : 71 Question Id : 640653905111 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Let r be the sample correlation coefficient for the data pairs (x_i, y_i) , $i = 1, 2, \dots, n$. Then, find the sample correlation coefficient for the data pairs $(a + bx_i, c + dy_i)$, $i = 1, 2, \dots, n$, provided that b and d have the same sign.

Options :

640653047366. ✘ $(ac + bd)r$

640653047367. ✓ r

640653047368. ✘ 1

640653047369. ✘ Insufficient information

Sub-Section Number :

4

Sub-Section Id :

640653134305

Question Shuffling Allowed :

Yes

Question Number : 72 Question Id : 640653905100 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

If $X \sim \text{Normal}(\mu, \sigma^2)$, where $\mu = 80$ and $\sigma = 10$. Then $P(X > 80)$ is equal to:

Options :

6406533047341. ✓ $P(Z > 0)$, where Z is standard normal variable.

6406533047342. ✗ 0

6406533047343. ✓ 0.5

6406533047344. ✗ 1

Question Number : 73 Question Id : 640653905105 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is(are) true about CDF (cumulative distribution function)?

Options :

6406533047351. ✓ It is always a increasing or constant.

6406533047352. ✗ CDF lies between -1 to 1.

6406533047353. ✓ The probability that a random variable takes on a value less than or equal to a specified value.

6406533047354. ✗ CDF is not defined for a continuous random variable.

Question Number : 74 Question Id : 640653905110 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is(are) correct?

Options :

$$6406533047362. ✗ {}^nP_r = \frac{{}^nC_r}{r!}$$

$$6406533047363. ✓ {}^nC_r = {}^nC_{n-r}$$

6406533047364. ✗ Permutation does not consider the order of the objects, while combination does.

$$6406533047365. ✓ \frac{{}^nP_r}{{}^nC_r} = r!$$

Question Number : 75 Question Id : 640653905113 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is (are) correct?

Options :

6406533047371. ❌ The number of new car registrations each month for the past two years is a cross-sectional data.

6406533047372. ✓ The types of beverages sold in a cafe is a qualitative variable.

6406533047373. ✓ The color of a car has a nominal scale of measurement.

6406533047374. ❌ Based on a sample, it is concluded that 60% of the city's population will vote in the upcoming election comes under Descriptive Statistics.

Question Number : 76 Question Id : 640653905114 Question Type : MSQ Calculator : Yes**Correct Marks : 2 Max. Selectable Options : 0**

Question Label : Multiple Select Question

A pie chart displays the distribution of favorite sports among students as follows:

- Basketball : 25%
- Baseball : 20%
- Soccer : 30%
- Tennis : 15%
- Other : 10%

Which of the following statements is(are) true?

Options :

6406533047375. ✓ More students prefer Baseball over Tennis.

6406533047376. ❌ Basketball is the most popular sport.

6406533047377. ✓ Soccer and Tennis together account for 45% of the student's preferences.

6406533047378. ❌ Other sports are preferred by more than 10% of students.

Sub-Section Number :

5

Sub-Section Id :

640653134306

Question Shuffling Allowed :

No

Question Id : 640653905093 Question Type : COMPREHENSION Sub Question Shuffling**Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix****Calculator : None****Question Numbers : (77 to 78)**

Question Label : Comprehension

Suppose X follows Poisson distribution such that $3P(X = 2) = 6P(X = 1)$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 77 Question Id : 640653905094 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

What is the value of $E(X^2)$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

20

Question Number : 78 Question Id : 640653905095 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

Find the standard deviation of X .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number :

6

Sub-Section Id :

640653134307

Question Shuffling Allowed :

No

Question Id : 640653905097 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (79 to 80)

Question Label : Comprehension

A parking garage charges an hourly rate and the time spent by cars in the garage follows a uniform distribution between 1 hour and 5 hours.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 79 Question Id : 640653905098 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the probability that a randomly selected car will spend exactly 2 hours?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 80 **Question Id :** 640653905099 **Question Type :** SA **Calculator :** None

Correct Marks : 3

Question Label : Short Answer Question

What is the probability that a randomly selected car will spend more than 3 hours in the garage?

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

Sub-Section Number : 7

Sub-Section Id : 640653134308

Question Shuffling Allowed : No

Question Id : 640653905101 **Question Type :** COMPREHENSION **Sub Question Shuffling**

Allowed : No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix

Calculator : None

Question Numbers : (81 to 83)

Question Label : Comprehension

The probability mass function of a discrete random variable X is given by

x	0	1	2
$P(X = x)$	p	$1 - 2p$	p

Table 1

where, $0 \leq p \leq \frac{1}{2}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 81 Question Id : 640653905102 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Find the value of $\text{Var}(X)$ in terms of p .

Options :

6406533047345. ✘ p

6406533047346. ✘ $1 + 2p$

6406533047347. ✓ $2p$

6406533047348. ✘ 1

Question Number : 82 Question Id : 640653905103 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

What is the value of $E(3X + 2)$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 83 Question Id : 640653905104 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

If $p = \frac{1}{4}$, then find the value of

$P(X \leq 1)$. Enter the answer

correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Sem2 Maths2

Section Id :	64065364163
Section Number :	5
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134309
Question Shuffling Allowed :	No

Question Number : 84 Question Id : 640653905115 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : SEMESTER II: 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 :

640653047379. ✓ YES

640653047380. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653134310
Question Shuffling Allowed :	Yes

Question Number : 85 Question Id : 640653905116 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the two statements given below:

Statement-P: There exists a square matrix of order 2 such that $A^2 = 0$, $A^T = A$ and $A \neq 0$.

Statement-Q: There exists a square matrix of order 2 such that $A^2 = 0$ and $A \neq 0$.

Options :

6406533047381. ✘ Statement-P is true, but statement-Q is false.

6406533047382. ✓ Statement-P is false, but statement-Q is true.

6406533047383. ✘ Both statements are true.

6406533047384. ✘ Both statements are false.

Question Number : 86 Question Id : 640653905117 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following system of equations:

$$2x_1 - x_2 + x_3 = b_1$$

$$x_1 + x_2 - 2x_3 = b_2$$

$$-3x_2 + 5x_3 = b_3$$

Under which of the following conditions is the system consistent?

Options :

6406533047385. ✘ $b_2 = 0$

6406533047386. ✘ $b_1 = 2b_2$

6406533047387. ✓ $b_3 = b_1 - 2b_2$

6406533047388. ✘ $b_1 + b_2 + b_3 = 0$

Question Number : 87 Question Id : 640653905118 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following is an orthonormal basis for $\text{span}\{(1, 1, -1), (1, 2, 0)\}$?

Options :

6406533047389. ✓ $\left\{ \frac{1}{\sqrt{3}}(1, 1, -1), \frac{1}{\sqrt{2}}(0, 1, 1) \right\}$

6406533047390. ✘

$$\left\{ \frac{1}{\sqrt{3}}(1, 1, -1), \frac{1}{\sqrt{5}}(1, 2, 0) \right\}$$

6406533047391. ✘ $\left\{ \frac{1}{\sqrt{2}}(1, 0, 1), \frac{1}{\sqrt{2}}(-1, 0, 1) \right\}$

6406533047392. ✘ $\left\{ \frac{1}{\sqrt{2}}(0, 1, 1), \frac{1}{\sqrt{2}}(0, -1, 1) \right\}$

Sub-Section Number : 3

Sub-Section Id : 640653134311

Question Shuffling Allowed : Yes

Question Number : 88 Question Id : 640653905119 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let $S = \{u_1, u_2, u_3, u_4, u_5\}$ be a linearly independent subset of a vector space V . Select all true statements.

Options :

6406533047393. ✓ There exists a basis B for V such that $S \subseteq B$

6406533047394. ✓ $\dim(V) \geq 5$

6406533047395. ✘ $\text{span}(S) = V$

6406533047396. ✘ S is a subset of every basis B

Question Number : 89 Question Id : 640653905120 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the function f :

$$f(x, y) = \begin{cases} \frac{y^4}{x^2 + y^2}, & (x, y) \neq (0, 0) \\ 0, & (x, y) = (0, 0) \end{cases}$$

If f_x, f_y denote the partial derivatives, select all true statements from the options given below.

Options :

6406533047397. ✘ $f_x(0, 0)$ does not exist.

6406533047398. ❌ $f_y(0, 0)$ does not exist.

6406533047399. ✓ $f_x(0, 0) = 0$

6406533047400. ✓ $f_y(0, 0) = 0$

Sub-Section Number :

4

Sub-Section Id :

640653134312

Question Shuffling Allowed :

Yes

Question Number : 90 Question Id : 640653905121 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Find the dimension of the affine subspace corresponding to the set of all solutions to the following system:

$$\begin{bmatrix} 1 & 2 & 0 & 1 \\ 0 & 1 & 1 & 2 \\ 1 & 3 & 1 & 3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 91 Question Id : 640653905122 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Let $v = (\sqrt{2}, -\sqrt{2}, 6) \in \mathbb{R}^3$. (a, b, c) is the vector obtained from v after rotating the XY-plane anti-clockwise by 45° about the Z-axis. Find the value of $a+b+c$. Enter the nearest integer as your answer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8

Question Number : 92 Question Id : 640653905123 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Evaluate $\lim_{(x,y) \rightarrow (0,0)} \frac{\sin(4x^2 + 4y^2)}{x^2 + y^2}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 93 Question Id : 640653905124 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Consider the following function:

$$f(x, y) = \begin{cases} \frac{x^2 - xy}{\sqrt{x} - \sqrt{y}} & , \quad x \neq y \text{ and } x \geq 0 \text{ and } y \geq 0 \\ c & , \quad \text{otherwise} \end{cases}$$

For what value of c is the function f continuous at $(0, 0)$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 94 Question Id : 640653905125 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

If the directional derivative of $f(x, y) = x^3y + xy^2 + 8$ at the point $(1, 2)$ in the direction $\left(\frac{1}{\sqrt{2}}, \frac{-1}{\sqrt{2}}\right)$ is $\frac{p}{\sqrt{2}}$, find the value of p .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 95 **Question Id :** 640653905126 **Question Type :** SA **Calculator :** None

Correct Marks : 3

Question Label : Short Answer Question

The equation of the tangent plane to the function $f(x, y) = e^x(x + y)$ at the point $(1, 0)$ is given by $Ax + By + C = z$. Find the value of $\frac{A + B + C}{e}$.

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 : 640653134313

Question Shuffling Allowed : Yes

Question Number : 96 **Question Id :** 640653905127 **Question Type :** SA **Calculator :** None

Correct Marks : 4

Question Label : Short Answer Question

If $A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & 2 & 5 \\ -4 & 9 & 5 \end{bmatrix}$, find the determinant of $A^3 - 3A^2 + 2A$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Sub-Section Number : 6

Sub-Section Id : 640653134314

Question Shuffling Allowed :

No

Question Id : 640653905139 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (97 to 99)

Question Label : Comprehension

Consider a linear transformation $T : \mathbb{R}^3 \rightarrow \mathbb{R}^3$:

$$T(x, y, z) = (x - y + z, x + z, y - 2z)$$

Use the given standard basis for both domain and co-domain for matrix representation ,

Answer the sub-questions

Sub questions

Question Number : 97 Question Id : 640653905140 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

What is the matrix representation of T ?

Options :

6406533047425. ✓ $\begin{bmatrix} 1 & -1 & 1 \\ 1 & 0 & 1 \\ 0 & 1 & -2 \end{bmatrix}$

6406533047426. ✗ $\begin{bmatrix} 1 & 1 & 0 \\ -1 & 0 & 1 \\ 1 & 1 & -2 \end{bmatrix}$

6406533047427. ✗ $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

6406533047428. ✗ $\begin{bmatrix} 1 & 0 & 1 \\ -1 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$

Question Number : 98 Question Id : 640653905141 Question Type : MSQ Calculator : Yes

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select all true statements.

Options :

6406533047429. ✓ The kernel of T is $\{(0, 0, 0)\}$

6406533047430. ✗ The kernel of T is \mathbb{R}^3

6406533047431. ✗ The image of T is $\{(0, 0, 0)\}$

6406533047432. ✓ The image of T is \mathbb{R}^3

Question Number : 99 Question Id : 640653905142 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

T^{-1} is a linear transformation that is the inverse of T . That is, if

$T(x, y, z) = (a, b, c)$, then

$T^{-1}(a, b, c) = (x, y, z)$.

Find the matrix representation of T^{-1} ,

Options :

$$\frac{1}{2} \begin{bmatrix} 1 & 1 & 1 \\ -2 & 2 & 0 \\ -1 & 1 & -1 \end{bmatrix}$$

6406533047433. ✓

$$\frac{1}{2} \begin{bmatrix} 1 & -2 & -1 \\ 1 & 2 & 1 \\ 1 & 0 & -1 \end{bmatrix}$$

6406533047434. ✗

$$\begin{bmatrix} 1 & -1 & 1 \\ 1 & 0 & 1 \\ 0 & 1 & -2 \end{bmatrix}$$

6406533047435. ✗

$$\begin{bmatrix} -1 & -1 & 1 \\ -1 & 0 & 1 \\ 2 & 1 & -1 \end{bmatrix}$$

6406533047436. ✗

Sub-Section Number :

7

Sub-Section Id :

640653134315

Question Shuffling Allowed :

No

Question Id : 640653905128 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (100 to 101)

Question Label : Comprehension

Let $f : D \rightarrow \mathbb{R}$ be defined as follows:

$$f(x, y) = \sqrt{1 - x^2 - y^2}$$

where $D \subset \mathbb{R}^2$ is the domain of f .

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 100 Question Id : 640653905129 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

Choose the largest possible D that would be a valid domain from the options given below.

Options :

6406533047408. ✘ \mathbb{R}^2

6406533047409. ✘ $\{(x, y) : |x| \leq 1 \text{ and } |y| \leq 1; x, y \in \mathbb{R}\}$

6406533047410. ✘ $\mathbb{R}^2 \setminus \{(x, y) : x^2 + y^2 < 1; x, y \in \mathbb{R}\}$

6406533047411. ✘ $\mathbb{R}^2 \setminus \{(x, y) : x^2 + y^2 \leq 1; x, y \in \mathbb{R}\}$

6406533047412. ✓ $\{(x, y) : x^2 + y^2 \leq 1; x, y \in \mathbb{R}\}$

Question Number : 101 Question Id : 640653905130 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following is the range of f using the domain chosen from the previous question? Recall that $[a, b] = \{x : a \leq x \leq b; x \in \mathbb{R}\}$

Options :

6406533047413. ✓ $[0, 1]$

6406533047414. ✘ $[-1, 1]$

6406533047415. ✖ ℝ

6406533047416. ✖ ℝ²

Question Id : 640653905131 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (102 to 104)

Question Label : Comprehension

Consider the function $f(x, y) = x^2 + xy + y^2 - 7x - 8y$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 102 Question Id : 640653905132 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

If f has a critical point at (a, b) ,
find $a + b$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 103 Question Id : 640653905133 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

Find the determinant of the
Hessian at (a, b) .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 104 Question Id : 640653905134 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

What is the nature of the critical point?

Options :

6406533047419. ✘ Local maximum

6406533047420. ✓ Local minimum

6406533047421. ✘ Saddle point

Question Id : 640653905135 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (105 to 107)

Question Label : Comprehension

Find three positive numbers x, y, z whose sum is 10 such that x^2yz^2 is maximum.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 105 Question Id : 640653905136 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

Enter the value of x .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 106 Question Id : 640653905137 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

Enter the value of y .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 107 **Question Id :** 640653905138 **Question Type :** SA **Calculator :** None

Correct Marks : 1

Question Label : Short Answer Question

Enter the value of z .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

DBMS

Section Id :	64065364164
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	21
Number of Questions to be attempted :	21
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134316
Question Shuffling Allowed :	No

Question Number : 108 **Question Id :** 640653905143 **Question Type :** MCQ **Calculator :** Yes

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 :

6406533047437. ✓ YES

6406533047438. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653134317

Question Shuffling Allowed : Yes

Question Number : 109 Question Id : 640653905144 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Let $S(Y, U, V)$ be a relation. Let $R(P, W, X, Y, Z)$ be another relation with the following functional dependencies:

$$\mathcal{F} = \{X \rightarrow ZW, Y \rightarrow X, W \rightarrow P\}$$

R contains 250 tuples and S contains 300 tuples. What is the maximum number of tuples possible as output of $R \times S$?

Options :

6406533047439. ✗ 75000

6406533047440. ✗ 250

6406533047441. ✓ 300

6406533047442. ✗ 50

Question Number : 110 Question Id : 640653905145 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the correct output obtained on running the given SQL statements on Table Employee.

EID	EName
E01	Arthur
E02	Raina
E03	Meena
E04	Arthur
E06	Joey

Table Employee

```
SQL> SAVEPOINT SP1;
SQL> UPDATE Employee SET EName='Jainie'
      WHERE EID='E06';
SQL> SAVEPOINT SP2;
SQL> DELETE FROM Employee WHERE EID='E02';
SQL> SAVEPOINT SP3;
SQL> UPDATE Employee SET EName='Raina'
      WHERE EID='E04';
SQL> ROLLBACK TO SP2;
```

Options :

EID	EName
E01	Arthur
E02	Raina
E03	Meena
E04	Arthur
E06	Jainie

6406533047443. ✓

EID	EName
E01	Arthur
E03	Meena
E04	Arthur
E06	Jainie

6406533047444. ✗

EID	EName
E01	Arthur
E03	Meena
E04	Raina
E06	Jainie

6406533047445. ✗

EID	EName
E01	Arthur
E02	Raina
E03	Meena
E04	Arthur
E06	Joey

6406533047446. ✗

Question Number : 111 Question Id : 640653905146 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Given below are four statements. Match each of them with the corresponding property in the set of ACID properties.

Statement 1: Any data written to the database must be valid according to all the defined rules like the check and key constraints and triggers.

Statement 2: Every completed transaction is saved into the secondary storage.

Statement 3: During money transfer, either the amount debited from the source account must be credited to the destination account or the money should not be debited from the source account at all.

Statement 4: If multiple transactions are being executed concurrently, then the final result should be the same irrespective of the sequence in which the transactions were executed.

Let A denote Atomicity, C denote Consistency, I denote Isolation and D denote Durability. From among the given options, find the correct match.

Options :

6406533047447. ✘ 1 - A, 2 - C, 3 - I, 4 - D

6406533047448. ✓ 1 - C, 2 - D, 3 - A, 4 - I

6406533047449. ✘ 1 - C, 2 - D, 3 - I, 4 - A

6406533047450. ✘ 1 - I, 2 - A, 3 - D, 4 - C

Question Number : 112 Question Id : 640653905147 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following monthly backup schedule used by a company:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1/ Full	2/ Incremental	3/ Incremental	4/ Incremental	5/ Incremental	6/ Incremental	7/ Differential
8/ Incremental	9/ Incremental	10/ Incremental	11/ Incremental	12/ Differential	13/ Incremental	14/ Incremental
15/ Incremental	16/ Incremental	17/ Differential	18/ Incremental	19/ Incremental	20/ Incremental	21/ Incremental
22/ Differential	23/ Incremental	24/ Incremental	25/ Incremental	26/ Incremental	27/ Incremental	28/ Incremental
29/ Incremental	30/ Incremental					

If a failure occurs on the 27th day of the month before the backup for the day has been completed, how many backup sets have to be loaded for a full recovery?

Options :

6406533047451. ✘ 4

6406533047452. ✘ 5

6406533047453. ✓ 6

6406533047454. ✘ 7

Question Number : 113 Question Id : 640653905150 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the table Players as given below:

PID	name	gender	level
001	Percy	Male	International
002	Jason	Male	District
003	Hazel	Female	National
004	Leo	Male	National
005	Rayna	Female	District
006	Annabeth	Female	National
007	Frank	Male	International
008	Piper	Female	District

Table 1: Players

Let us create two different bitmap indices, one on the *gender* attribute and the other on the *level* attribute. Which of the following options will give the correct result if we want to find all females who are playing in the 'District' level.

Note: Options are in the form of gender (operation) level

Options :

6406533047463. ✓ 00101101 AND 01001001

6406533047464. ✗ 00101101 OR 00110100

6406533047465. ✗ 11010010 AND 01001001

6406533047466. ✗ 11010010 OR 00110100

Sub-Section Number :

3

Sub-Section Id :

640653134318

Question Shuffling Allowed :

Yes

Question Number : 114 Question Id : 640653905148 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider a schedule S given below where $W_i(a)$ means that transaction T_i is performing a write operation on data item (a) and similarly $R_i(a)$ means that transaction T_i is performing a read operation on data item (a) .

S : $R_1(B), R_4(A), W_2(A), W_3(C), R_1(B), W_2(A), W_3(A), W_4(D), R_2(D), R_1(D)$

Identify the appropriate time stamp ordering for transactions T_1, T_2, T_3 and T_4 that allows to execute the given schedule S using the time stamp protocol.

Options :

6406533047455. ✗ 20, 30, 25, 15

6406533047456. ✗ 15, 20, 25, 30

6406533047457. ✓ 20, 25, 30, 15

6406533047458. ✗ 20, 25, 15, 30

Question Number : 115 Question Id : 640653905149 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

The following key values are inserted into a B^+ tree of order 4 in a given sequence. The tree is initially empty.

25,8,13,59,3,31,60,11,43

How many node splits will be required to perform these insertions?

Options :

6406533047459. ✘ 5

6406533047460. ✘ 4

6406533047461. ✘ 6

6406533047462. ✓ 3

Question Number : 116 Question Id : 640653905151 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Imagine you're designing a database for an employee management system where employees are categorized based on their departments, job roles, and joining dates. The schema includes a relation $\text{Employees}(EmpID, EmpName, Dept, JobRole, JoiningDate)$ to store information about the employees.

Choose the correct sets of functional dependencies for the relation

$\text{Employees}(EmpID, EmpName, Dept, JobRole, JoiningDate)$ under which Employees is in 3NF:

Options :

6406533047467. ✓ $\{EmpID \rightarrow (EmpName, Dept, JobRole, JoiningDate)\}$

6406533047468. ✘ $\{EmpID \rightarrow (EmpName, Dept, JobRole, JoiningDate), EmpName \rightarrow JoiningDate\}$

6406533047469. ✘ $\{EmpID \rightarrow (EmpName, Dept), Dept \rightarrow (JobRole, joiningDate)\}$

6406533047470. ✘ $\{EmpID \rightarrow EmpName, EmpName \rightarrow (Dept, JobRole, JoiningDate)\}$

Sub-Section Number :

4

Sub-Section Id :

640653134319

Question Shuffling Allowed :

Yes

Question Number : 117 Question Id : 640653905153 Question Type : MSQ Calculator : Yes

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct statement(s):

Options :

- 6406533047475. ✓ In a dense index, index record appears for every search-key value in the file.
- 6406533047476. ✓ Secondary index is also called non-clustering index
- 6406533047477. ✓ Sparse index contains index records for only some search-key values.
- 6406533047478. ✓ In an ordered index, index entries are stored sorted on the search key value.

Sub-Section Number :

5

Sub-Section Id :

640653134320

Question Shuffling Allowed :

Yes

Question Number : 118 Question Id : 640653905152 Question Type : MSQ Calculator : Yes**Correct Marks : 3 Max. Selectable Options : 0**

Question Label : Multiple Select Question

Let $A(T, U, V, W)$ be a relational schema with the following functional dependencies:

$$\mathcal{F} = \{W \rightarrow UT, UV \rightarrow W, V \rightarrow T, W \rightarrow U\}$$

We want to decompose the relation A into 3NF. We asked ChatGPT to decompose the relation into 3NF and below shown is the response from ChatGPT:

The decomposed schema in 3NF is:

1. R1(W, U, T)
2. R2(V, T)
3. R3(U, V, W)

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

Options :

6406533047471. ✓ The decomposition **R1, R2, R3** are in 3NF and all the dependencies are getting preserved.

6406533047472. ✗ In the decomposition, **R2** is not required. As **R1 and R3** is sufficient decomposition in 3NF and all the dependencies are getting preserved.

6406533047473. ✗ In the decomposition, **R1** is not required. As **R2 and R3** is sufficient decomposition in 3NF and all the dependencies are getting preserved.

6406533047474. ✓ In the decomposition, **R2** is not required. As **R1 and R3** is sufficient decomposition in 3NF but all the dependencies will not get preserved.

Question Number : 119 Question Id : 640653905154 Question Type : MSQ Calculator : Yes**Correct Marks : 3 Max. Selectable Options : 0**

Question Label : Multiple Select Question

Consider the following schedule S.

$$S : R_1(A), R_2(B), W_1(C), Com_1, R_3(B), R_3(C), W_2(B), W_3(A), Com_2, Com_3$$

Which of the following options is/are correct?

Options :

6406533047479. ✗ Schedule **S** can not be two-phase lockable.

6406533047480. ✓ Schedule **S** can be two-phase lockable.

640653047481. ✓ Schedule **S** can be strict two-phase lockable.

640653047482. ✓ Schedule **S** is conflict serializable.

Question Number : 120 Question Id : 640653905155 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following schedule **S**.

T1	T2
r(A)	r(b)
w(A)	r(A)
	w(A)
	w(B)
r(B)	
w(B)	

Table 2: schedule: **S**

Which of the following is true for schedule **S**?

Options :

640653047483. ✗ Schedule **S** is Conflict serializable

640653047484. ✗ Schedule **S** is View serializable

640653047485. ✓ Schedule **S** is not Conflict Serializable

640653047486. ✓ Schedule **S** is not View Serializable

Question Number : 121 Question Id : 640653905156 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Given relation `student_info(roll_no, name, subject, marks)` with `(roll_no, subject)` as candidate key. Which of the following functional dependencies violates the Third normal form(3NF)?

Options :

640653047487. ✗ $roll_no, subject \rightarrow marks$

640653047488. ✗ $roll_no, subject \rightarrow name$

640653047489. ✓ $name \rightarrow marks$

640653047490. ✓ $marks \rightarrow name$

Question Number : 122 Question Id : 640653905157 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following schema

Customers(C_id, C_name, address)

Items(Itm_id, Itm_name)

Orders(ord_id, C_id, Itm_id, cost)

Which of the following relational algebra expressions returns the name of customers who purchased biscuits?

Options :

6406533047491. ❌ $\Pi_{C_name}(\sigma_{Itm_name='biscuits'} Items \bowtie Orders)$

6406533047492. ✓ $\Pi_{C_name}(\Pi_{C_id}(\Pi_{Itm_id}(\sigma_{Itm_name='biscuits'} Items) \bowtie Orders) \bowtie Customers)$

6406533047493. ❌ $\Pi_{C_name}(\sigma_{Itm_name='biscuits'} Items \bowtie Customers)$

6406533047494. ✓ $\Pi_{C_name}((\sigma_{Itm_name='biscuits'} Items) \bowtie Orders \bowtie Customers)$

Question Number : 123 Question Id : 640653905159 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following schema

Students(StudentID, Name, Department)

Hostels(HostelID, H_name)

Hostel_Allocation(StudentID, HostelID, RoomNumber)

Which of the following queries returns the *StudentID* and *Name* of students to whom Narmada hostel is allotted?

Options :

6406533047499. ✓
SELECT Students.StudentID, Students.Name FROM Students
JOIN Hostel_Allocation ON Students.StudentID = Hostel_Allocation.StudentID
JOIN Hostels ON Hostel_Allocation.HostelID = Hostels.HostelID
WHERE Hostels.H_name = 'Narmada';

6406533047500. ❌
SELECT StudentID, Name FROM Students WHERE StudentID IN
(SELECT HostelID from Hostels WHERE Hostels.H_Name = 'Narmada');

```
SELECT Students.StudentID, Students.Name FROM Students  
JOIN Hostel_Allocation ON Students.StudentID = Hostel_Allocation.StudentID  
6406533047501. ✘ WHERE Hostels.H_Name = 'Narmada';
```

```
SELECT StudentID, Name FROM Students WHERE StudentID IN  
(SELECT StudentID from Hostel_Allocation WHERE HostelID =  
6406533047502. ✓ (SELECT HostelID from Hostels WHERE Hostels.H_Name = 'Narmada'));
```

Sub-Section Number :

6

Sub-Section Id :

640653134321

Question Shuffling Allowed :

Yes

Question Number : 124 Question Id : 640653905161 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

The following numbers are inserted into an empty binary search tree in the given order: 27, 23, 33, 49, 51, 92, 83, 10, 78. What is the height of the resulting binary search tree?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Question Number : 125 Question Id : 640653905162 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Consider a **Block nested loop join** for the two relations,**instructor** and **department**. Assuming the worst-case memory availability and **instructor** as the outer relation, the provided details are as follows:

- Total number of block transfers: 20500
- Total number of seeks required: 1000
- Number of block in the outer relation: 500

What is the number of blocks in the inner relations?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

40

Sub-Section Number :	7
Sub-Section Id :	640653134322
Question Shuffling Allowed :	Yes

Question Number : 126 **Question Id :** 640653905163 **Question Type :** SA **Calculator :** None

Correct Marks : 2

Question Label : Short Answer Question

Consider the given log records at an instance of time:

Table 3: Log records

< T_0 start >
< T_0 , A, 100, 200 >
< T_1 start >
< T_1 , B, 400, 300 >
< T_0 , C, 500, 600 >
< T_2 start >
< T_2 , D, 800, 700 >
< Commit T_1 >
< Checkpoint L >
< T_2 , C, 500, 1000 >
< Commit T_2 >
< T_0 , B, 400, 500 >

Suppose there is a system crash after the last log record. What will be the value of the expression $(B+C)-(A+D)$, based on the values stored on the disk at that point:

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

500

Sub-Section Number :	8
Sub-Section Id :	640653134323
Question Shuffling Allowed :	Yes

Question Number : 127 **Question Id :** 640653905158 **Question Type :** MSQ **Calculator :** Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the relational schema $R(A, B, C, D, E, F, G)$ with the given list of functional dependencies: $\mathcal{F} = \{B \rightarrow AC, E \rightarrow G, CD \rightarrow F\}$
Which of the following is/are a super key for R ?

Options :

6406533047495. ✓ $\{BDE\}$

6406533047496. ✗ $\{DE\}$

6406533047497. ✗ $\{CD\}$

6406533047498. ✗ $\{BGE\}$

Question Number : 128 Question Id : 640653905160 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the ER Diagram as shown below:

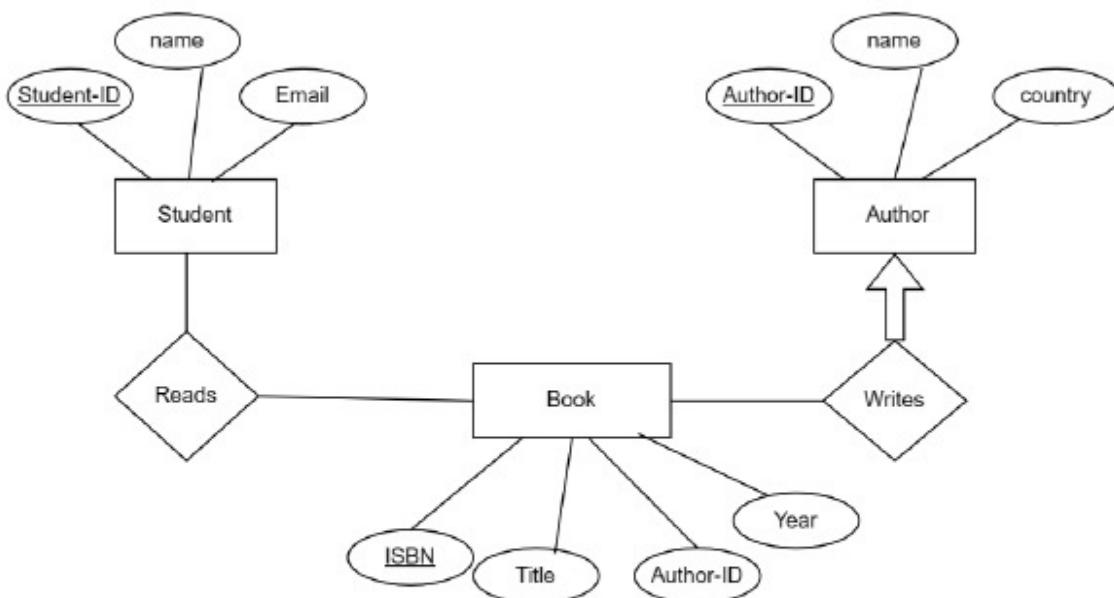


Figure 1: Library

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

Options :

6406533047503. ✗ There might exist an author who has not written any books

6406533047504. ✓ There might exist a student who has not read any book

6406533047505. ✗ An author can write at most one book

6406533047506. ✗ A student can read at most one book

PDSA

Section Id :	64065364165
Section Number :	7
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134324
Question Shuffling Allowed :	No

Question Number : 129 Question Id : 640653905164 Question Type : MCQ Calculator : Yes

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 :

6406533047510. ✓ YES

6406533047511. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653134325
Question Shuffling Allowed :	Yes

Question Number : 130 Question Id : 640653905165 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following function:

$$g1(n) = 5n + \log n$$

$$g2(n) = n \log n + n$$

$$g3(n) = n^3 + 100n \log n$$

$$g4(n) = 10 \log n$$

$$g5(n) = n \log (2^n)$$

Arrange the above functions in increasing order of asymptotic complexity.

Options :

6406533047512. ✘ $g4(n), g1(n), g2(n), g3(n), g5(n)$

6406533047513. ✓ $g4(n), g1(n), g2(n), g5(n), g3(n)$

6406533047514. ✘ $g1(n), g4(n), g2(n), g3(n), g5(n)$

6406533047515. ✘ $g4(n), g1(n), g3(n), g2(n), g5(n)$

Question Number : 131 Question Id : 640653905166 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

A list consisting of 2^k elements needs to be sorted on a system. Algorithms A and B require $100n \log_2 n$ and $2n^2$ time respectively. What is the maximum value of k for which algorithm B should be preferred over algorithm A?

Options :

6406533047516. ✓ 8

6406533047517. ✘ 9

6406533047518. ✘ 10

6406533047519. ✘ 11

Question Number : 132 Question Id : 640653905167 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

What is the recurrence and time complexity for the worst case behaviour of **Merge Sort** ?

Options :

6406533047520. ❌ Recurrence is $T(n) = 2T(n/2) + O(n)$ and time complexity is $O(n^2)$

6406533047521. ❌ Recurrence is $T(n) = T(n/2) + O(n)$ and time complexity is $O(n)$

6406533047522. ✓ Recurrence is $T(n) = 2T(n/2) + O(n)$ and time complexity is $O(n \log n)$

6406533047523. ❌ Recurrence is $T(n) = 2T(n/2) + O(1)$ and time complexity is $O(n \log n)$

Question Number : 133 Question Id : 640653905169 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider following is the updated list after applying the **Quick-sort partition** algorithm once.

```
L = [21, 33, 29, 34, 45, 48, 40, 60, 65]
```

The number of elements that could have been chosen as a pivot in the first round is ___ ?

Options :

6406533047525. ❌ 1

6406533047526. ❌ 2

6406533047527. ❌ 3

6406533047528. ✓ 4

Question Number : 134 Question Id : 640653905170 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

There is a stack `S` and a queue `Q`. Suppose the elements A, B, C, D, E, F, G and H are enqueued into `Q` in the reverse order i.e., starting from H . The following operations are performed on the stack and the queue.

```
1 S.push(Q.dequeue())
2 S.push(Q.dequeue())
3 S.push(Q.dequeue())
4 Q.enqueue(S.pop())
5 Q.enqueue(S.pop())
6 S.push(Q.dequeue())
7 S.push(Q.dequeue())
8 Q.enqueue(S.pop())
9 Q.enqueue(S.pop())
```

What is the state of queue `Q` after the above operation? Consider the first element of the list as front element of queue in options.

Options :

6406533047529. ✓ [C, B, A, F, G, D, E]

6406533047530. ✗ [C, B, A, G, F, D, E]

6406533047531. ✗ [C, B, A, F, G, E, D]

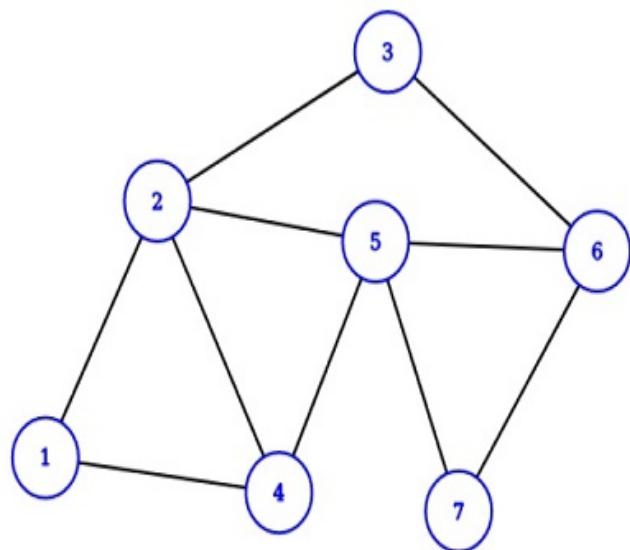
6406533047532. ✗ [C, B, A, G, F, E, D]

Question Number : 135 Question Id : 640653905171 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following graph



Which of the following vertex sequence is the correct **DFS traversal** on the graph started from node **6**? Assume that when a node has multiple neighbours, DFS would visit the numerically smaller valued node first.

Options :

6406533047533. ✓ 6,3,2,1,4,5,7

6406533047534. ✗ 6,3,2,1,5,4,7

6406533047535. ✗ 6,3,2,4,1,5,7

6406533047536. ✗ 6,3,5,7,2,4,1

Question Number : 136 Question Id : 640653905173 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

To determine the minimum number of sequential steps required for a chef to prepare a dish J, consider the following dependencies and constraints for the preparation process, where each step represents a time unit during which one or more items can be prepared in parallel:

1. Item A is used to make items C and D.
2. Item B is added to cook items E and F.
3. Item G is prepared by mixing items D and E.
4. Item B is made by boiling item A.
5. Item H is made by mixing items C and G.
6. Item I is made by adding water to item F.
7. The dish J is prepared by cooking items H and I together.

Given that the chef has enough assistants to work on multiple items in parallel, what is the minimum number of steps required to complete the dish J, considering all dependencies?

Options :

6406533047541. ✗ 4

6406533047542. ✘ 5

6406533047543. ✘ 3

6406533047544. ✓ 6

Question Number : 137 Question Id : 640653905174 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider a weighted, directed acyclic graph $G = (V, E, w)$ in which edges that leave the source vertex s may have negative weights and all other edge weights are non-negative.

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

- I. Dijkstra's algorithm computes an incorrect shortest-path weight $\delta(s, t)$ from s to at least one vertex t in this graph G .
- II. Bellman's Ford algorithm correctly computes the shortest-path weight $\delta(s, t)$ from s to every vertex t in this graph G .

Options :

6406533047545. ✘ Only I is correct

6406533047546. ✓ Only II is Correct

6406533047547. ✘ Both I and II are correct

6406533047548. ✘ Both I and II are incorrect

Question Number : 138 Question Id : 640653905175 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

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

- I. If the shortest path entry `SP[i][i]` in the resultant matrix is negative, then it represents the graph has a negative weight cycle.
- II. It works correctly if the graph has negative edge weights but does not have negative weight cycles.
- III. It is single source shortest path algorithm.

Options :

6406533047549. ✓ Only statement I and II are correct

6406533047550. ✘ Only statement I and III are correct

6406533047551. ✘ Only statement II and III are correct

6406533047552. ✘ All statements are correct

6406533047553. ✘ All statements are incorrect

Question Number : 139 Question Id : 640653905178 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Pre-order traversal of a given binary search tree T produces the following sequence of keys:

15, 12, 5, 2, 8, 6, 11, 14, 25, 20, 35

Right child of element 8 is__.

Options :

6406533047556. ✘ 12

6406533047557. ✓ 11

6406533047558. ✘ 14

6406533047559. ✘ 8 is a leaf node.

Question Number : 140 Question Id : 640653905183 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following recursive function to find the maximum element in list L of size n where

lower and upper represents the first index and last index of list L respectively.

```
1 def find_max(L, lower, upper):
2     if upper-lower == 0:
3         return L[lower]
4     mid = (upper+lower) // 2
5     left_max = find_max(L,lower,mid)
6     right_max = find_max(L,mid+1,upper)
7     return max(left_max, right_max)
```

What is the Recurrence relation of the given function?

Options :

6406533047570. ✓ $T(n) = 2T(n/2) + 1$, $T(1) = 1$

6406533047571. ✘ $T(n) = 2T(n/2) + n$, $T(1) = 1$

6406533047572. ✘ $T(n) = T(n/2) + n$, $T(1) = 1$

6406533047573. ✘ $T(n) = T(n/2) + 1$, $T(1) = 1$

Question Number : 141 Question Id : 640653905184 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Subsequence: A subsequence is a sequence that appears in the same relative order in the source strings, but not necessarily consecutively.

In the Longest Common Subsequence problem we are given two string $S_1 = a_1a_2\dots a_m$ and $S_2 = b_1b_2,\dots b_n$. To get the length of Longest Common Subsequence at $LCS[m][n]$, the recursion formula is given as follows to fill matrix $LCS[i][j]$ where $0 \leq i \leq m$ and $0 \leq j \leq n$.

$$LCS[i, j] = \begin{cases} 0, & \text{if } i = 0 \text{ or } j = 0 \\ 1 + LCS[i - 1, j - 1], & \text{if } a_i = b_j \\ \underline{\quad}, & \text{if } a_i \neq b_j \end{cases}$$

Which among the following is the correct statement to fill the blank.

Options :

6406533047574. ✘ $\min(LCS[i - 1, j], LCS[i, j - 1])$

6406533047575. ✓ $\max(LCS[i - 1, j], LCS[i, j - 1])$

6406533047576. ✘ $\min(LCS[i - 1, j] + 1, LCS[i, j - 1] + 1)$

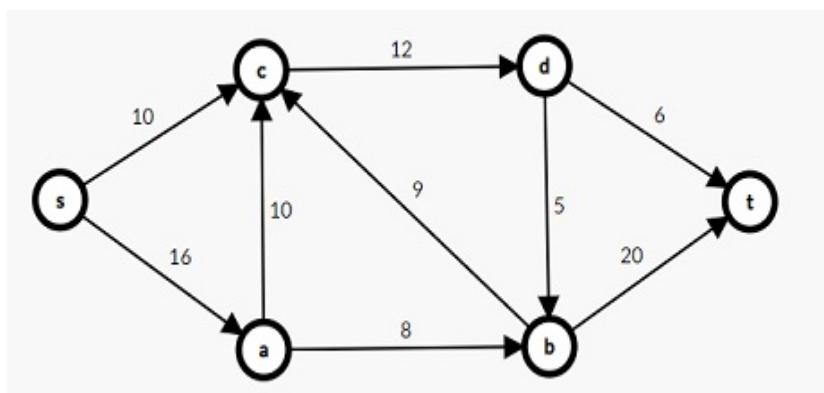
6406533047577. ✘ $LCS[i - 1, j - 1] + 1$

Question Number : 142 Question Id : 640653905189 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

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



The value of the maximum flow in the given network is__

Options :

6406533047591. ✘ 14

6406533047592. ✘ 25

6406533047593. ✓ 19

6406533047594. ✗ 20

Question Number : 143 Question Id : 640653905190 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Let Z be an NP-complete problem and X and Y be two other problems not known to be in NP. X is polynomial time reducible to Z and Z is polynomial-time reducible to Y. Which one of the following statements is true?

Options :

6406533047595. ✗ Y is NP-complete

6406533047596. ✓ Y is NP-hard

6406533047597. ✗ X is NP-complete

6406533047598. ✗ X is NP-hard

Sub-Section Number :

3

Sub-Section Id :

640653134326

Question Shuffling Allowed :

Yes

Question Number : 144 Question Id : 640653905168 Question Type : SA Calculator : None

Correct Marks : 4

Question Label : Short Answer Question

Given the following sorted list :

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

If we use the binary search algorithm to search for element 99 in the given list, then the number of list elements for comparison to 99 (including comparison with 99 in list) in this process is__.

Note: Assume here that binary search will compute the midpoint by using

$(First\ index + Last\ index)/2$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 145 Question Id : 640653905176 Question Type : SA Calculator : None

Correct Marks : 4

Question Label : Short Answer Question

Consider a complete undirected graph with vertex set $\{0, 1, 2, 3, 4\}$. Every entry $w[i][j]$ where $i \neq j$ in the matrix w below is the weight of the edge from vertex i to vertex j .

$$W = \begin{bmatrix} 0 & 2 & 10 & 3 & 5 \\ 2 & 0 & 8 & 4 & 6 \\ 10 & 8 & 0 & 9 & 7 \\ 3 & 4 & 9 & 0 & 1 \\ 5 & 6 & 7 & 1 & 0 \end{bmatrix}$$

What is the weight of the minimum spanning tree for the given graph?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

13

Question Number : 146 **Question Id :** 640653905177 **Question Type :** SA **Calculator :** None

Correct Marks : 4

Question Label : Short Answer Question

The number of leaf nodes in a rooted tree of 10 nodes, with each node having 0 or 3 children is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Question Number : 147 **Question Id :** 640653905180 **Question Type :** SA **Calculator :** None

Correct Marks : 4

Question Label : Short Answer Question

Consider the following tasks T_1, \dots, T_9 .

Task	T1	T2	T3	T4	T5	T6	T7	T8	T9
Deadline	7	2	5	3	4	5	2	7	3

The execution of each task requires one unit of time. We can execute one task at a time. What is the maximum number of tasks that can be completed without lateness(before or by the deadline)? Consider the start time 0.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Question Number : 148 **Question Id :** 640653905182 **Question Type :** SA **Calculator :** None

Correct Marks : 4

Question Label : Short Answer Question

Consider the following code to find median.

```
1 def MoM(L):
2     if len(L) <= 5:
3         L.sort()
4         return L[2]
5     M = []
6     for i in range(0,len(L),5):
7         X = L[i:i+5]
8         X.sort()
9         M.append(X[2])
10    return MoM(M)
```

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

`L = [73, 3, 55, 8, 49, 69, 35, 84, 39, 60, 18, 67, 94, 52, 5, 16, 41, 58, 36, 91, 19, 59, 7, 78, 81]`

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

52

Sub-Section Number : 4

Sub-Section Id : 640653134327

Question Shuffling Allowed : Yes

Question Number : 149 **Question Id :** 640653905172 **Question Type :** MSQ **Calculator :** Yes

Correct Marks : 4 **Max. Selectable Options :** 0

Question Label : Multiple Select Question

Let T_B and T_D be the BFS tree and DFS tree respectively generated when BFS and DFS are applied on the node s in undirected and unweighted graph G . Let $d(x)$ be the shortest distance of node x from the node s in G . Which among the following statements is/are correct ?

Options :

6406533047537. ✓ For every neighbor v of s in graph G , the edge (s, v) must exist in T_B .

6406533047538. ✗ If (u, v) is an edge of G that is not in T_B then $|d(u) - d(v)| > 1$.

6406533047539. ✗ If there is path from s to u in T_D , then u is in a different component from s .

6406533047540. ✓ The number of edges in T_B and T_D is equal.

Question Number : 150 Question Id : 640653905179 Question Type : MSQ Calculator : Yes

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider a binary **max-heap** implemented using list. Which of the following lists represents a binary max-heap?

Options :

6406533047560. ✗ [25, 12, 16, 13, 10, 8, 14]

6406533047561. ✗ [25, 14, 13, 16, 10, 8, 12]

6406533047562. ✓ [25, 14, 16, 13, 10, 8, 12]

6406533047563. ✓ [25, 14, 16, 13, 12, 8, 10]

Question Number : 151 Question Id : 640653905181 Question Type : MSQ Calculator : Yes

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statement(s) is/are **true** about Huffman algorithm ?

Options :

In a Huffman tree, if a leaf labelled x is at depth(from root) smaller than the leaf labelled y ,

6406533047565. ✓ then $frequency(x) \geq frequency(y)$.

6406533047566. ✓ Huffman coding algorithm uses greedy approach to construct the Huffman tree.

In a Huffman tree, if a leaf labelled x is at depth(from root) smaller than the leaf labelled y ,

6406533047567. ✗ then $frequency(x) \leq frequency(y)$.

6406533047568. ✗ In Huffman codes, The code of one character can be prefix of other character's code.

Question Number : 152 Question Id : 640653905188 Question Type : MSQ Calculator : Yes

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

A company makes two kinds of leather belts, belt A and belt B . Belt A is a high quality belt and belt B is of lower quality. The respective profits are Rs 4 and Rs 3 per belt. The production of each type A requires twice as much time as a belt of type B ; if all belts were of type B , the company could make only 1000 belts per day. The supply of leather is sufficient for only 800 belts per day (both A and B combined). Belt A requires a fancy buckle and only 400 of these are available per day. There are only 700 buckles a day available for belt B .

The above problem is to be formulated as a linear programming problem. Let x_1 and x_2 be the number of belts of type A and B respectively manufactured each day.

Which of the following is/are valid constraints ?

Options :

6406533047586. ✓ $x_1 \leq 400$

6406533047587. ✓ $x_2 \leq 700$

6406533047588. ✗ $x_1 + 2x_2 \leq 800$

6406533047589. ✓ $2x_1 + x_2 \leq 1000$

6406533047590. ✗ $x_1, x_2 \leq 0$

Sub-Section Number :

5

Sub-Section Id :

640653134328

Question Shuffling Allowed :

No

Question Id : 640653905185 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (153 to 154)

Question Label : Comprehension

Your final end term exams are going to be over and you are catching up on Netflix. You have a schedule of interesting live shows during the next day. You hate to start or stop watching a show midway, so your aim is to watch as many complete shows as possible during the day.

Suppose there are n such shows S_1, S_2, \dots, S_n available during the same day.

The shows are ordered by starting time, so for each $i \in \{1, 2, \dots, n - 1\}$, S_i starts before S_{i+1} . However, show S_i may not end before S_{i+1} starts, so for each $i \in \{1, 2, \dots, n - 1\}$, $\text{next}[i]$ is the smallest $j > i$ such that S_j starts after S_i finishes if such a j exists, otherwise -1 . Given the sequence S_1, S_2, \dots, S_n and the values $\text{next}[i]$ for each $i \in \{1, 2, \dots, n - 1\}$, aim is to compute the maximum number of complete shows that can be watched.

Based on the above data, answer the given subquestions.

Sub questions

**Question Number : 153 Question Id : 640653905186 Question Type : MCQ Calculator : Yes
Correct Marks : 4**

Question Label : Multiple Choice Question

Consider the following dynamic programming approach. Let $\text{watch}[i]$ denote the maximum number of complete shows that can be watched among S_i, \dots, S_n .

Consider the following

optimal substructure of $\text{watch}[i]$

for $i \in n, n - 1, n - 2, \dots, 2, 1$?

$$\text{watch}[i] = \begin{cases} 1, & \text{if } i = n \\ \text{watch}[i + 1], & \text{if } \text{next}[i] = -1 \\ \underline{\quad}, & \text{if } \text{next}[i] \neq -1 \end{cases}$$

Which among the following statements

fills the blank correctly ?

Options :

6406533047578. ✓ $\max\{1 + \text{watch}[\text{next}[i]], \text{watch}[i + 1]\}$

6406533047579. ✘ $\max\{watch[next[i]], watch[i + 1]\}$

6406533047580. ✘ $\max\{watch[next[i]], 1 + watch[i + 1]\}$

6406533047581. ✘ $\max\{1 + watch[next[i]], 1 + watch[i + 1]\}$

Question Number : 154 Question Id : 640653905187 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

What is the time complexity of the given algorithm ?

Options :

6406533047582. ✘ $O(n^2)$

6406533047583. ✘ $O(n \log n)$

6406533047584. ✓ $O(n)$

6406533047585. ✘ $O(n^3)$

AppDev1

Section Id :	64065364166
Section Number :	8
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	32
Number of Questions to be attempted :	32
Section Marks :	100
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134329
Question Shuffling Allowed :	No

Question Number : 155 Question Id : 640653905191 Question Type : MCQ Calculator : Yes

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 :

6406533047599. ✓ YES

6406533047600. ✘ NO

Sub-Section Number : 2

Sub-Section Id : 640653134330

Question Shuffling Allowed : Yes

Question Number : 156 Question Id : 640653905192 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following Python code snippet.

```

file.py
from jinja2 import Template
import sys
input_list = sys.argv
var_a, var_b = input_list[1], input_list[2]

if input_list[1]=="Meera":
    var_b = "Data Analyst"
elif input_list[1]=="Radha":
    var_b = "Scientist"
else:
    pass
template = "{{var_a}} is {{var_b}}"
t = Template(template)
print(t.render(var_a = var_a, var_b = var_b))

```

Map the commands in column A with the output on the terminal in column B.

Column A	Column B
a) python file.py Radha Data Analyst	1) Meera is Scientist
b) python file.py Meera Scientist	2) Sneha is Web
c) python file.py Sneha Web Developer	3) Meera is Data Analyst
	4) Radha is Data Analyst
	5) Radha is Scientist
	6) Sneha is Web developer

Options :

640653047601. ✘ a - 4, b - 1, c - 6

640653047602. ✘ a - 5, b - 3, c - 6

640653047603. ✘ a - 5, b - 1, c - 2

640653047604. ✓ a - 5, b - 3, c - 2

Question Number : 157 Question Id : 640653905193 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following HTML document.

```

<!DOCTYPE html>
<html>
<head>
    <style>
        span {
            background-color: yellow;
            color: red;
        }
        #id {
            border: 2px solid purple;
            color: blue;
            display: inline-block;
        }
        .class {
            background-color: aqua;
            color: red;
            display: block;
            width: 20%;
        }
    </style>
</head>
<body>
    <span class="class" id="id">SPAN</span>
    <span class="class">SPAN</span>
    <span>SPAN</span>
</body>
</html>

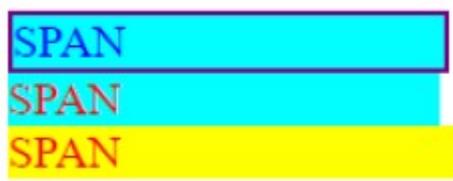
```

How will the browser render above HTML file?

Options :

6406533047605. ✖  SPAN SPAN SPAN

6406533047606. ✖  SPAN SPAN SPAN

6406533047607. ✖  SPAN
SPAN
SPAN

6406533047608. ✓

SPAN

SPAN

SPAN

Question Number : 158 Question Id : 640653905194 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following flask application.

app.py

```
from flask import Flask, request
app = Flask(__name__)
@app.route('/calculate')
def calculate():
    a = request.args.get('a')
    b = request.args.get('b')
    operator = request.args.get('operator')
    if a and b and operator:
        if operator == 'one':
            return f'{a} + {b} = {a+b}'
        elif operator == 'two':
            return f'{a} - {b} = {int(a) - int(b)}'
        elif operator == 'three':
            return f'{a} x {b} = {int(a)*b}'
    else:
        return 'Error: Insufficient arguments'
app.run(debug=True)
```

If the application is running locally on <http://127.0.0.1:5000> then match the URLs with their rendered output?

	URLs		Output
1	http://localhost:5000/calculate?a=4&b=2&operator=two	a	$4 \times 2 = 8$
2	http://localhost:5000/calculate?a=4&b=2&operator=three	b	$4 + 2 = 6$
3	http://localhost:5000/calculate?a=4&b=2&operator=one	c	$4 - 2 = 2$
		d	$4 + 2 = 42$
		e	$4 \times 2 = 2222$

Options :

640653047609. ✖ 1-c, 2-a, 3-b

640653047610. ✖ 1-c, 2-a, 3-d

640653047611. ✓ 1-c, 2-e, 3-d

640653047612. ✗ 1-c, 2-a, 3-e

Question Number : 159 Question Id : 640653905203 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following flask view functions will return a 200 OK for the URL:

<http://127.0.0.1:5000/details/1001/Michael> ?

Options :

```
@app.route('/details/<int:id>/<string:name>')
def show(id, name):
    details = {'student_id': id, 'student_name': name}
    return details
```

640653047641. ✗

```
@app.route('/details/<string:id>/<string:name>')
def show(id, name):
    details = {'student_id': id, 'student_name': name}
    return details
```

640653047642. ✗

```
@app.route('/details/<id>/<name>')
def show(id, name):
    details = {'student_id': id, 'student_name': name}
    return details
```

640653047643. ✗

640653047644. ✓ All of these

Question Number : 160 Question Id : 640653905204 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider a function func, and a set of test cases given below.

Filename: test_file.py

```
import pytest
def func(x,y):
    out = x**2+y**2
    return out

class Test_class0():
    def test_case1(self):
        assert func(1,2) == 5

    def case_test2(self):
        assert func(2,3) == 13

    def case_test3(self):
        assert func(6,2) == 38

class Test_class1():
    def test_case1(self):
        assert func(5,2) == 29

    def case_test2(self):
        assert func(1,1) == 2
```

What will be the output on the terminal for the command below?

pytest test_file.py -k Test_class

Options :

6406533047645. ✘ == 1 failed, 4 passed in 0.17s ===

6406533047646. ✘ == 2 passed, 3 deselected in 0.17s ===

6406533047647. ✓ == 2 passed in 0.07s ===

6406533047648. ✘ == 3 failed, 2 passed in 0.17s ===

Question Number : 161 Question Id : 640653905207 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

The lens of an HDD can read data on the rotating disk with the speed of 42,000 bits per second.

The disk is designed such that 600 bits pass under the lens for every revolution of the disk, what should be the maximum speed of disk in RPM so that the lens does not miss any data?

Options :

- 6406533047657. ✘ 70 RPM
- 6406533047658. ✘ 100 RPM
- 6406533047659. ✓ 4200 RPM
- 6406533047660. ✘ 6000 RPM

Question Number : 162 Question Id : 640653905210 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below two python files code snippets *app.py* and *test_app_route.py*.

app.py

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

@app.route("/greet/<string:name>")
def home(name):
    return "Hello, " + name

if __name__ == "__main__":
    app.run()
```

test_app_route.py:

```
import pytest, requests

@pytest.fixture
def get_response():
    resp = requests.get("http://127.0.0.1:5000/greet/IITM")
    return resp

def test_response(get_response):
    assert get_response.text == "Hello, IITM"
```

Assume that *app.py* and *test_app_route.py* are running on two different terminals. And also all required modules are installed. Which of the below statement(s) are True?

i) Executing the command `pytest test_app_route.py` on the terminal returns

`===== 1 passed =====`

ii) Executing the command `pytest test_app_route.py` on the terminal returns

`===== 1 failed =====`

iii) Executing the command `pytest test_app_route.py` on the terminal returns

`===== 1 selected, 1 passed =====`

iv) Executing the command `pytest test_app_route.py` on the terminal returns

`===== 1 deselected =====`

Options :

6406533047669. ✓ Only statement i is correct

6406533047670. ✗ Only statement ii is correct

6406533047671. ✗ Statements i and iii are correct

6406533047672. ✗ Statements ii and iv are correct

Question Number : 163 Question Id : 640653905212 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following flask resource created using flask_restful.

```
from flask import Flask, request
from flask_restful import Api, Resource, reqparse

app = Flask(__name__)
api = Api(app)

parser = reqparse.RequestParser()
parser.add_argument("val")

class RestApi(Resource):
    def post(self, val):
        arg1 = parser.parse_args()
        arg2 = request.args
        return {
            "Course_1": arg1["val"],
            "Course_2": arg2["val"],
            "Course_3": val
        }

api.add_resource(RestApi, "/api/courses/<val>")
app.run(debug = True)
```

If the application is running locally on `http://127.0.0.1:5000`, What will be the output on the terminal for the command:

```
curl http://127.0.0.1:5000/api/courses/DBMS?val=JAVA -d
"{"val":"PDSA"}" -X POST -H "Content-Type: application/json"
```

Options :

```
{
    "Course_1": "JAVA",
    "Course_2": "PDSA",
    "Course_3": "DBMS"
}
```

6406533047677. ✘

6406533047678. ✘

```
{  
    "Course_1": "DBMS",  
    "Course_2": "JAVA",  
    "Course_3": "PDSA"  
}
```

```
{  
    "Course_1": "PDSA",  
    "Course_2": "JAVA",  
    "Course_3": "DBMS"  
}
```

6406533047679. ✓

```
{  
    "Course_1": "PDSA",  
    "Course_2": "DBMS",  
    "Course_3": "JAVA"  
}
```

6406533047680. ✘

Question Number : 164 Question Id : 640653905216 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

A flask application shown below is running locally on <http://127.0.0.1:5000>.

```
from flask import Flask, request, session, abort

app = Flask(__name__)
app.config['SECRET_KEY'] = "yekterces"

@app.route('/login')
def log_in():
    user = request.args['user']
    role = request.args['role'] if 'role' in request.args else
    'general'
    session['user'], session['role'] = user, role
    return "Logged in successfully!"

@app.route('/home')
def land():
    if 'user' in session:
        if session['role'] == 'admin':
            return f"Welcome {session['user']}"
        return abort(401)
    return abort(404)

@app.route('/logout')
def log_out():
    session.pop('user', None)
    session.pop('role', None)
    return "Logged out sucessfully!"

app.run(debug=True)
```

If the application is running locally on <http://127.0.0.1:5000>, What will be the correct sequence of response status codes if the client visits the URLs one by one in the sequence given below?

1. <http://127.0.0.1:5000/home>
2. <http://127.0.0.1:5000/login/admin>
3. <http://127.0.0.1:5000/login?user=admin>
4. <http://127.0.0.1:5000/home>
5. <http://127.0.0.1:5000/logout>

Options :

6406533047693. *

401
401
200
404
200

404
200
200
200

6406533047694. ✘ 200

404
404
200
401
200

6406533047695. ✓ 200

404
200
404
200
200

6406533047696. ✘ 200

Question Number : 165 Question Id : 640653905217 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following flask application.

Python file: app.py

```
from flask import Flask, render_template, request

app = Flask(__name__)

emp = {'admin':'manoj', 'user':'sumit'}

@app.route('/profile/<user>')
def profile(user):
    access = request.args.get('access')
    if emp[access] != user:
        return render_template("profile.html", user = user,
                               access = access, error = True)
    return render_template("profile.html", user = user,
                           access = access, error = False)

app.run()
```

Template file: profile.html

```
<body>
    <div>
        {% if error %}
            <h3>Hi {{user}}, {{access}} access denied</h3>
        {% else %}
            <h3>Hi {{user}}, you are logged in as {{access}}.</h3>
        {% endif %}
    </div>
</body>
```

If the application is running locally on <http://127.0.0.1:5000>, then what will be rendered by the browser for URL,

<http://127.0.0.1:5000/profile/sumit?access=admin> ?

Options :

6406533047697. ✘ **Hi sumit, you are logged in as admin.**

6406533047698. ✘ **Hi sumit, you are logged in as user.**

6406533047699. ✓ **Hi sumit, admin access denied.**

6406533047700. ✘

Hi sumit, user access denied.

Question Number : 166 Question Id : 640653905220 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following models Library and Book corresponding to tables library and book in SQLite database.

```
class Library(db.Model):
    id = db.Column(db.Integer(), primary_key = True)
    name = db.Column(db.String(), unique = True)

class Book(db.Model):
    id = db.Column(db.Integer(), primary_key = True)
    name = db.Column(db.String(), unique = True)
    library = db.Column(db.Integer(), db.ForeignKey("library.id"))
```

Based on the model schemas, what relationship do the classes Library and Book share?

Options :

640653047710. ✘ Many-to-Many

640653047711. ✓ One-to-Many

640653047712. ✘ One-to-One

640653047713. ✘ The tables are not at all related

Question Number : 167 Question Id : 640653905223 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Read the statements given below carefully and select the correct option.

Statement 1: If an element having an ID and a class is styled externally using both its ID and the class, then for the same attribute, it will acquire styling from the latest selector in order.

Statement 2: If an element that belongs to two different classes is styled externally using both the classes, then for the same attribute, it will acquire styling from the latest class in order.

Options :

640653047722. ✘ Both statements 1 and 2 are correct

640653047723. ✘ Both statements 1 and 2 are incorrect

640653047724. ✘ Statement 1 is correct but statement 2 is incorrect

640653047725. ✓ Statement 2 is correct but statement 1 is incorrect

Sub-Section Id :

640653134331

Question Shuffling Allowed :

Yes

Question Number : 168 Question Id : 640653905206 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following Python code snippet.

log.py

```
import logging
import sys

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

def check_val(value):
    if value < 0:
        raise ValueError("Invalid value: Please enter a positive value.")
    else:
        logging.info("Value added: %s", value)

try:
    input_value = -int(sys.argv[1])
    check_val(input_value)
except ValueError as ve:
    logging.exception("Exception occurred: %s", str(ve))
```

What will be the output on the terminal for the command: python log.py -12 ?

Options :

6406533047653. ✘

2023-08-14 21:01:05,684 - INFO - Value added: 12

6406533047654. ✘

2023-08-14 21:01:05,684 - WARNING - Value added: -12

6406533047655. ✘

Error: Exception occurred: Invalid value: Please enter a positive value.

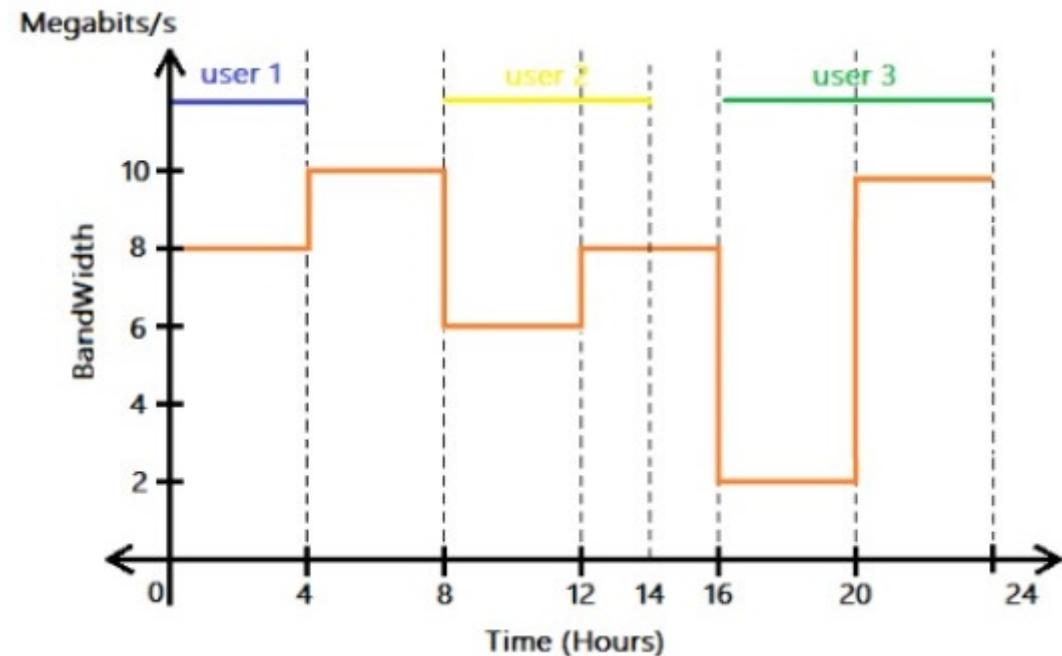
6406533047656. ✓ None of these

Question Number : 169 Question Id : 640653905209 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following graph that represents the variation in bandwidth of a network for an entire day (24 hours). Three users were connected to the network at three different times of the day. What is the total data consumed in GigaBytes by all the users in 24 hrs?



Options :

640653047665. ❌ 633.6 GB

640653047666. ✓ 54 GB

640653047667. ❌ 120 GB

640653047668. ❌ 432 GB

Question Number : 170 Question Id : 640653905213 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the below flask application.

```
from flask_sqlalchemy import SQLAlchemy
from flask import Flask

app = Flask(__name__)
app.config['SQLALCHEMY_DATABASE_URI'] = 'sqlite:///testdb.sqlite3'
db = SQLAlchemy(app)
app.app_context().push()

class Material(db.Model):
    m_id = db.Column('m_id', db.Integer, primary_key=True)
    name = db.Column('name', db.String(100), unique=True)

db.create_all()
material1 = Material(name='Steel')
db.session.add(material1)
material2 = Material(name='Iron')
material3 = Material(name='Aluminium')
db.session.add(material2)
db.session.commit()
db.session.add(material3)

all_material = Material.query.all()
print([(x.m_id, x.name) for x in all_material])
```

If you run the flask application using a terminal. What will be the output in the terminal?

Options :

[(1, 'Steel'), (2, 'Iron')] will be displayed in the terminal and two records will be **6406533047681.** ❌ added in the “testdb” database.

[(1, 'Steel'), (2, 'Iron'), (3, 'Aluminium')] will be displayed in the terminal and **6406533047682.** ❌ three records will be added in the “testdb” database.

[(1, 'Steel'), (2, 'Iron'), (3, 'Aluminium')] will be displayed in the terminal and **6406533047683.** ✓ and two records will be added in the “testdb” database.

[(1, 'Steel', 2, 'Iron', 3, 'Aluminium')] will be displayed in the terminal and **6406533047684.** ❌ two records will be added in the “testdb” database.

Question Number : 171 Question Id : 640653905219 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

A client machine C is 18000 kms away from the server machine S. A router R is situated somewhere in between the client C and the server S and is connected to client C with cable and makes aerial connection with the server S. What will be the round-trip latency (milliseconds) of the network if the router is placed at exactly midway from the client and the server? [Assume: The speed of light on cable is 1.5×10^8 m/s and in air is 3×10^8 m/s. The client, server and the router lie on a straight line]

Options :

6406533047706. ✘ 45

6406533047707. ✘ 90

6406533047708. ✓ 180

6406533047709. ✘ 270

Sub-Section Number :

4

Sub-Section Id :

640653134332

Question Shuffling Allowed :

Yes

Question Number : 172 Question Id : 640653905201 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following flask app and Jinja2 template.

app.py

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

@app.route('/')
def index():
    return render_template("index.html", data=['Harry', 'Karl', 'John',
'Jason', 'Ros'])

app.run()
```

index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>Macro</title>
</head>
<body>
    {% macro unordered_list(items)%}
        <ul>
            {% for item in items %}
                {% if item|length >= 5 %}>
                    <li>{{item}}</li>
                {% endif %}
            {% endfor %}
        </ul>
    {% endmacro %}
    {{ unordered_list(data) }}
</body>
</html>
```

If the flask app is running locally on <http://127.0.0.1:5000>. What will be the output on the browser for the base URL?

Options :

- Harry
- Karl
- John
- Jason
- Ros

6406533047633. ✘

6406533047634. ✘

- Karl
- John

- Harry

6406533047635. ✓ • Jason

- Karl
- John
- Ros

6406533047636. ✗

Question Number : 173 Question Id : 640653905202 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Match the following types of testing with their functionality.

A. Regression testing	1. Beta Testing
B. User Acceptance testing	2. one step beyond integration testing, includes server and environment
C. System Testing	3. Simulates actual user interaction, allows to script browser
D. System testing Automation	4. Type of testing that runs after every change to ensure that the change introduces no unintended breaks.

Which of the following is the correct matching?

Options :

6406533047637. ✗ A → 1, B → 2, C → 3, D → 4

6406533047638. ✗ A → 4, B → 3, C → 2, D → 1

6406533047639. ✓ A → 4, B → 1, C → 2, D → 3

6406533047640. ✗ A → 3, B → 2, C → 1, D → 4

Question Number : 174 Question Id : 640653905205 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following python code snippet app.py, the HTML files, base.html and home.html residing in "templates" folder.

app.py

```
from flask import Flask, render_template
app = Flask(__name__)
@app.route('/')
def home():
    return render_template('home.html')
app.run(debug=True)
```

home.html

```
{% extends "base.html" %}
{% block content %}
<p>MAD I</p>
<span>MAD II</span>
<p>DBMS</p>
{% endblock %}
```

base.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>IITM</title>
</head>
<body>
    <h2 style="color: violet;"> Diploma Courses </h2>
    {% block content %}
    {% endblock %}
</body>
</html>
```

What will be the rendered output for base URL if flask app is running locally on
<http://localhost:5000> ?

Options :

MAD I

MAD II

6406533047649. ✘ DBMS

6406533047650. ✓

Diploma Courses

MAD I

MAD II

DBMS

Diploma Courses

MAD I

6406533047651. ✘ MAD II DBMS

MAD I

6406533047652. ✘ MAD II DBMS

Question Number : 175 Question Id : 640653905211 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

You have a DRAM module with bus width of 64 bits, clock speed of 2 GHz, and operating in DDR (double-data-rate or two values per clock cycle) mode. What is the maximum bandwidth (in Giga-bytes per second) of data transfer achievable with this module?

Options :

6406533047673. ✘ 16

6406533047674. ✘ 8

6406533047675. ✓ 32

6406533047676. ✘ 128

Question Number : 176 Question Id : 640653905214 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

The hexadecimal equivalent of the IPv4 address 172.16.254.10 would be _____.

Options :

6406533047685. ✘ AC0A FE01

6406533047686. ✘ CA10 EF0A

6406533047687. ✘ AC01 0AEF

6406533047688. ✓ AC10 FE0A

Question Number : 177 Question Id : 640653905222 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following is true about the term “stateless” in the client-server model?

Options :

6406533047718. ❌ The server keeps the state of the client to respond to the required request.
6406533047719. ❌ Server use variant HTTP methods to respond to the client's request.
6406533047720. ✓ Server ready to respond to the client's request without knowing anything about the client.
6406533047721. ❌ Server use the URL to convey context to the client.

Sub-Section Number :

5

Sub-Section Id :

640653134333

Question Shuffling Allowed :

Yes

Question Number : 178 Question Id : 640653905195 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following Python code snippet “code.py”.

Filename: code.py

```
import sys
from jinja2 import Template
vars = sys.argv

course_technologies = {'python': 'backend', 'javascript': 'frontend'}
template = Template("This course focuses on {{ technology }} development.")

if len(vars) > 2 and vars[2] in course_technologies:
    course = vars[1]
    technology = course_technologies[course]
    print(template.render(technology=technology))
else:
    print("Please specify a valid course name!")
```

Which of the following will be the correct command line input to the terminal to get the output: This course focuses on backend development. ?

Options :

6406533047613. ❌ python code.py course python

6406533047614. ✓ python code.py python javascript

6406533047615. ✓ python code.py python python

6406533047616. ✖ python code.py python backend

Question Number : 179 Question Id : 640653905200 Question Type : MSQ Calculator : Yes

Correct Marks : 2 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 = {"CS2001": "DBMS", "CS2003": "MAD-I", "CS2006": "MAD-II"}
@app.route('/login')
def login():
    username = request.args.get('uname')
    if username not in data:
        abort(400, "Bad Request: Invalid Username")
    return f'

# Welcome to {data[username]} course!

'

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=CS2001> the browser will render
6406533047629. ✖ **Welcome to DBMS course!**

For URL <http://127.0.0.1:5000/login> the browser will render
6406533047630. ✖ **Welcome to MAD-I course!**

For URL <http://127.0.0.1:5000/login?uname> the browser will render
6406533047631. ✓ **Bad Request: Invalid Username**

For URL <http://127.0.0.1:5000/login?uname=CS2006> the browser will
6406533047632. ✓ render **Welcome to MAD-II course!**

Sub-Section Number :

6

Sub-Section Id :

640653134334

Question Shuffling Allowed :

Yes

Question Number : 180 Question Id : 640653905196 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following flask application.

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

@app.route('/home')
def home():
    var_a = request.args.get('method')
    if var_a == "GET":
        return "Hello from GET method"

    elif var_a == "POST":
        return "Hello from POST method"

    else:
        return "Invalid Method"

app.run(debug=True)
```

If the application is running locally on `http://127.0.0.1:5000` then which of the following statements are correct?

Options :

The command `curl -X GET http://127.0.0.1:5000/home?method=GET` will give output
6406533047617. ✓ as `Hello from GET method` on terminal

The command `curl -X POST http://127.0.0.1:5000/home?method=POST` will give output
6406533047618. ✓ as `Method not Allowed` on terminal

The command `curl -X POST http://127.0.0.1:5000/home?method=POST` will give output
6406533047619. ✗ output as `Hello from POST method` on terminal

The command `curl -X POST http://127.0.0.1:5000/home?method` will give output as
6406533047620. ✗ `Invalid Method` on terminal

Question Number : 181 Question Id : 640653905218 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following flask_sqlalchemy data models "User" and "Role".

```
class User(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    username= db.Column(db.String(), unique=True, nullable=False)
    password = db.Column(db.String(), nullable=False)
    email= db.Column(db.String())
    roles= db.relationship("Role", backref="bearer")

class Role(db.Model):
    id = db.Column(db.Integer, primary_key=True)
    r_name = db.Column(db.String(), unique=True, nullable=False)
    user = db.Column(db.Integer, db.ForeignKey("user.id"))
```

python shell:

```
>>> from app import *
>>> db.create_all()
>>> user1 = User(username="Rakesh",password="1234",email="user1@gmail.com")
>>> user2 = User(username="Suresh",password="123",email="user2@gmail.com")
>>> db.session.add_all([user1,user2])
>>> db.session.commit()
>>> r1=Role(r_name="instructor",user=1)
>>> r2=Role(r_name="admin",user=1)
>>> r3=Role(r_name="ops",user=2)
>>> r4=Role(r_name="student",user=2)
>>> db.session.add_all([r1,r2,r3,r4])
>>> db.session.commit()
>>> users = User.query.all()
>>> roles = Role.query.all()
```

If the above commands are run in the python shell then which of the following options is /are correct with respect to these models?

Options :

6406533047701. ❌ Command: >>> users
Output: ["Ramesh", "Suresh"]

6406533047702. ✓ Command: >>> u1 = users[1]
>>> u1.roles
Output: [<Role 3>, <Role 4>]

6406533047703. ❌ Command: >>> roles[2].user
Output: ["Suresh"]

Command: >>> roles[3].user
6406533047704. ✓ Output: 2

Command: >>> roles[0].bearer
6406533047705. ✓ Output: <User 1>

Question Number : 182 Question Id : 640653905224 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Suppose a request <https://xyz.com?name=amey&age=34> generates the below response on the browser's console,

```
Name : amey
```

The definition of the flask endpoint which handles the above request is given below,

```
@app.route(code1)
def getData():
    data = code2
    print("Name :", data)
```

Which of the following options should be used to fill the placeholders "code1" and "code2", to achieve the desired result as shown above?

Options :

6406533047726. ✘
Code1: "/"
Code2: request.form['name']

6406533047727. ✘
Code1: "/", methods = ['GET']
Code2: request.form['name']

6406533047728. ✓
Code1: "/", methods = ['GET', 'POST']
Code2: request.args['name']

6406533047729. ✓
Code1: "/"
Code2: request.args.get('name')

Sub-Section Id :

640653134335

Question Shuffling Allowed :

Yes

Question Number : 183 Question Id : 640653905208 Question Type : MSQ Calculator : Yes

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following function to be tested and test functions given in the Python code snippet below.

test_file.py

```
import pytest

def square(x):
    sum = 0
    for counter in range(x):
        sum += x
    return sum

@pytest.mark.marker1
def testcase_1():
    assert square(10) == 100

@pytest.mark.marker2
def testcase_2():
    assert square(4) == 4

@pytest.mark.marker3
def testcase_3():
    assert square(5) == 25

@pytest.mark.marker4
def testcase_4():
    assert square(6) == 6
```

On running this file on the terminal using pytest, the summary of the output is;

```
===== 1 passed, 3 deselected, 4 warnings in 0.04s =====
```

What command will result into the outcome given above?

Options :

640653047661. ✓ pytest test_file.py -m marker4

6406533047662. ✘

```
pytest test_file.py -m marker1
```

6406533047663. ✓

```
pytest test_file.py -m marker2
```

6406533047664. ✘

```
pytest test_file.py -m marker3
```

Question Number : 184 Question Id : 640653905215 Question Type : MSQ Calculator : Yes

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following flask application.

```

from flask import Flask, abort
app = Flask(__name__)
modules = ['python', 'react', 'node']

@app.route('/home/modules/')
def all_modules():
    return f"<h3>List of modules: {modules}</h3>"

@app.route('/get/<string:module_1>')
def get_module(module_1):
    if module_1 in modules:
        return f"<h3>One module found: {module_1}.</h3>"
    else:
        abort(400)

@app.errorhandler(400)
def module_error(error):
    return "<h3>Cannot find module</h3>"

@app.errorhandler(404)
def module_error(error):
    return "<h3>Incorrect Path</h3>"

app.run(debug=True)

```

If the application is running locally on `http://127.0.0.1:5000`, select the correct statement(s).

Options :

For the URL, `http://127.0.0.1:5000/home/modules`, the browser will render;
✓ 6406533047689. **List of modules: ['python', 'react', 'node']**

For the URL, `http://127.0.0.1:5000/home/modules`, the browser will render;
✗ 6406533047690. **Incorrect Path**

For the URL, `http://127.0.0.1:5000/get/vuejs`, the browser will render;
✓ 6406533047691. **Cannot find module**

For the URL, `http://127.0.0.1:5000/get/react/`, the browser will render;
✗ 6406533047692. **One module found: react.**

Question Number : 185 Question Id : 640653905221 Question Type : MSQ Calculator : Yes

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following code snippet.

```
@app.route('/student/<student_id>')
def profile(student_id):
    # CODE BLOCK HERE
```

Assume the database has a "student" table which has a TEXT column "student_id". If we want the server to return a 404 status code when a user goes to the route '/student/<student_id>' with a student_id that does not exist in the database, which of the following lines would give us the desired output?

Options :

```
student = Student.query.filter_by(student_id=student_id).first()
if student is None:
    abort(404)
return render_template('profile.html', student=student)
```

6406533047714. ✓

```
student = Student.query.filter_by(student_id=student_id).first()
if student is None:
    return render_template("404.html")
return render_template('profile.html', student=student)
```

6406533047715. ✘

```
student = Student.query.filter_by(student_id=student_id).first_or_404()
return render_template('profile.html', student=student)
```

6406533047716. ✓

```
student = Student.query.filter_by(student_id=student_id).first()
if student is None:
    return render_template("404.html"), 404
return render_template('profile.html', student=student)
```

6406533047717. ✓

Sub-Section Number :

8

Sub-Section Id :

640653134336

Question Shuffling Allowed :

No

Question Id : 640653905197 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (186 to 187)

Question Label : Comprehension

Consider the following flask application running locally on

<http://127.0.0.1:5000>

app.py

```
from flask import Flask, request
import sys
app = Flask(__name__)
data = ["Java", "Application Development", "DBMS"]

@app.route('/course')
def home():
    course = request.args.get('course')
    if course in sys.argv[1]:
        if sys.argv[1] in data:
            return f"Welcome to {sys.argv[1]}!"

    return f"Welcome to {course}!"
else:
    return "Invalid Data"

app.run(debug=True)
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 186 Question Id : 640653905198 Question Type : MSQ Calculator : Yes

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

What should be the code to run the application, and what should be the URL respectively such that the browser gives output as: [Welcome to Application Development!](http://127.0.0.1:5000/course?course=Application Development) ?

Options :

Code: `python app.py Application Development DBMS`

640653047621. ✘ URL: <http://127.0.0.1:5000/course?course=Application Development>

640653047622. ✓

Code: python app.py "Application Development" Java

URL: http://127.0.0.1:5000/course?course=Application

Code: python app.py Application Development DBMS

6406533047623. ✖ URL: http://127.0.0.1:5000/course?course=Application

Code: python app.py "Application Development" DBMS

6406533047624. ✓ URL: http://127.0.0.1:5000/course?course=Application Development

Question Number : 187 Question Id : 640653905199 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the output given by
browser if the application is
run with command

python app.py Application Development DBMS
on terminal with URL:

http://127.0.0.1:5000/course?course=Application Development ?

Options :

6406533047625. ✖ Welcome to Application Development!

6406533047626. ✖ Welcome to DBMS!

6406533047627. ✓ Invalid Data

6406533047628. ✖ Not Found

MLF

Section Id : 64065364167

Section Number : 9

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions :	13
Number of Questions to be attempted :	13
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134337
Question Shuffling Allowed :	No

Question Number : 188 Question Id : 640653905225 Question Type : MCQ Calculator : Yes

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 :

640653047730. ✓ YES

640653047731. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653134338
Question Shuffling Allowed :	No

Question Id : 640653905226 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (189 to 190)

Question Label : Comprehension

A company produces two types of products P_1 and P_2 . The cost price per unit of P_1 and P_2 are ₹2 and ₹3, respectively. The production process requires two types of resources: labor hours and machine hours. Each unit of P_1 requires 2 labor hours and 1 machine hour, while each unit of P_2 requires 1 labor hour and 3 machine hours. The company has constraints on the availability of labor and machine hours, which are 80 and 90 hours, respectively.

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

Sub questions

Question Number : 189 Question Id : 640653905227 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the correct **Primal** optimization problem from the following.

Options :

- Minimize: $3x + 2y$
6406533047732. ❌ Subject to: $2x + y \leq 80, x + 3y \leq 90, x \geq 0, y \geq 0$

- Minimize: $2x + 3y$
6406533047733. ✓ Subject to: $2x + y \leq 80, x + 3y \leq 90, x \geq 0, y \geq 0$

- Minimize: $3x + 2y$
6406533047734. ❌ Subject to: $2x + y \leq 90, x + 3y \leq 80, x \geq 0, y \geq 0$

- Minimize: $2x + 3y$
6406533047735. ❌ Subject to: $2x + y \leq 90, x + 3y \leq 80, x \geq 0, y \geq 0$

Question Number : 190 Question Id : 640653905228 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Find the minimum cost price of the products.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

80

Sub-Section Number : 3

Sub-Section Id : 640653134339

Question Shuffling Allowed : Yes

Question Number : 191 Question Id : 640653905229 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following scenarios involving geographical regions (w.r.t some reference of x - axis and y - axis), which of the following regions represents the convex set in \mathbb{R}^2 .

Options :

6406533047737. ✘ A circular park with one side boundary is a circle of radius of 200 meters and another side boundary is a circle of radius of 300 meters, both centered at the origin.

6406533047738. ✓ City district defined by the region above the x-axis within a radius of 10 miles from the origin, forming a semicircle.

6406533047739. ✓ A triangular region with vertices at (0, 0), (1, 0), and (0, 1).

6406533047740. ✘ A path consisting of two connected line segments (forming the boundaries of the path on either sides) formed a "V" shape with vertices at (0, 0), (2, 2), and (2, 0)

Question Number : 192 Question Id : 640653905230 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is/are true?

Options :

6406533047741. ✘ $f(x) = (x^2 - 3x + 2)(x^2 - 7x + 12)$ is a convex function.

6406533047742. ✓ $f(v) = v^T Av$ is a convex function, where $A = \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$ and $v = \begin{bmatrix} x \\ y \end{bmatrix}$.

6406533047743. ✓ $f(x, y) = x^2 + y^2 + 3$ is a convex function.

6406533047744. ✓ $f(v) = v^T Av$ is a convex function, where $A = \begin{bmatrix} 2 & 0 \\ 0 & 1 \end{bmatrix}$ and $v = \begin{bmatrix} x \\ y \end{bmatrix}$.

Sub-Section Number :

4

Sub-Section Id :

640653134340

Question Shuffling Allowed :

Yes

Question Number : 193 Question Id : 640653905231 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

A farmer has 120 meters of fencing and wants to fence off a rectangular field that borders a straight river. The farmer does not need to fence along the river. Find the maximum possible fenced area of the field.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Number : 194 Question Id : 640653905235 Question Type : SA Calculator : None**Correct Marks : 3**

Question Label : Short Answer Question

Suppose a random variable X has a mean μ of 70 and a standard deviation σ of 8. Using Chebyshev's inequality, determine the maximum probability that X will deviate from the mean by more than 16 units. Enter the answer correct to two decimal places.

Response Type : Numeric**Evaluation Required For SA : Yes****Show Word Count : Yes****Answers Type : Equal****Text Areas : PlainText****Possible Answers :**

0.25

Question Number : 195 Question Id : 640653905239 Question Type : SA Calculator : None**Correct Marks : 3**

Question Label : Short Answer Question

Consider the following input data points:

x	y
[2, 3, 4]	9
[-1, 1, 2]	2
[4, 2, 2]	7
[0, -2, -1]	-4
[-3, 5, -2]	4

Suppose we fit a linear model $f(\mathbf{x}) = x_1 + 2x_2 + x_3$, where $\mathbf{x} = (x_1, x_2, x_3)$. Compute the value of the loss function L for this dataset which is defined as $L = \frac{1}{n} \sum_{i=1}^n (f(\mathbf{x}^i) - y^i)^2$.

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 :**

4.2

Question Number : 196 Question Id : 640653905240 Question Type : SA Calculator : None**Correct Marks : 3**

Question Label : Short Answer Question

Let X and Y be two independent random variables, where $X \sim \text{Normal}(-1, 1)$ and $Y \sim \text{Normal}(1, 9)$. Define $U = 2X - 3Y$. Find the value of $P(U > 2)$. Enter the answer correct to three decimal places.

Hint: Use the following values of F_Z if required. F_Z stands for the CDF of the standard normal.

- $F_Z(0.62) = 0.7343$
- $F_Z(-0.62) = 0.2656$
- $F_Z(1.25) = 0.8947$
- $F_Z(-1.25) = 0.1052$

Response Type : Numeric**Evaluation Required For SA : Yes****Show Word Count : Yes****Answers Type : Range****Text Areas : PlainText****Possible Answers :**

0.262 to 0.268

Sub-Section Number :

5

Sub-Section Id :

640653134341

Question Shuffling Allowed :

Yes

Question Number : 197 Question Id : 640653905232 Question Type : MSQ Calculator : Yes**Correct Marks : 4 Max. Selectable Options : 0****Question Label : Multiple Select Question**

Consider a square matrix A of order 3 such that $\text{trace}(A) = 3$ and $\det(A) = 2$. If 1 is an eigenvalue of A , then which of the following options is/are true?

Options :

640653047746. ❌ Matrix A is symmetric matrix.

640653047747. ❌ Matrix A is Hermitian matrix.

640653047748. ✓ 1 + i is an eigenvalue of A .

640653047749. ❌ 2 - i is an eigenvalue of A .

640653047750. ✓ Matrix A is diagonalizable.

Question Number : 198 Question Id : 640653905234 Question Type : MSQ Calculator : Yes**Correct Marks : 4 Max. Selectable Options : 0****Question Label : Multiple Select Question**

Suppose we have 10 data points randomly distributed in space, \mathbb{R}^3 given by $D = \{x_1, x_2, \dots, x_{10}\}$. Let $g(p) = \sum_{i=1}^{10} \|p - x_i\|^2$ be a function defined to calculate the sum of the square of distances of data points from a fixed point, say $p \in \mathbb{R}^3$. If $g(p)$

attains the minimum at $q = \begin{bmatrix} 4 \\ 0 \\ 3 \end{bmatrix}$, then which of the following options is true?

Options :

$$x_1 + x_2 + \dots + x_{10} = \begin{bmatrix} 30 \\ 0 \\ 40 \end{bmatrix}$$

6406533047755. *

$$x_1 + x_2 + \dots + x_{10} = \begin{bmatrix} 40 \\ 0 \\ 30 \end{bmatrix}$$

6406533047756. ✓

6406533047757. ✓ The distance of point $(x_1 + x_2 + \dots + x_{10})$ from the origin is 50.

6406533047758. * The distance of point $(x_1 + x_2 + \dots + x_{10})$ from the origin is 40.

Sub-Section Number :

6

Sub-Section Id :

640653134342

Question Shuffling Allowed :

Yes

Question Number : 199 Question Id : 640653905233 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are true about PCA?

Options :

6406533047751. ✓ PCA will transform the original data set onto a lower dimension subspace such that the variance of the project is maximized.

6406533047752. * PCA calculates the mean of each data set to determine its significance.

6406533047753. ✓ PCA can be used to reduce the dimensionality of the dataset.

6406533047754. * PCA will transform the original data set onto a lower dimension subspace such that the reconstruction error is maximized.

Sub-Section Number :

7

Sub-Section Id :

640653134343

Question Shuffling Allowed :

No

Question Id : 640653905236 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (200 to 201)

Question Label : Comprehension

Let X and Y have the following joint density function

$$f(x, y) = \begin{cases} 18x^2y^2 & x, y \geq 0, x + y \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 200 Question Id : 640653905237 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Find the conditional distribution $f_{X|Y}(x | y)$.

Options :

6406533047760. ❌ $f_{X|Y}(x | y) = \frac{3x^2}{(1-y)^3}, 0 < x < 1$

6406533047761. ✓ $f_{X|Y}(x | y) = \frac{3x^2}{(1-y)^3}, 0 < x < 1-y$

6406533047762. ❌ $f_{X|Y}(x | y) = 3x^2(1-y)^3, 0 < x < 1$

6406533047763. ❌ $f_{X|Y}(x | y) = 3x^2(1-y)^3, 0 < x < 1-y$

Question Number : 201 Question Id : 640653905238 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

Find the value of $P\left(X < \frac{1}{2} | Y = \frac{1}{2}\right)$.

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 :	640653134344
Question Shuffling Allowed :	Yes

Question Number : 202 Question Id : 640653905241 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Let $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{pmatrix}$. Find the nullspace of A .

Options :

6406533047767. ✓ $\text{span} \left\{ \begin{pmatrix} 1 \\ -2 \\ 1 \end{pmatrix} \right\}$

6406533047768. ✗ $\text{span} \left\{ \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} \right\}$

6406533047769. ✗ $\left\{ \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} \right\}$

6406533047770. ✗ $\text{span} \left\{ \begin{pmatrix} 1 \\ 2 \\ 0 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \\ 1 \end{pmatrix} \right\}$

Java

Section Id :	64065364168
Section Number :	10
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	24
Number of Questions to be attempted :	24
Section Marks :	100
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No

Enable Mark as Answered Mark for Review and Clear Response : No

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 640653134345

Question Shuffling Allowed : No

Question Number : 203 Question Id : 640653905242 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : PROGRAMMING CONCEPTS USING JAVA (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 :

640653047771. ✓ YES

640653047772. ✘ NO

Sub-Section Number : 2

Sub-Section Id : 640653134346

Question Shuffling Allowed : Yes

Question Number : 204 Question Id : 640653905243 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Monitor {  
    public void screenSize() {  
        System.out.println("Normal screen size");  
    }  
    public void resolution() {  
        System.out.println("Normal resolution");  
    }  
}  
class LCD extends Monitor {  
    public void screenSize() {  
        System.out.println("Screen size is large");  
    }  
}  
class LED extends Monitor {  
    public void screenSize() {  
        System.out.println("Screen size is medium");  
    }  
    public void resolution() {  
        System.out.println("HD resolution");  
    }  
}  
public class Test {  
    static void show(Monitor[] monitors) {  
        for (int i = 0; i < monitors.length; i++) {  
            monitors[i].screenSize();  
            monitors[i].resolution();  
        }  
    }  
    public static void main(String[] args) {  
        Monitor[] monitors = {new LCD(), new LED()}; // LINE 1  
        show(monitors);  
    }  
}
```

Choose the correct option.

Options :

This code generates the output:

Screen size is medium
HD resolution
Screen size is medium

6406533047773. ✘ HD resolution

6406533047774. ✘

This code generates the output:

```
Normal screen size  
Normal resolution  
Normal screen size  
Normal resolution
```

This code generates the output:

```
Screen size is large  
Normal resolution  
Screen size is medium
```

6406533047775. ✓ HD resolution

Compilation error at LINE 1 because a reference variable of type Monitor can-

6406533047776. ❌ not refer to an object of class LED

Question Number : 205 Question Id : 640653905244 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the code given below that checks whether two candidates are from the same college. Method `equals` is overridden to compare two `Candidate` objects as follows. If two candidates are from the same college then they are said to be equal. Based on the given information, answer the question that follows.

```
class Candidate {  
    private String name;  
    private String college;  
    // Constructor to initialize instance variables  
    public String toString() {  
        return name;  
    }  
  
    public boolean equals(Object obj) {  
        // CODE BLOCK  
    }  
}  
  
public class Test {  
    public static void main(String[] args) {  
        Candidate c1 = new Candidate("Shreya", "IITMadras");  
        Candidate c2 = new Candidate("Hari", "IITDelhi");  
        Candidate c3 = new Candidate("Aisha", "IITMadras");  
        if (c1.equals(c3)) {  
            System.out.println(c1 + " and " + c3 + " belong to the same college");  
        }  
        if (c2.equals(c3)) {  
            System.out.println(c2 + " and " + c3 + " belong to the same college");  
        }  
    }  
}
```

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

Shreya and Hari belong to the same college

Options :

```
if(obj instanceof Candidate) {  
    if(this.college.equals(obj.college))  
        return true;  
}  
6406533047777. ✘ return false;  
  
if(this.college.equals(obj.college))  
    return true;  
6406533047778. ✘ return false;  
  
6406533047779. ✓
```

```
if(obj instanceof Candidate) {  
    Candidate c = (Candidate) obj;  
    if(this.college.equals(c.college))  
        return true;  
}  
return false;  
  
if(obj instanceof Candidate) {  
    Candidate c = obj;  
    if(this.college.equals(c.college))  
        return true;  
}  
6406533047780. ✘ return false;
```

Question Number : 206 Question Id : 640653905245 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Intern {  
    private String name;  
    public Intern(String n) {  
        name = n;  
    }  
    public Intern(Intern i) {  
        this.name = i.name;  
    }  
    public void setName(String n) {  
        name = n;  
    }  
    public String getName() {  
        return name;  
    }  
}  
public class Test {  
    public static void main(String[] args) {  
        Intern i1 = new Intern("Jaya");  
        Intern i2 = new Intern(i1);  
        Intern i3 = i1;  
        i1.setName("Subash");  
        System.out.println(i1.getName());  
        System.out.println(i2.getName());  
        System.out.println(i3.getName());  
    }  
}
```

What will the output be?

Options :

Subash
Jaya

6406533047781. ❌ Jaya

Subash
Jaya

6406533047782. ✓ Subash

Subash
Subash

6406533047783. ❌ Subash

Subash
Subash

6406533047784. ❌ Jaya

Question Number : 207 Question Id : 640653905246 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the code given below.

```
class Device {  
    public void powerOn() {  
        System.out.println("Device is on");  
    }  
}  
  
class Mobile extends Device {  
    public void display() {  
        System.out.println("Mobile display");  
    }  
}  
  
class Smartphone extends Mobile {  
    public void display() {  
        System.out.println("Smartphone display");  
    }  
    public void connect() {  
        System.out.println("Connected to Internet");  
    }  
}  
  
public class TestDevice {  
    public static void main(String[] args) {  
        Device d = new Mobile();  
        Mobile m = new Smartphone(); // LINE 1  
        d.powerOn();  
        ((Mobile)d).display(); // LINE 2  
        m.connect(); // LINE 3  
    }  
}
```

Choose the correct option.

Options :

LINE 1 generates a compilation error because a variable of type `Mobile` cannot refer to an object of type `Smartphone`.
6406533047785. ❌

LINE 2 generates a compilation error because a variable of type `Device` cannot be type cast to an object of type `Mobile`.
6406533047786. ❌

6406533047787. ✓

LINE 3 generates a compilation error because the method `connect()` is not defined in class `Mobile`.

This code generates the output:

Device is on
Mobile display
6406533047788. ✖ Connected to Internet

Question Number : 208 Question Id : 640653905247 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.util.*;  
public class Test{  
    public static void main(String[] args) {  
        ArrayDeque<String> queue1 = new ArrayDeque<String>();  
        queue1.add("Violet");  
        queue1.addFirst("Yellow");  
        queue1.add("Pink");  
        queue1.addFirst("Blue");  
        queue1.add("Blue");  
        System.out.println(queue1);  
        TreeSet<String> set = new TreeSet<String>(queue1);  
        System.out.println(set);  
    }  
}
```

What will the output be?

Options :

This program generates the output:

[Blue, Yellow, Violet, Pink, Blue]

6406533047789. ✓ [Blue, Pink, Violet, Yellow]

This program generates the output:

[Blue, Pink, Violet, Yellow]

6406533047790. ✖ [Blue, Yellow, Violet, Pink, Blue]

This program generates the output:

[Blue, Pink, Violet, Yellow]

6406533047791. ✖ [Blue, Pink, Violet, Yellow]

This program generates the output:

[Blue, Yellow, Violet, Pink, Blue]

6406533047792. ✶ [Blue, Yellow, Violet, Pink, Blue]

Question Number : 209 Question Id : 640653905248 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Chef {  
    String name;  
    public Chef(String n) {  
        name = n;  
    }  
}  
  
class Dish implements Cloneable {  
    String dishName;  
    Chef[] chefs;  
    public Dish(String name, Chef[] chefs) {  
        dishName = name;  
        this.chefs = chefs;  
    }  
    public Dish clone() throws CloneNotSupportedException {  
        Dish d = (Dish) super.clone();  
        d.chefs = this.chefs.clone();  
        return d;  
    }  
}  
  
public class Test {  
    public static void main(String[] args) throws CloneNotSupportedException {  
        Chef[] chefs1 = { new Chef("Ravi"), new Chef("Raju") };  
        Dish d1 = new Dish("Biryani", chefs1);  
        Dish d2 = d1.clone();  
        Chef[] chefs2 = d2.chefs;  
        chefs2[0].name = "Veena";  
        d2.dishName = "Fried Rice";  
  
        System.out.println(d1.dishName + " : " + d1.chefs[0].name);  
        System.out.println(d2.dishName + " : " + d2.chefs[0].name);  
    }  
}
```

What will the output be?

Options :

Biryani : Veena
6406533047793. ✘ Biryani : Veena

FriedRice : Veena
6406533047794. ✘ FriedRice : Veena

Biryani : Ravi
6406533047795. ✘ FriedRice : Veena

Biryani : Veena
6406533047796. ✓ FriedRice : Veena

Question Number : 210 Question Id : 640653905249 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.util.*;
public class Test {
    public static void main(String[] args) {
        List<String> list = new ArrayList<String>();
        list.add("Date");
        list.add("Durian");
        list.add("Banana");
        list.add("Cherry");
        list.add("Dragonfruit");

        list.stream().takeWhile(s -> s.startsWith("D"))
            .forEach(s -> System.out.print(s + " "));

        System.out.println();

        list.stream().dropWhile(s -> s.startsWith("D"))
            .forEach(s -> System.out.print(s + " "));

    }
}
```

What will the output be?

Options :

Date Durian Dragonfruit
6406533047797. ✘ Banana Cherry

Date Durian

6406533047798. ✘ Banana Cherry

Date Durian

6406533047799. ✓ Banana Cherry Dragonfruit

6406533047800. ✘ Date Durian Banana Cherry Dragonfruit

Question Number : 211 Question Id : 640653905252 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
1 class ClassOne{
2     public void methodOne(){
3         // ...
4         methodTwo();
5         // ...
6     }
7     public void methodTwo(){
8         // ...
9     }
10 }
11 class ClassTwo{
12     public static void methodThree(){
13         // ...
14         ClassOne c = new ClassOne();
15         c.methodOne();
16         // ...
17     }
18     public static void methodFour(){
19         // ...
20         methodThree();
21         // ...
22     }
23     public static void main(String[] args) {
24         // ...
25         methodFour();
26     }
27 }
```

During the execution of Line 16 in the above code, the activation record of which method is at the top of the stack of activation records?

Options :

6406533047809. ✘ main

6406533047810. ✘ methodOne

6406533047811. ✘ methodTwo

6406533047812. ✓ methodThree

6406533047813. ✘ methodFour

Question Number : 212 Question Id : 640653905253 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
interface TransportService {  
    void bookRide();  
}  
class TransportApp {  
    public TaxiService getTaxiService() {  
        return new TaxiService();  
    }  
    public BusService getBusService() {  
        return new BusService();  
    }  
    private class TaxiService implements TransportService {  
        public void bookRide() {  
            System.out.println("Booking a taxi");  
        }  
    }  
    private class BusService implements TransportService {  
        public void bookRide() {  
            System.out.println("Booking a bus");  
        }  
    }  
}  
public class Test {  
    public static void main(String[] args) {  
        TransportApp t = new TransportApp();  
        //CODE BLOCK  
        obj1.bookRide();  
        obj2.bookRide();  
    }  
}
```

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

Booking a taxi
Booking a bus

Options :

640653047814. ❌ TaxiService obj1 = new TaxiService();
640653047814. ❌ BusService obj2 = new BusService();

6406533047815. ✓ TransportService obj1 = t.getTaxiService();
6406533047815. ✓ TransportService obj2 = t.getBusService();

640653047816. ❌ TaxiService obj1 = t.getTaxiService();
640653047816. ❌ BusService obj2 = t.getBusService();

TransportService obj1 = new TaxiService();
6406533047817. ❌ TransportService obj2 = new BusService();

Question Number : 213 Question Id : 640653905254 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
interface OnlineCourse {  
    default void showDetails() {  
        System.out.println("Course duration is 3 months");  
    }  
    default void enroll() {  
        System.out.println("Enrolled");  
    }  
}  
class CloudCourse implements OnlineCourse { //LINE 1  
    public void enroll() {  
        System.out.println("Enrolled in cloud course");  
    }  
}  
class MLCourse implements OnlineCourse { //LINE 2  
    public void showDetails() {  
        System.out.println("ML Course");  
    }  
}  
public class Test {  
    public static void main(String[] args) {  
        OnlineCourse courses[] = new OnlineCourse[2];  
        courses[0] = new CloudCourse();  
        courses[1] = new MLCourse();  
        for (OnlineCourse course : courses) {  
            course.showDetails();  
            course.enroll();  
        }  
    }  
}
```

Choose the correct option.

Options :

Compilation error at LINE 1 because method showDetails() is not overridden
6406533047818. ❌ in class CloudCourse

Compilation error at LINE 2 because method `enroll()` is not overridden in
6406533047819. ❌ class `MLCourse`

This program generates the output:

Enrolled in cloud course

6406533047820. ❌ ML Course

This program generates the output:

Course duration is 3 months

Enrolled in cloud course

`MLCourse`

6406533047821. ✓ Enrolled

Question Number : 214 Question Id : 640653905255 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
abstract class Bag {  
    abstract void open();  
    void carry() { // LINE 1  
        System.out.println("Carrying bag");  
    }  
}  
class Backpack extends Bag {  
    void open() {  
        System.out.println("Opening backpack");  
    }  
    void carry() {  
        System.out.println("Wearing backpack");  
    }  
}  
class ToteBag extends Bag {  
    void open() {  
        System.out.println("Opening tote bag");  
    }  
    void carry() {  
        System.out.println("Holding tote bag");  
    }  
}  
public class Test {  
    public static void main(String[] args) {  
        Bag bag1 = new Backpack(); // LINE 2  
        Bag bag2 = new ToteBag(); // LINE 3  
        bag1.carry();  
        bag1.open();  
        bag2.carry();  
        bag2.open();  
    }  
}
```

Choose the correct option.

Options :

LINE 1 generates compilation error because abstract class must contain only
6406533047822. ✘ abstract methods.

LINE 2 and LINE 3 generate compilation errors because reference variable of
6406533047823. ✘ type Bag cannot store the objects of type Backpack and ToteBag.

6406533047824. ✓

This program generates the output:

Wearing backpack

Opening backpack

Holding tote bag

Opening tote bag

This program generates the output:

Carrying bag

Opening backpack

Carrying bag

6406533047825. ❌ Opening tote bag

Question Number : 215 Question Id : 640653905256 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
interface Iterator{
    public boolean has_next();
    public Object get_next();
}

abstract class Printable{
    public abstract void print();
}

class ProductList{
    private final int limit = 3;
    private Product[] list = { new Product("Laptop", "P1001"),
        new Product("Smartphone", "P1002"),
        new Product("Smartwatch", "P1003")
    };
    private class Product extends Printable{
        private String name, productId;
        //Constructor to initialize instance variables
        public void print() {
            System.out.println(productId + ", " + name);
        }
    }
    private class ProdIter implements Iterator{
        private int indx;
        public ProdIter() {
            //constructor
        }
        public boolean has_next() {
            //if next element available in list return true;
            //else false
        }
        public Object get_next() {
            //return next element from list
        }
    }
    public Iterator getIterator() {
        return new ProdIter();
    }
}
```

```
public class IterTest {  
    public static void main(String[] args) {  
        ProdList pList = new ProdList();  
        Iterator iter = pList.getIterator();  
        while(iter.has_next()) {  
            -----; //LINE 1  
        }  
    }  
}
```

Identify the appropriate statement to fill in the blank at LINE 1, such that the output is:

P1001, Laptop
P1002, Smartphone
P1003, Smartwatch

Options :

6406533047826. ✓ ((Printable)iter.get_next()).print()

6406533047827. ✗ ((Product)iter.get_next()).print()

6406533047828. ✗ ((ProdList)iter.get_next()).print()

6406533047829. ✗ iter.get_next().print();

Question Number : 216 Question Id : 640653905258 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.util.*;
class ZeroValueException extends Exception {
    public String toString() {
        return "Zero encountered during update";
    }
}
public class Test {
    public static void update(int[] array, int index) throws ZeroValueException
    {
        if (array[index] == 0) {
            throw new ZeroValueException();
        }
        array[index] = array[index] * 5;
    }
    public static void main(String[] args) {
        int[] arr = {1, -1, 0, 2, -2};
        try {
            for (int i = 0; i < arr.length; i++) {
                update(arr, i);
            }
        } catch (ZeroValueException e) {
            System.out.println(e);
        }
        for (int n : arr) {
            System.out.print(n + " ");
        }
    }
}
```

What will the output be?

Options :

6406533047834. ❌ Zero encountered during update

6406533047835. ❌ 5 -5 0 2 -2

Zero encountered during update

6406533047836. ❌ 5 -5

Zero encountered during update

6406533047837. ✓ 5 -5 0 2 -2

Correct Marks : 4

Question Label : Multiple Choice Question

Method `Optional.ofNullable(T value)` returns an `Optional` that describes the specific value, if non-null; otherwise returns an empty `Optional`.

Based on this description, consider the code given below, and answer the question that follows.

```
import java.util.*;
class Movie {
    HashMap<String, String> actors = new HashMap<>();
    public Movie() {
        actors.put("Action", "Akshay");
        actors.put("Comedy", "Kapil");
    }
    public String getActor(String genre) {
        return actors.get(genre);
    }
}
public class Test {
    public static void main(String[] args) {
        Optional<String> a1 = Optional.ofNullable(new Movie().getActor("Action"));
        Optional<String> a2 = Optional.ofNullable(new Movie().getActor("Thriller"));
        a1.ifPresent(n ->System.out.println(n.toUpperCase()));
        a2.ifPresent(n -> System.out.println(n.toUpperCase()));
    }
}
```

Choose the correct option.

Options :

This program generates the output:

6406533047838. ✓ AKSHAY

This program terminates due to `NullPointerException` after printing the message:

6406533047839. ✗ AKSHAY

This program generates the output:

AKSHAY

6406533047840. ✗ null

This program generates the output:

ACTION

6406533047841. ✗ AKSHAY

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.io.*;
class HealthCard implements Serializable {
    private String cardNumber = "*****";
    private transient String insuranceProvider = "Unknown";
    private String issueDate = "00/00";
    public HealthCard(String cN, String iP, String iD) {
        cardNumber = cN;
        insuranceProvider = iP;
        issueDate = iD;
    }
    public String toString() {
        return cardNumber + ", " + insuranceProvider + ", " + issueDate;
    }
}
public class Test {
    public static void main(String[] args) throws Exception {
        var fos = new FileOutputStream("healthcard.txt");
        var os = new ObjectOutputStream(fos);
        os.writeObject(new HealthCard("H123456", "HIInsurance", "03/24"));
        os.close();
        var fis = new FileInputStream("healthcard.txt");
        var ois = new ObjectInputStream(fis);
        HealthCard card = (HealthCard) ois.readObject();
        ois.close();
        System.out.println(card);
    }
}
```

What will the output be?

Options :

640653047842. ✘ null, null, null

640653047843. ✓ H123456, null, 03/24

640653047844. ✘ H123456, Unknown, 03/24

640653047845. ✘ H123456, HIInsurance, 03/24

640653047846. ✘ ******, Unknown, 00/00

Question Number : 219 Question Id : 640653905261 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.util.*;
import java.util.stream.*;
class Car {
    private String model;
    private double mileage;
    //Constructor to initialize instance variables
    public double getMileage() {
        return mileage;
    }
    public String toString() {
        return model;
    }
}
public class Test {
    public static void main(String[] args) {
        var carArr = new ArrayList<Car>();
        carArr.add(new Car("Toyota", 20.5));
        carArr.add(new Car("Ford", 25.3));
        carArr.add(new Car("Honda", 18.9));
        carArr.add(new Car("Chevrolet", 22.0));
        Map<Boolean, List<Car>> mileageMap;
        mileageMap = carArr.stream()
            .collect(Collectors.partitioningBy(c -> c.getMileage() >= 22.0));
        System.out.println(mileageMap.get(false));
    }
}
```

Choose the correct option.

Options :

6406533047847. ❌ This program generates the output: [Ford, Chevrolet]

6406533047848. ❌ This program generates the output: [Ford]

6406533047849. ✓ This program generates the output: [Toyota, Honda]

6406533047850. ❌ This program generates the output: [Toyota, Honda, Chevrolet]

Question Number : 220 Question Id : 640653905262 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the code given below. Assume that the file food.txt contains the following lines of text in it.

A balanced diet is key to good health.

Food provides essential nutrients for the body.

Food preparation is an art form.

```
import java.io.*;
import java.util.Scanner;
public class Example {
    public static void main(String[] args) {
        try {
            var in=new FileInputStream("food.txt");
            var scanner=new Scanner(in); //LINE 1
            System.out.println("Data from file:");
            System.out.println(scanner.nextLine());
            System.out.println(scanner.next());
            System.out.println(scanner.nextLine());
        }
        catch (FileNotFoundException e) {
            System.out.println("File does not exist.");
        }
        catch (IOException e) {
            System.out.println("Error in writing a file.");
        }
    }
}
```

Choose the correct option.

Options :

6406533047851. ❌ LINE 1 generates IOException.

This program generates the output:

Data from file:

A balanced diet is key to good health.

Food provides essential nutrients for the body.

6406533047852. ❌ Food preparation is an art form.

6406533047853. ✓

This program generates the output:

Data from file:

A balanced diet is key to good health.

Food

provides essential nutrients for the body.

This program generates the output:

Data from file:

A balanced diet is key to good health.

A

6406533047854. ❌ Food preparation is an art form.

Sub-Section Number :	3
Sub-Section Id :	640653134347
Question Shuffling Allowed :	Yes

Question Number : 221 Question Id : 640653905251 Question Type : MCQ Calculator : Yes

Correct Marks : 5

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import javax.swing.*;
import java.awt.*;
public class GUITest extends JFrame {
    JPanel pnlLbl, pnlTxt, pnlBtn;
    JLabel lblId, lblPwd;
    JTextField txtId, txtPwd;
    JButton btn;
    public GUITest() {
        lblId = new JLabel("Phone no:");
        lblPwd = new JLabel("OTP:");
        txtId = new JTextField(10);
        txtPwd = new JTextField(10);
        btn = new JButton("Login");
        pnlLbl = new JPanel();
        //add lblId and txtId to pnlLbl
        pnlTxt = new JPanel();
        //add lblPwd and txtPwd to pnlTxt
        pnlBtn = new JPanel();
        //add btn to pnlBtn

        //CODE BLOCK

        setVisible(true);
        setSize(300,200);
    }
    public static void main(String[] args) {
        new GUITest();
    }
}
```

Choose the correct option to be filled in place of CODE_BLOCK such that the above program produces the GUI given below.



Figure 1

Options :

- add(pnlLbl, "Center");
- add(pnlTxt, "North");
- 6406533047805. ✘ add(pnlBtn, "South");

- add(pnlLbl, "North");
- add(pnlTxt, "South");
- 6406533047806. ✘ add(pnlBtn, "Center");

```
    add(pnlLbl, "North");
    add(pnlTxt, "Center");
6406533047807. ✓ add(pnlBtn, "South");
```

```
    add(pnlLbl, "South");
    add(pnlTxt, "Center");
6406533047808. ✘ add(pnlBtn, "North");
```

Sub-Section Number : 4

Sub-Section Id : 640653134348

Question Shuffling Allowed : Yes

Question Number : 222 Question Id : 640653905257 Question Type : MSQ Calculator : Yes

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the Java code given below that prints the highest priced stock among a set of given Stock objects. From among the options, identify the appropriate function header for the function printHighestPricedStock that takes as input an array of Stock objects and prints the highest priced stock.

```
import java.util.*;
interface Stock {
    public abstract double getPrice();
}
class AStock implements Stock {
    private double price;
    // Constructor
    // method getPrice() that returns price
}
class BStock implements Stock {
    private double price;
    // Constructor
    // method getPrice() that returns price
}
public class Test {
    // LINE 1: FUNCTION HEADER
    {
        // invokes method getPrice()
        // to print the value of highest priced stock
    }

    public static void main(String[] args) {
        Stock[] stocks = {
            new AStock(150.50),
            new BStock(200.75),
            new AStock(160.25)
        };
        printHighestPricedStock(stocks);
    }
}
```

Choose the correct option(s).

Options :

6406533047830. ❌ public static <T extends AStock> void printHighestPricedStock(T[] items)

6406533047831. ✓ public static <T extends Stock> void printHighestPricedStock(T[] items)

6406533047832. ❌ public static <T extends BStock> void printHighestPricedStock(T[] items)

6406533047833. ✓ public static void printHighestPricedStock(Stock[] items)

Question Number : 223 Question Id : 640653905264 Question Type : MSQ Calculator : Yes

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the Java code given below.

```
class Stadium {  
    int available = 1;  
    public synchronized void bookSeat(int n, String name) {  
        if (available >= n) {  
            available = available - n;  
            System.out.println(name + " booked " + n + " seat");  
        } else {  
            System.out.println(name + " cannot book " + n + " seat");  
        }  
    }  
}  
  
class SeatBooking implements Runnable {  
    private Stadium s;  
    private String name;  
    private int n_seats;  
    public SeatBooking(Stadium s, String n, int ns) {  
        this.s = s;  
        this.name = n;  
        this.n_seats = ns;  
    }  
    public void run() {  
        s.bookSeat(n_seats, name);  
    }  
}  
  
public class ThreadTest {  
    public static void main(String[] args) {  
        Stadium obj = new Stadium();  
        SeatBooking sb1 = new SeatBooking(obj, "Virat", 1);  
        SeatBooking sb2 = new SeatBooking(obj, "Saniya", 1);  
        Thread t1 = new Thread(sb1);  
        Thread t2 = new Thread(sb2);  
        t1.start();  
        t2.start();  
    }  
}
```

Which of the following options is/are possible result/s of the above code?

Options :

- Saniya booked 1 seat
- 640653047859. ✓ Virat cannot book 1 seat

Saniya booked 1 seat

6406533047860. ✘ Virat booked 1 seat

Virat booked 1 seat

6406533047861. ✓ Saniya cannot book 1 seat

Virat cannot book 1 seat

6406533047862. ✘ Saniya cannot book 1 seat

Question Number : 224 Question Id : 640653905265 Question Type : MSQ Calculator : Yes

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct option.

```
import java.util.*;
import java.util.concurrent.*;
class Example extends Thread {
    Map cuMap;
    Example(Map m) {
        this.cuMap = m;
    }
    public void run() {
        cuMap.put("4", "Four");
    }
}
public class Test {
    public static void main (String[] args) {
        Map<Integer, String> cuMap = new ConcurrentHashMap();
        Integer[] iarr = {1, 2, 3};
        String[] arr = {"One", "Two", "Three"};
        for(int i = 0; i < iarr.length; i++) {
            cuMap.put(iarr[i], arr[i]);
        }
        Example t = new Example(cuMap);
        t.start();
        Set s = cuMap.entrySet();
        Iterator itr = s.iterator();
        while(itr.hasNext()) {
            Map.Entry m = (Map.Entry)itr.next();
            System.out.println(m.getKey() + " => " + m.getValue());
        }
    }
}
```

Which of the following is true about the given code.

Options :

6406533047863. ❌ This program may generate ConcurrentModificationException.

The program may generate the output:

1 => One
2 => Two
3 => Three

6406533047864. ✓ 4 => Four

The program may generate the output:

1 => One
2 => Two

6406533047865. ✓ 3 => Three

The program always generate the output:

1 => One
2 => Two
3 => Three
4 => Four

6406533047866. ✘

Sub-Section Number :

5

Sub-Section Id :

640653134349

Question Shuffling Allowed :

Yes

Question Number : 225 Question Id : 640653905250 Question Type : MSQ Calculator : Yes

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the Java code given below.

```
import javax.swing.*;
import java.awt.event.*;
public class ButtonEventTest extends JFrame implements ActionListener{
    private JButton b1, b2;
    private JLabel l1;
    JPanel panel1, panel2;
    public ButtonEventTest() {
        b1 = new JButton("Encrypt");
        b2 = new JButton("Decrypt");
        panel1 = new JPanel();
        panel1.add(b1);
        panel1.add(b2);
        add(panel1, "South");

        l1 = new JLabel("");
        panel2 = new JPanel();
        panel2.add(l1);
        add(panel2, "North");

        setVisible(true);
        setSize(400, 400);

        b1.setActionCommand("action1");
        b2.setActionCommand("action2");

        b1.addActionListener(this);
        b2.addActionListener(this);
    }

    public void actionPerformed(ActionEvent e) {
        //CODE SEGMENT
    }
}

public static void main(String[] args) {
    new ButtonEventTest();
}
```

Choose the correct code segment(s) to be filled inside method `actionPerformed()` such that on clicking the Encrypt button, the label text changes to Text encrypted and on clicking the Decrypt button, the label text changes to Text decrypted.



Options :

```
if(e.getActionCommand().equals("action1"))
    l1.setText("Text encrypted");
else if(e.getActionCommand().equals("action2"))
    l1.setText("Text decrypted");
```

6406533047801. ✓ l1.setText("Text decrypted");

6406533047802. ✘

```
if(e.getActionCommand().equals("b1"))
    l1.setText("Text encrypted");
else if(e.getActionCommand().equals("b2"))
    l1.setText("Text decrypted");
```

```
        if(e.getSource().equals(b1))
            l1.setText("Text encrypted");
        else if(e.getSource().equals(b2))
            l1.setText("Text decrypted");
```

6406533047803. ✓

```
if(e.getSource().equals("action1"))
    l1.setText("Text encrypted");
else if(e.getSource().equals("action2"))
    l1.setText("Text decrypted");
```

6406533047804. ✘

Question Number : 226 Question Id : 640653905263 Question Type : MSQ Calculator : Yes

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the Java code given below.

```
class Pattern implements Runnable {
    boolean stopRequested = false;
    String[] pattern = {"One", "Two", "Three", "Four", "Five"};
    int index = 0;
    public void run() {
        while (!stopRequested) {
            System.out.print(pattern[index] + " ");
            index = (index + 1) % pattern.length;
        }
    }
    public void setStop(boolean stop) {
        stopRequested = stop;
    }
}
public class Test {
    public static void main(String[] args) throws InterruptedException {
        Pattern p = new Pattern();
        Thread t1 = new Thread(p);
        t1.start();
        p.setStop(true);
    }
}
```

Choose the correct option(s).

Options :

6406533047855. ✘ The program will always generate the output: One Two Three Four Five

6406533047856. ✘ The program will always generate the output: One

The output can be One or One Two or One Two Three or One Two Three Four
6406533047857. ✓ or One Two Three Four Five and can also cycle back and start again.

6406533047858. ✓ The program may not generate any output.

AppDev2

Section Id :	64065364169
Section Number :	11
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	31
Number of Questions to be attempted :	31
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134350
Question Shuffling Allowed :	No

Question Number : 227 Question Id : 640653905266 Question Type : MCQ Calculator : Yes

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 :

640653047867. ✓ YES

640653047868. ✗ NO

Sub-Section Number :

2

Sub-Section Id :

640653134351

Question Shuffling Allowed :

Yes

Question Number : 228 Question Id : 640653905267 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

What of the following is the primary objective of a CSRF token?

Options :

640653047869. ✗ To encrypt the user's session

640653047870. ✓ To validate that the request comes from the authenticated user

640653047871. ✗ To store the user's password securely

640653047872. ✗ To compress the HTTP request

Question Number : 229 Question Id : 640653905271 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Suppose an application is being loaded from the origin https://example.com. Which of the following origins will the browser allow while making a fetch call, by default?

Options :

640653047885. ✗ <https://api.example.com>

640653047886. ✗ <http://example.com/api>

640653047887. ✗ <https://example.com:8080>

640653047888. ✓ <https://example.com/subdir>

Question Number : 230 Question Id : 640653905296 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

What is the correct sequence of steps to update the state in Vuex when handling an asynchronous operation?

Options :

640653047977. ✗ State → Dispatch an action → Commit a mutation → State change

640653047978. ✓ Dispatch an action → Commit a mutation → State change

640653047979. ✗ Commit a mutation → Dispatch an action → State change

640653047980. ❌ State change → Commit a mutation → Dispatch an action

Sub-Section Number : 3

Sub-Section Id : 640653134352

Question Shuffling Allowed : Yes

Question Number : 231 Question Id : 640653905269 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Suppose you are developing an application for millions of users that will perform intensive data analysis and return the results asynchronously. Arrange the following set of actions/operations to achieve an efficient and scalable design.

- I) Save the result to a database
- II) Invoke a callback URL
- III) Queue the analysis job

Options :

640653047877. ❌ II, I, III

640653047878. ✓ III, I, II

640653047879. ❌ III, II, I

640653047880. ❌ I, II, III

Question Number : 232 Question Id : 640653905272 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following statements about Redis is true?

Options :

640653047889. ❌ Redis is a relational database that uses SQL for querying data.

640653047890. ✓ Redis is an in-memory data structure store, commonly used as a database, cache, and message broker.

640653047891. ❌ Redis can only store string data types and does not support complex data structures like lists or sets.

640653047892. ❌ Redis cannot handle numerous operations per second.

Question Number : 233 Question Id : 640653905273 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following scenarios is an example of a Cross-Site Request Forgery (CSRF) attack?

Options :

640653047893. ❌ A user receives an email containing a link to a phishing site that asks for their login credentials.

640653047894. ✓ A user clicks on a malicious link while logged into their bank account, and without their knowledge, a money transfer request is sent to the bank's server using the user's

authenticated session.

6406533047895. ❌ A hacker uses a brute-force attack to guess the password of a user's online account.

6406533047896. ❌ A user is tricked into downloading and installing malware that steals their sensitive information.

Question Number : 234 Question Id : 640653905275 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Match the following technologies with their typical use cases:

1. Webhooks	A. Real-time communication in chat applications
2. Web Sockets	B. Fetching data periodically from an API endpoint
3. API	C. Receiving notifications when a specific event occurs
4. Polling	D. Exchanging data between client and server using HTTP requests
5. Pub/Sub	E. Broadcasting messages to multiple subscribers simultaneously

Options :

6406533047901. ✓ 1 - C, 2 - A, 3 - D, 4 - B, 5 - E

6406533047902. ❌ 1 - D, 2 - E, 3 - A, 4 - C, 5 - B

6406533047903. ❌ 1 - C, 2 - C, 3 - E, 4 - A, 5 - D

6406533047904. ❌ 1 - D, 2 - A, 3 - C, 4 - D, 5 - B

Question Number : 235 Question Id : 640653905282 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below javascript program.

```
function parent() {  
    var a = 1;  
    function child() {  
        console.log(a);  
    }  
    a = 2;  
    return child;  
}  
  
var closure = parent();  
closure();
```

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

Options :

6406533047925. ✓ 2

6406533047926. ❌ 1

640653047927. ✘ undefined

640653047928. ✘ Error

Question Number : 236 Question Id : 640653905292 Question Type : MCQ Calculator : Yes

Correct Marks : 3

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 :

640653047961. ✘ storedUsername: 'course_user', removedUsername: null, clearedStorage: null

640653047962. ✘ storedUsername: 'course_user', removedUsername: undefined, clearedStorage: null

640653047963. ✓ storedUsername: 'course_user', removedUsername: null, clearedStorage: undefined

640653047964. ✘ storedUsername: 'course_user', removedUsername: undefined, clearedStorage: undefined

Question Number : 237 Question Id : 640653905295 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following javascript code

```
const obj = {
    num: 40,
    regularFunction: function() {
        return this.value;
    },
    arrowFunction: () => {
        return this.value;
    }
};

const regularResult = obj.regularFunction();
const arrowResult = obj.arrowFunction();
```

What are the values of `regularResult` and `arrowResult`?

Options :

6406533047973. ✘ `regularResult = 40, arrowResult = 40`

6406533047974. ✘ `regularResult = undefined, arrowResult = undefined`

6406533047975. ✓ `regularResult = 40, arrowResult = undefined`

6406533047976. ✘ `regularResult = undefined, arrowResult = 40`

Question Number : 238 Question Id : 640653905297 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below 2 approaches:

Approach 1:

```
<script>
    setInterval(() => document.title = "Title A", 2000)
    setInterval(() => document.title = "Title B", 1000)
</script>
```

Approach 2:

```
<script>
    setInterval(() => document.title = "Title A", 1000)
    setInterval(() => document.title = "Title B", 2000)
</script>
```

Choose the correct statement:

Options :

6406533047981. ✘ The approach 1 will toggle the page title between "Title A" and "Title B" after every 1 second (approx).

6406533047982. ✘ The approach 2 will toggle the page title between "Title A" and "Title B" after

every 1 second (approx).

6406533047983. ✓ None of the approaches will toggle the page title after every 1 second.

6406533047984. ✗ None of these

Question Number : 239 Question Id : 640653905299 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below JavaScript program.

```
<script>
  for (var i = 0; i <= 3; i++) {
    setTimeout(() => console.log(i), (i+1)*1500);
  }
</script>
```

What will be the output of the above program, if executed? Also, predict the minimum number of seconds the program will take to complete the execution?

Options :

0
1
2
3

6406533047989. ✗ Minimum time taken will be: 15 sec

1
2
3
4

6406533047990. ✗ Minimum time taken will be: 9 sec

3
3
3
3

6406533047991. ✗ Minimum time taken will be: 6 sec

6406533047992. ✓

4
4
4
4

Minimum time taken will be: 6 sec

Sub-Section Number :	4
Sub-Section Id :	640653134353
Question Shuffling Allowed :	Yes

Question Number : 240 Question Id : 640653905268 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statement(s) is/are true about webhooks?

Options :

6406533047873. ✓ Webhooks use HTTP requests to communicate events from one service to another.

6406533047874. ✗ Webhooks require the recipient service to periodically poll the sender for updates.

6406533047875. ✓ Webhooks are typically implemented using HTTP POST requests.

6406533047876. ✗ Webhooks guarantee that events will be delivered in order and exactly once.

Question Number : 241 Question Id : 640653905270 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statement(s) is/are true regarding javascript?

Options :

6406533047881. ✓ Function declarations are hoisted along with their definitions.

6406533047882. ✗ Variable declarations with var are hoisted with their initializations.

6406533047883. ✓ let and const declarations are hoisted to the top of their block but remain uninitialized until execution reaches the declaration.

6406533047884. ✗ Only function declarations are hoisted, not function definition.

Question Number : 242 Question Id : 640653905274 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following scenarios are best suited for using Celery tasks?

Options :

6406533047897. ✗ Handling real-time user interactions on a website.

6406533047898. ✓ Sending out periodic email notifications to users.

640653047899. ❌ Generating and displaying dynamic content on a web page.

640653047900. ✓ Performing long-running data processing tasks in the background.

Question Number : 243 Question Id : 640653905293 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true regarding webhooks and server sent events (SSE)?

Options :

640653047965. ✓ Webhooks are typically used for server-to-server communication, while SSE is used for server-to-client communication.

640653047966. ❌ Webhooks require the client to maintain an open connection to receive updates, while SSE does not.

640653047967. ✓ Webhooks are initiated by the server, while SSE connections are initiated by the client.

640653047968. ❌ SSE supports bidirectional communication, whereas webhooks do not.

Question Number : 244 Question Id : 640653905298 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are the correct ways to achieve the following.

1. Always apply class named “errorClass”,

2. The class named “activeClass” should only be applied when the Vue data variable “isActive” is truthy

Options :

640653047985. ✓ <div :class="['activeClass', 'errorClass']"></div>

640653047986. ❌ <div :class="['activeClass', 'errorClass']"></div>

640653047987. ❌ <div :class="['activeClass', 'errorClass']"></div>

640653047988. ✓ <div :class="['activeClass', 'errorClass']"></div>

Sub-Section Number :

5

Sub-Section Id :

640653134354

Question Shuffling Allowed :

Yes

Question Number : 245 Question Id : 640653905276 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are true about Server-Sent Events (SSE)?

Options :

6406533047905. ✓ SSE connections are established using HTTP.
6406533047906. ✗ SSE supports bidirectional communication between client and server.
6406533047907. ✗ SSE automatically switches to web socket if the connection is successful.
6406533047908. ✓ SSE is suitable for sending updates to multiple clients simultaneously.

Question Number : 246 Question Id : 640653905291 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following HTTP header(s) can be used to control caching behavior in web applications?

Options :

6406533047957. ✓ Cache-Control
6406533047958. ✓ Expires
6406533047959. ✗ Bearer
6406533047960. ✗ Content-Type

Question Number : 247 Question Id : 640653905300 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statement(s) is/are true regarding long and short polling?

Options :

6406533047993. ✗ A webhook is the same as short polling.
6406533047994. ✓ The short polling can be used to know the state of an asynchronous task, and trigger an action if the task gets completed.
6406533047995. ✗ The long polling cannot be achieved using HTTP protocol.
6406533047996. ✓ Long Polling can be used to achieve real time communication.

Sub-Section Number : 6

Sub-Section Id : 640653134355

Question Shuffling Allowed : Yes

Question Number : 248 Question Id : 640653905277 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following Vue.js 2 component using CDN.

```

<div id="app">
  <input v-model="newItem" placeholder="Add an item" />
  <button @click="addItem">Add</button>

  <ul>
    <li v-for="(item, index) in items" :key="index">
      {{ index + 1 }}. {{ item }}
    </li>
  </ul>
</div>

<script src="https://cdn.jsdelivr.net/npm/vue@2"></script>
<script>
  new Vue({
    el: '#app',
    data: {
      newItem: '',
      items: ['Apple', 'Banana']
    },
    methods: {
      addItem() {
        if (this.newItem) {
          this.items.push(this.newItem, this.newItem);
          this.newItem = '';
        }
      }
    }
  );
</script>

```

After entering "Orange" in the input box and clicking the "Add" button, what will be seen in the browser?

Options :

6406533047909. ✓ 1. Apple

2. Banana

3. Orange

4. Orange

6406533047910. ✗ 1. Apple

2. Banana

3. Orange

3. Orange

6406533047911. ✗ 1. Apple

2. Banana

3. Orange

3. Orange

6406533047912. ✗ 1. Apple

2. Banana

Question Number : 249 Question Id : 640653905278 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following javascript code running on browser

```
localStorage.setItem('counter', '0');
sessionStorage.setItem('total', '5');

for (let i = 0; i < 3; i++) {
    let counter = localStorage.getItem('counter');
    let total = sessionStorage.getItem('total');

    counter += 2;
    total *= 2;

    localStorage.setItem('counter', counter);
    sessionStorage.setItem('total', total);
}

sessionStorage.clear();

console.log(localStorage.getItem('counter'));
console.log(sessionStorage.getItem('total'));
```

What will be the output in the browser console?

Options :

6406533047913. ❌ 6

40

6406533047914. ❌ null

40

6406533047915. ❌ 6

null

6406533047916. ✓ 0222

null

Question Number : 250 Question Id : 640653905283 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the below JavaScript program.

```
class Animal {
  constructor(name) {
    this.name = name;
  }

  speak() {
    console.log(` ${this.name} makes a noise.`);
  }
}

class Dog extends Animal {
  speak() {
    console.log(` ${this.name} barks`);
  }
}

const d = new Dog('Rex');
d.speak();
console.log(d.__proto__ === Dog.prototype);
console.log(d.__proto__.__proto__ === Animal.prototype);
```

What will be the output of the above program?

Options :

640653047929. ✓ Rex barks

true

true

640653047930. ✗ Rex barks

false

true

640653047931. ✗ Rex barks.

true

false

640653047932. ✗ Rex barks.

false

false

Question Number : 251 Question Id : 640653905284 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the below flask application.

```

from flask import Flask
from flask_caching import Cache
from time import sleep

config = {
    "CACHE_TYPE": "SimpleCache",
    "CACHE_DEFAULT_TIMEOUT": 180
}

app = Flask(__name__)
app.config.from_mapping(config)
cache = Cache(app)

@cache.memoize(timeout=180)
def get_data(param):
    sleep(5)
    return f"Data for {param}"

@app.route('/data/<param>')
def data(param):
    result = get_data(param)
    return f"Result: {result}"

if __name__ == '__main__':
    app.run(debug=True)

```

If the application is running on “<http://127.0.0.1:5000>” and the user visits the URL “<http://127.0.0.1:5000/data/test>” three times in the following sequence:

1. First visit
2. Second visit after 2 minutes and 30 seconds
3. Third visit after 1 minute from the second visit

What will be the approximate difference in response times between the first and third requests?

Options :

6406533047933. ✘ 5 seconds

6406533047934. ✓ 0 seconds

6406533047935. ✘ 10 seconds

6406533047936. ✘ 180 seconds

Question Number : 252 Question Id : 640653905285 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the below JavaScript program.

```

new Promise((resolve, reject) => {
  const num = 0.6;
  if (num > 0.5) {
    resolve(num);
  } else {
    reject(num);
  }
})
.then(data => {
  console.log("Step 1:", data);
  if (data > 0.75) {
    return data * 2;
  } else {
    return Promise.reject(new Error("Less than 0.75"));
  }
})
.then(data => {
  console.log("Step 2:", data);
  return data + 5;
})
.catch(error => {
  console.log("Step 3:", error.message);
  if (error.message === "Less than 0.75") {
    return 1;
  } else {
    throw error;
  }
})
.then(data => {
  console.log("Step 4:", data);
  if (data === 1) {
    throw new Error("Fallback value");
  } else {
    return data * 3;
  }
})
.catch(error => {
  console.log("Step 5:", error.message);
  return "Error handled";
})
.finally(() => {
  console.log("Step 6: Finally block executed");
})

```

What will be the output of the above program?

Options :

6406533047937. ❌ Step 1: 0.6

Step 2: 1.2

Step 4: 6.2

Step 6: Finally block executed

6406533047938. ✓ Step 1: 0.6

Step 3: Less than 0.75

Step 4: 1

Step 5: Fallback value

Step 6: Finally block executed

6406533047939. ❌ Step 1: 0.6

Step 2: 1.2

Step 3: Error

Step 4: 1

Step 5: Fallback value

Step 6: Finally block executed

6406533047940. ❌ Step 1: 0.6

Step 3: Less than 0.75

Step 4: 1

Step 6: Finally block executed

Question Number : 253 Question Id : 640653905286 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

In a Vue CLI project with Vuex, you have the following configuration:

src/store/index.js:

```
import Vue from 'vue';
import Vuex from 'vuex';

Vue.use(Vuex);

export default new Vuex.Store({
  state: {
    value: " ",
  },
  mutations: {
    setValue(state, payload) {
      state.value = payload;
    }
  },
  actions: {
    async fetchValue({ commit }) {
      // Simulate async API call
      const response = await new Promise(resolve => setTimeout(() =>
        resolve('API Value'), 500));
      commit('setValue', response);
    }
  }
});
```

src/App.vue:

```
<template>
  <div>
    <p>{{ value }}</p>
    <button @click="updateValue">Update Value</button>
  </div>
</template>

<script>
export default {
  computed: {
    value() {
      return this.$store.state.value;
    }
  },
  methods: {
    async updateValue() {
      await this.$store.dispatch('fetchValue');
    }
}
</script>
```

After running “npm run serve”, if you click the "Update Value" button, what will be displayed in the <p> tag?

Options :

6406533047941. ✓ API Value

6406533047942. ✗ ""

6406533047943. ✗ undefined

6406533047944. ✗ null

Question Number : 254 Question Id : 640653905287 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the below JavaScript code.

```
async function newFetch(url) {
  try {
    console.log(url)
    const res = await fetch(url)
    if (!res.ok) {
      throw new Error(`HTTP Error: ${res.status}`)
    }
    try {
      const data = await res.json()
      console.log(data)
    } catch {
      throw new Error('Error')
    }
  } catch {
    throw new Error('Data is not JSON serializable')
  }
}
newFetch('https://example.com/api/users/23').catch((err) => {
  console.error(err)
})
```

Suppose the API URL “<https://example.com/api/users/23>” returns a valid HTML output. What will be logged on to console?

Options :

- 640653047945. ❌ “Network Error”
- 640653047946. ❌ “HTTP Error: 404”
- 640653047947. ✓ “Data is not JSON serializable”
- 640653047948. ❌ Data returned by the API

Question Number : 255 Question Id : 640653905294 Question Type : MCQ Calculator : Yes

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following Flask application with Redis caching. Redis is running normally on port 6379.

```
from flask import Flask, jsonify
from flask_caching import Cache

app = Flask(__name__)
app.config['CACHE_TYPE'] = 'redis'
app.config['CACHE_REDIS_HOST'] = 'localhost'
app.config['CACHE_REDIS_PORT'] = 6379
cache = Cache(app)

def compute_value(x, y):
    result = x * y
    return result

@app.route('/compute/<int:x>/<int:y>')
@cache.cached(timeout=60, key_prefix='compute')
def compute(x,y):
    result = compute_value(x, y)
    return jsonify({'result': result})

if __name__ == '__main__':
    app.run(debug=True, port=5000)
```

Two requests are given to localhost:5000/compute/10/20 and localhost:5000/compute/5/10 within 60 seconds. What would be the json response from the server respectively?

Options :

- 640653047969. ❌ {"result": 200} and {"result": 50}
- 640653047970. ❌ {"result": 50} and {"result": 200}
- 640653047971. ❌ {"result": 100} and {"result": 100}
- 640653047972. ✓ {"result": 200} and {"result": 200}

Sub-Section Number :

7

Sub-Section Id :

640653134356

Question Shuffling Allowed :

No

Question Id : 640653905279 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (256 to 257)

Question Label : Comprehension

Consider the following flask/python code snippets and answer the given subquestions

Note : The `yield` keyword makes a function return one value at a time, saving its place so it can continue from where it left off.

`requests.get()` makes a http GET request to a given url, like `fetch` in JavaScript.

Options:

A.

```
import requests

response = requests.get('https://some-api')
print(response.json())
```

B.

```
from flask import Flask, request

app = Flask(__name__)

@app.route('/server-route', methods=['POST'])
def server_route():
    data = request.json
    print(data)
    return 'OK', 200
```

C.

```
from flask import Flask, Response
import time

app = Flask(__name__)

def stream():
    while True:
        time.sleep(5)
        yield f'data: The time is {time.strftime("%Y-%m-%d %H:%M:%S")}\n\n'

@app.route('/server-route')
def server_route():
    return Response(stream(), mimetype='text/event-stream')

if __name__ == '__main__':
    app.run(debug=True, port=5000)
```

D.

```
import time
import requests

while True:
    response = requests.get('https://some-endpoint')
    print(response.json())
    time.sleep(10)
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 256 Question Id : 640653905280 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Which code snippet represents a **Webhook receiver** implementation?

Options :

640653047917. ✘ A

640653047918. ✓ B

640653047919. ✘ C

640653047920. ✘ D

Question Number : 257 Question Id : 640653905281 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Which code snippet represents a **Pub/Sub** implementation?

Options :

6406533047921. ✘ A

6406533047922. ✘ B

6406533047923. ✓ C

6406533047924. ✘ D

Question Id : 640653905288 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (258 to 259)

Question Label : Comprehension

Consider the following HTML document and the script file shown below. Assuming the CDNs for Vue2 and VueRouter are correctly configured, answer the given subquestions

Filename: index.html

```
<div id="app">
    <router-view></router-view>
</div>
<script src="script.js"></script>
```

Filename: script.js

```
const Error = {template: `<div>Page Not Found</div>`}
const Profile = {
  template: `<div>
    <div v-if='user'>
      Name: {{user.name}}, State: {{user.state}}
    </div>
    <div v-else>
      Unknown User
    </div>
  </div>`,
  data() {
    return {
      profiles: [
        { id: '1234', name: 'Animesh', state: 'MP' },
        { id: '1235', name: 'Arnav', state: 'Goa' },
      ],
    }
  },
  computed: {
    user(){
      let user = this.profiles.find((profile) => {
        return profile.id == this.$route.params.id
      })
      return user
    },
  },
}
```

```

computed: {
  user(){
    let user = this.profiles.find((profile) => {
      return profile.id == this.$route.params.id
    })
    return user
  },
},
}

const routes = [
  { path: '/profile/:id', component: Profile },
  { path: '*', component: Error },
]

const router = new VueRouter({
  routes,
})

new Vue({
  el: '#app',
  router,
})

```

Sub questions

Question Number : 258 Question Id : 640653905289 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Suppose the application is running on port 8080.

What will be rendered inside router-view for the URL

[“<http://127.0.0.1:8080/#/profile/1235>”?](http://127.0.0.1:8080/#/profile/1235)

Options :

640653047949. ❌ Page Not Found

640653047950. ❌ Unknown User

640653047951. ❌ Name: Animesh, State: MP

640653047952. ✓ Name: Arnav, State: Goa

Question Number : 259 Question Id : 640653905290 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Suppose the application is running on port 8080. What will be rendered inside router-view for the URL

"<http://127.0.0.1:8080/#/profile/Arnav>"?

Options :

- 6406533047953. ✘ Page Not Found
- 6406533047954. ✘ Name: Animesh, State: MP
- 6406533047955. ✘ Name: Arnav, State: Goa
- 6406533047956. ✓ Unknown User

MLT

Section Id :	64065364170
Section Number :	12
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	18
Number of Questions to be attempted :	18
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134357
Question Shuffling Allowed :	No

Question Number : 260 Question Id : 640653905301 Question Type : MCQ Calculator : Yes

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 :

640653047997. ✓ YES

640653047998. ✗ NO

Sub-Section Number :

2

Sub-Section Id :

640653134358

Question Shuffling Allowed :

Yes

Question Number : 261 Question Id : 640653905302 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

The eigenvalues of the covariance matrix of a centered dataset in \mathbb{R}^5 are 15, 5, 5, 0, 0. Standard PCA is performed on this dataset. What is the variance captured by the top two principal components expressed as a percentage of total variance?

Options :

640653047999. ✓ 80%

640653048000. ✗ 60%

640653048001. ✗ 20%

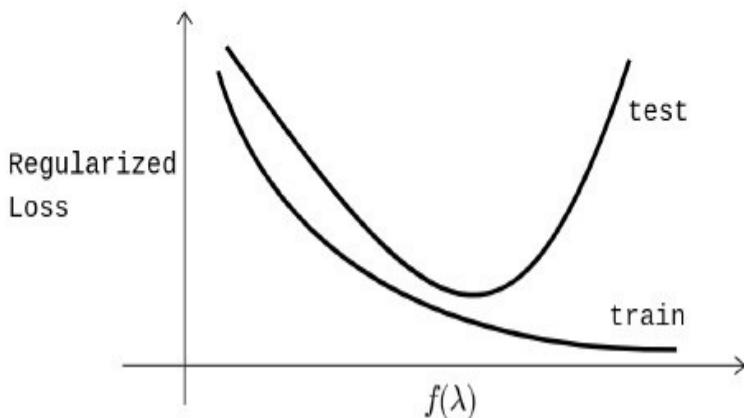
640653048002. ✗ 15%

Question Number : 262 Question Id : 640653905303 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider a regression problem that has a training and test dataset. Ridge regression is applied on the problem for various values of λ . The training and test loss are plotted against some function of λ , which we call $f(\lambda)$. Note that the continuous curves are obtained by connecting the points using a smooth curve. What is the most appropriate choice of $f(\lambda)$? Recall that the regularized loss is the sum of the SSE and the regularization term. Note that SSE is the sum of squared errors.



Options :

1

640653048003. ✓ $\frac{1}{\lambda}$

640653048004. ✗ λ

6406533048005. ✘ λ^2

6406533048006. ✘ $\log(\lambda)$

Question Number : 263 Question Id : 640653905304 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Match the characteristics given below with the appropriate ensemble technique.

1. Decision stumps
2. Deep decision trees
3. Parallel execution
4. Sequential execution

Options :

6406533048007. ✓ Bagging → (2), (3); Boosting → (1), (4)

6406533048008. ✘ Bagging → (1), (4); Boosting → (2), (3)

6406533048009. ✘ Bagging → (1), (3); Boosting → (2), (4)

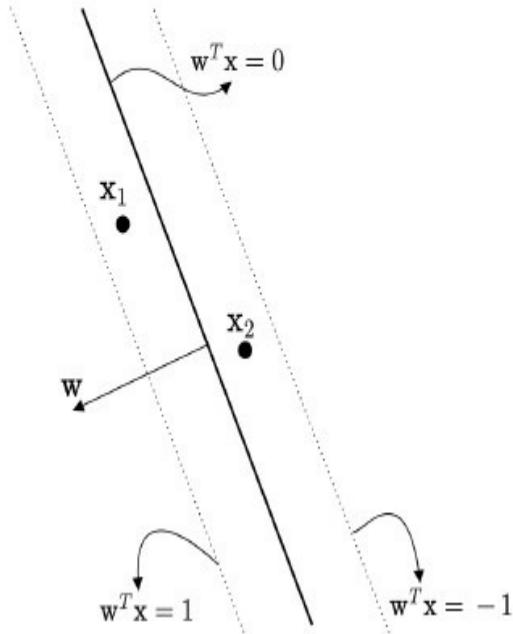
6406533048010. ✘ Bagging → (2), (4); Boosting → (1), (3)

Question Number : 264 Question Id : 640653905305 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider a hard-margin SVM that has been trained on a linearly separable dataset with positive margin. Two test data-points are given below along with the decision boundary and the supporting hyperplanes. Which of the following is true?



Options :

6406533048011. ✓ The predicted labels for x_1 and x_2 are 1 and -1 respectively.
 6406533048012. ✗ The predicted labels for x_1 and x_2 are -1 and 1 respectively.
 6406533048013. ✗ The predicted label for both data-points is 1.
 6406533048014. ✗ The predicted label for both data-points is -1.

Question Number : 265 Question Id : 640653905306 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

For a dataset with features in \mathbb{R}^3 , which of the following expresses the class conditional independence assumption in a Naive Bayes model? $p(\cdot)$ denotes probability.

Options :

6406533048015. ✓ $p((x_1, x_2, x_3) | y) = p(x_1 | y) \cdot p(x_2 | y) \cdot p(x_3 | y)$
 6406533048016. ✗ $p((x_1, x_2, x_3), y) = p(y) \cdot p(x_1) \cdot p(x_2) \cdot p(x_3)$

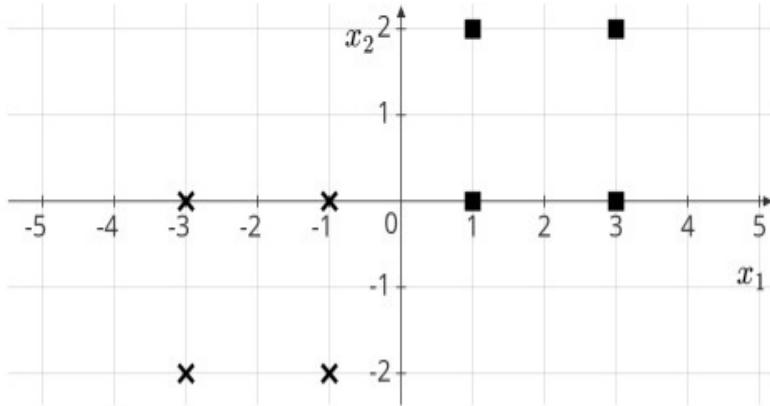
$$6406533048017. ✗ p((x_1, x_2, x_3) | y) = \frac{p((x_1, x_2, x_3), y)}{p(y)}$$

$$6406533048018. ✗ p(y | (x_1, x_2, x_3)) = \frac{p((x_1, x_2, x_3), y)}{p(x_1, x_2, x_3)}$$

Question Number : 266 Question Id : 640653905307 Question Type : MCQ Calculator : Yes

Correct Marks : 3**Question Label : Multiple Choice Question**

The result of k-means clustering on a dataset of eight points is displayed below. Four points belong to the cluster denoted by the ■ symbol and the rest belong to the cluster denoted by the ✕ symbol. The cluster boundary is a line such that all points on it could belong to either of the two clusters. Which of the following is the equation of the cluster boundary?

**Options :**6406533048019. ✓ $2x_1 + x_2 = 0$ 6406533048020. ✗ $x_1 - 2x_2 = 0$ 6406533048021. ✗ $x_1 + x_2 = 0$ 6406533048022. ✗ $x_1 + 2x_2 = 0$ **Sub-Section Number :**

3

Sub-Section Id :

640653134359

Question Shuffling Allowed :

Yes

Question Number : 267 Question Id : 640653905312 Question Type : SA Calculator : None**Correct Marks : 3****Question Label : Short Answer Question**

A hard-margin SVM is trained on a linearly separable dataset with a positive margin. The features are in \mathbb{R}^2 . The optimal weight vector is $\begin{bmatrix} 3 \\ 4 \end{bmatrix}$. Find the distance between the two supporting hyperplanes.

Response Type : Numeric**Evaluation Required For SA : Yes****Show Word Count : Yes****Answers Type : Equal****Text Areas : PlainText****Possible Answers :**

0.4

Question Number : 268 Question Id : 640653905313 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Consider a dataset for an unsupervised learning problem in which each data-point is either 1 or 0. This dataset is modeled using a Bernoulli distribution with parameter p . The MLE for p is 0.25. If the number of ones in the dataset is 10, find the number of zeros.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

30

Question Number : 269 Question Id : 640653905314 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Consider a decision stump (parent with two children). The parent node has 200 data-points out of which 50 belong to the positive class. The left child has 100 data-points out of which 50 belong to the positive class. Find the information gain. Use \log_2 . Enter your answer correct to three decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.26 to 0.37

Sub-Section Number :	4
Sub-Section Id :	640653134360
Question Shuffling Allowed :	Yes

Question Number : 270 Question Id : 640653905309 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider $k : \mathbb{R}^d \times \mathbb{R}^d \rightarrow \mathbb{R}$, a polynomial kernel of degree p . If the kernel always outputs a non-negative value, which of the following are possible values for p ?

Options :

6406533048027. ✓ 2

6406533048028. ✓ 4

6406533048029. ✗ 3

6406533048030. ✗ 5

Question Number : 271 Question Id : 640653905310 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider a training dataset of 100 points for a binary classification problem with the following structure.

- The features are in \mathbb{R}^2 and the labels are in $\{-1, 1\}$
- For every data-point $((x_1, x_2), y)$ in the training dataset, $x_1 x_2 > 0$ and $x_1 y > 0$.

Which of the following statements are true?

Options :

6406533048031. ✓ The dataset is linearly separable with a positive margin.

6406533048032. ✓ The perceptron algorithm will terminate after a finite number of iterations when trained on this dataset.

6406533048033. ✗ The dataset is linearly separable, but the margin may be zero.

6406533048034. ✗ The dataset is not linearly separable.

Question Number : 272 Question Id : 640653905311 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider a logistic regression model trained for a binary classification problem

with features in \mathbb{R}^2 and labels in $\{1, 0\}$. The probability that the test point $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$ belongs

to class 1 is equal to $\frac{1}{1 + e^2}$. Which of the following could be the weight vector of the logistic regression classifier? Select all possible answers.

Options :

6406533048035. ✓ $\begin{bmatrix} -1 \\ -1 \end{bmatrix}$

6406533048036. ✓ $\begin{bmatrix} 1 \\ -3 \end{bmatrix}$

6406533048037. ✘ $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$

6406533048038. ✘ $\begin{bmatrix} 3 \\ -1 \end{bmatrix}$

Sub-Section Number :

5

Sub-Section Id :

640653134361

Question Shuffling Allowed :

No

Question Id : 640653905315 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (273 to 275)

Question Label : Comprehension

Consider a linearly separable dataset with a positive margin. The symbol α_i^* in the context of SVMs has its usual meaning. Are the following statements true or false?

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 273 Question Id : 640653905316 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

The weight vector output by the perceptron algorithm on this dataset can be expressed as a linear combination of the data-points where the coefficients of the linear combination are integers.

Options :

6406533048042. ✓ TRUE

6406533048043. ✘ FALSE

Question Number : 274 Question Id : 640653905317 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

In the case of a hard-margin SVM,

if $\alpha_i^* \geq 0$, the point x_i is a support vector.

Options :

6406533048044. ✘ TRUE

Question Number : 275 Question Id : 640653905318 Question Type : MCQ Calculator : Yes**Correct Marks : 1**

Question Label : Multiple Choice Question

If a soft-margin SVM is trained on this dataset, the optimal weight vector it returns will be the same as the one returned by a hard-margin SVM, irrespective of the value of the hyperparameter C .

Options :

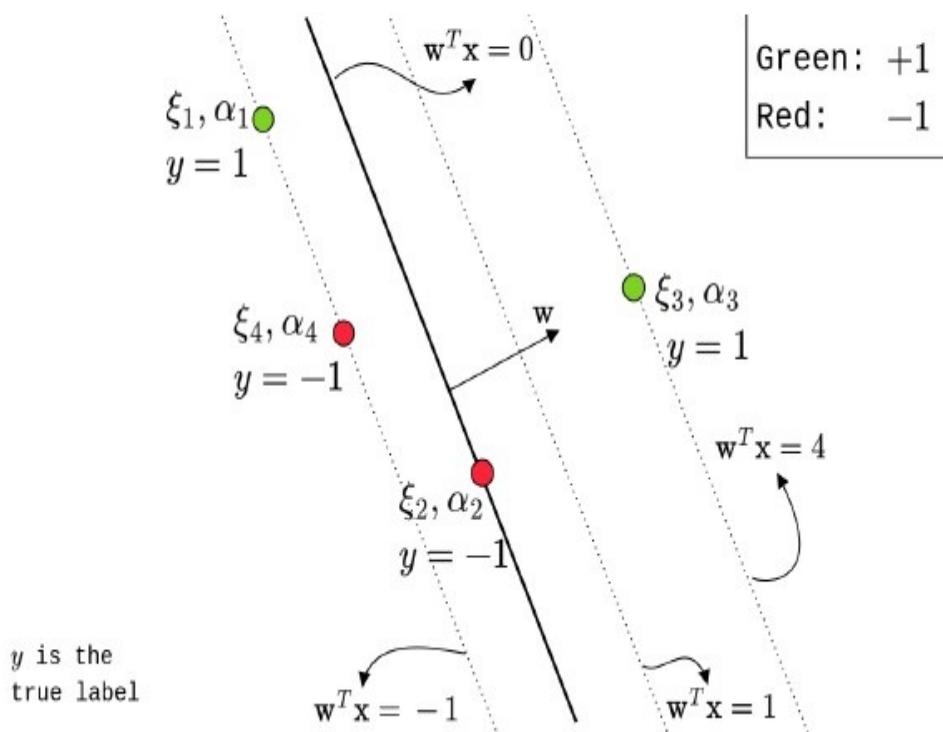
640653048046. ✘ TRUE

640653048047. ✓ FALSE

Question Id : 640653905319 Question Type : COMPREHENSION Sub Question Shuffling**Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix****Calculator : None****Question Numbers : (276 to 281)**

Question Label : Comprehension

Consider a soft-margin SVM with $C = 3$ that has been trained on a dataset with features in \mathbb{R}^2 . The decision boundary and the supporting hyperplanes are displayed below. Four points from the training dataset are also displayed. Green data-points belong to class 1 and red data-points belong to class -1. Symbols ξ and α have their usual meanings. Assume that w, ξ_i, α_i represent the optimal values.



Based on the above data, answer the given subquestions.

Sub questions**Question Number : 276 Question Id : 640653905320 Question Type : SA Calculator : None**

Correct Marks : 0.5

Question Label : Short Answer Question

What is ξ_1 ? _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 277 Question Id : 640653905321 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

What is ξ_2 ? _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 278 Question Id : 640653905322 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

What is ξ_3 ? _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 279 Question Id : 640653905323 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

What is α_1 ? If it cannot be determined exactly, enter -1. _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 280 Question Id : 640653905324 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

What is α_3 ? If it cannot be determined exactly, enter -1. _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 281 Question Id : 640653905325 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

What is α_4 ? If it cannot be determined exactly, enter -1. _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

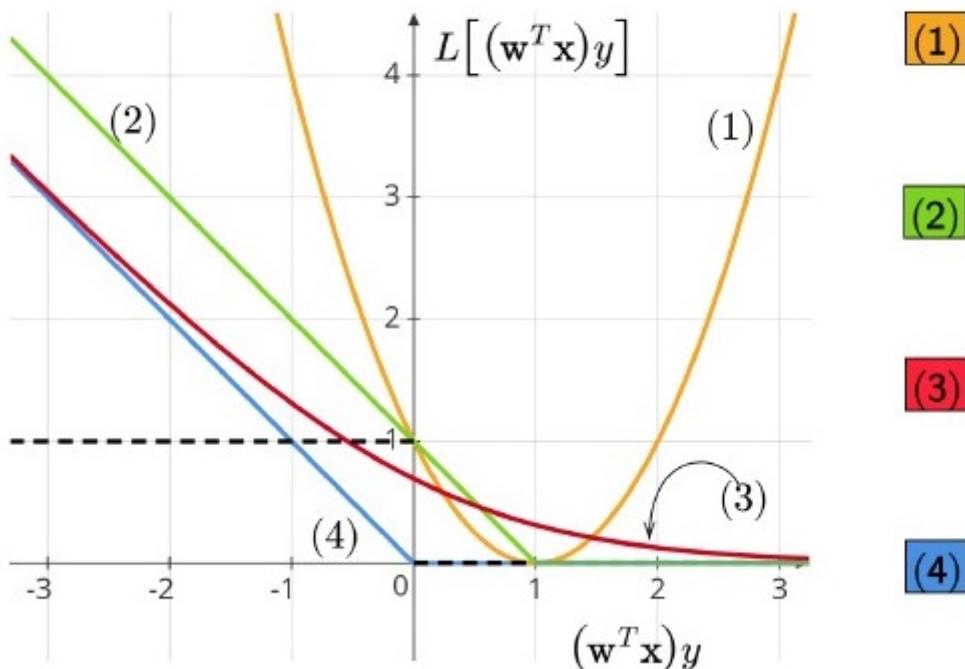
-1

Question Id : 640653905326 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (282 to 286)

Question Label : Comprehension

The convex surrogates for the 0-1 loss are displayed below:



Based on the above data, answer the given subquestions.

Sub questions**Question Number : 282 Question Id : 640653905327 Question Type : SA Calculator : None****Correct Marks : 0.5**

Question Label : Short Answer Question

Enter the number corresponding
to the logistic loss. _____**Response Type : Numeric****Evaluation Required For SA : Yes****Show Word Count : Yes****Answers Type : Equal****Text Areas : PlainText****Possible Answers :**

3

Question Number : 283 Question Id : 640653905328 Question Type : SA Calculator : None**Correct Marks : 0.5**

Question Label : Short Answer Question

Enter the number corresponding to the
(SVM) hinge loss. _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 284 **Question Id :** 640653905329 **Question Type :** SA **Calculator :** None

Correct Marks : 0.5

Question Label : Short Answer Question

Enter the number corresponding to
the perceptron loss. _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 285 **Question Id :** 640653905330 **Question Type :** SA **Calculator :** None

Correct Marks : 0.5

Question Label : Short Answer Question

Enter the number corresponding to the squared loss. _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 286 **Question Id :** 640653905331 **Question Type :** MCQ **Calculator :** Yes

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following statements is true? $\ln = \log_e$.

Options :

6406533048058. ✓

The logistic loss and the (SVM) hinge loss intersect when $(\mathbf{w}^T \mathbf{x})y = \ln(e - 1)$.

The logistic loss and the (SVM) hinge loss do not intersect.
6406533048059. ❌

The logistic loss and the (SVM) hinge loss intersect when $(\mathbf{w}^T \mathbf{x})y = \ln(1 - \frac{1}{e})$.
6406533048060. ❌

The logistic loss and the (SVM) hinge loss intersect when $(\mathbf{w}^T \mathbf{x})y = \frac{1}{e}$.
6406533048061. ❌

Question Id : 640653905332 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (287 to 289)

Question Label : Comprehension

Consider the following architecture of a neural network for a binary classification problem:

Layer type	Number of neurons
Input	5
Hidden layer-1	10
Hidden layer-2	10
Output	1

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 287 Question Id : 640653905333 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

How many learnable parameters does this network have? Ignore the biases in the computation.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

160

Question Number : 288 Question Id : 640653905334 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

What is the most appropriate choice of activation function for the output layer if the binary cross-entropy loss is used?

Options :

6406533048063. ✓ Sigmoid

6406533048064. ✗ Linear

6406533048065. ✗ ReLU

Question Number : 289 Question Id : 640653905335 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

For a particular data-point, the activations after the first hidden layer in the forward pass is given to be

$[0.2 \ 0.1 \ 1.5 \ 0.3 \ 0.1 \ 0 \ 0.8 \ 1.2 \ 1 \ 0]^T$.

What is the activation function used in the first hidden layer?

Options :

6406533048066. ✓ ReLU

6406533048067. ✗ Sigmoid

Sub-Section Number :

6

Sub-Section Id :

640653134362

Question Shuffling Allowed :

Yes

Question Number : 290 Question Id : 640653905308 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Consider a linear regression problem. Which of the following is the gradient of the SSE function with respect to $w \in \mathbb{R}^d$, the weight vector, for a single data-point $x \in \mathbb{R}^d$? y is the true label and \hat{y} is the predicted label. Note that SSE is the sum of squared errors.

Options :

6406533048023. ✓ $(\hat{y} - y)x$

6406533048024. ✗ $(w^T x)w$

6406533048025. ✗ $\hat{y}x$

6406533048026. ✗ xy

MLP

Section Id :	64065364171
Section Number :	13
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	33
Number of Questions to be attempted :	33
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 :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134363
Question Shuffling Allowed :	No

Question Number : 291 Question Id : 640653905336 Question Type : MCQ Calculator : Yes

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 :

640653048068. ✓ YES

640653048069. ✘ NO

Sub-Section Number :

2

Sub-Section Id :

640653134364

Question Shuffling Allowed :

No

Question Id : 640653905337 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (292 to 296)

Question Label : Comprehension

Consider following common data and answer the subquestions:

```
import pandas as pd
import numpy as np
columns = ["Glucose", "BloodPressure", "Insulin",
           "BMI", "Age"]
data = [[148, 72, 0, 33.6, 50],
        [85, 66, 0, 26.6, np.nan],
        [183, 64, 0, 23.3, 32],
        [89, 66, 94, 28.1, 21],
        [137, 40, 168, 43.1, 33]]
df = pd.DataFrame(data=data, columns=columns)
```

Sub questions

Question Number : 292 Question Id : 640653905338 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

What will be the output of the following code snippet?

```
print(df.shape[0]*df.shape[1] - df.isna().sum().sum())
```

Enter -1, if you think the above code snippet will generate an error.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

24

Question Number : 293 Question Id : 640653905339 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

What will be the output of the following code snippet?

```
t = df.Insulin.value_counts()  
print(t.loc[0])
```

Enter -1, if you think the above code snippet will generate an error.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 294 Question Id : 640653905340 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

What will be the output of the following code snippet?

```
t= df.iloc[:,4]  
print(t.mean())
```

Enter -1, if you think the above code snippet will generate an error.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

34

Question Number : 295 Question Id : 640653905341 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

How many columns have datatype as "float64"?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 296 **Question Id :** 640653905342 **Question Type :** SA **Calculator :** None

Correct Marks : 2

Question Label : Short Answer Question

What will be the output of the following code snippet?

```
t=(df
    .query("Glucose > 100")
    .head(2)
    .tail(1)
    .iloc[0,1])
print(t)
```

Enter -1, if you think the above code snippet will generate an error.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

64

Sub-Section Number :

3

Sub-Section Id :

640653134365

Question Shuffling Allowed :

Yes

Question Number : 297 **Question Id :** 640653905343 **Question Type :** SA **Calculator :** None

Correct Marks : 2

Question Label : Short Answer Question

Consider following parameter grid for regression with RandomForest:

```
parameter_grid = [
    {'n_estimators':[10,20,30],
     'max_features': [2,3,4,5,6]},
    { 'bootstrap':[True, False],
      'min_samples_leaf':[1,2,3]}]
```

How many unique combinations of hyperparameters are there in the above parameter grid?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

21

Sub-Section Number : 4

Sub-Section Id : 640653134366

Question Shuffling Allowed : Yes

Question Number : 298 **Question Id :** 640653905350 **Question Type :** MCQ **Calculator :** Yes

Correct Marks : 1

Question Label : Multiple Choice Question

How to make SGDRegressor stop after 1000 epochs?

Options :

6406533048101. ✘ `from sklearn.linear_model import SGDRegressor
linear_regressor = SGDRegressor(max_epoch=1000)`

6406533048102. ✘ `from sklearn.linear_model import SGDRegressor
linear_regressor = SGDRegressor(stopping_criteria=1000)`

6406533048103. ✓ `from sklearn.linear_model import SGDRegressor
linear_regressor = SGDRegressor(max_iter=1000)`

6406533048104. ✘ `from sklearn.linear_model import SGDRegressor
linear_regressor = SGDRegressor(stop_after_iter=1000)`

Sub-Section Number : 5

Sub-Section Id : 640653134367

Question Shuffling Allowed : Yes

Question Number : 299 **Question Id :** 640653905346 **Question Type :** MCQ **Calculator :** Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Consider following data:

```
data = [{'age': 4, 'height':96.0},  
        {'age': 1, 'height':73.9},  
        {'age': 3, 'height':88.9},  
        {'age': 2, 'height':81.6}]
```

Which one of the following APIs can be used to extract features from the above data?

Options :

6406533048086. ✓ DictVectorizer

6406533048087. ✗ HashingVectorizer

6406533048088. ✗ FeatureHasher

Question Number : 300 Question Id : 640653905347 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following is an example of an ordinal variable?

Options :

6406533048089. ✗ Blood type (A, B, AB, O)

6406533048090. ✓ Satisfaction rating (Very Unsatisfied, Unsatisfied, Neutral, Satisfied, Very Satisfied)

6406533048091. ✗ Height of individuals

6406533048092. ✗ Gender

Question Number : 301 Question Id : 640653905355 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following method is used to find the predicted probability of each class of training samples using a trained model = SGDClassifier() ?

Options :

6406533048118. ✓ model.predict_proba(X_train)

6406533048119. ✗ model.predict(X_train)

6406533048120. ✗ model.estimate_

6406533048121. ✗ model.predict_proba_

Question Number : 302 Question Id : 640653905360 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Consider following code snippet:

```
estimator = RidgeClassifier(normalize=False, _____=0)
pipe_ridge = make_pipeline(MinMaxScaler(),estimator)
pipe_ridge.fit(x,y)
```

If we want to apply the ridge classifier on X with no regularization, what will be the missing attribute.

Options :

6406533048125. ✘ cv

6406533048126. ✘ reg_rate

6406533048127. ✓ alpha

6406533048128. ✘ tol

Sub-Section Number :

6

Sub-Section Id :

640653134368

Question Shuffling Allowed :

Yes

Question Number : 303 Question Id : 640653905349 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

For a dataset with 1000 data points and 100 features, the following code will generate how many models during execution?

Note: X is the feature matrix and y is the target vector.

```
from sklearn.model_selection import cross_val_score
from sklearn.model_selection import LeaveOneOut
from sklearn.linear_model import linear_regression
lin_reg = linear_regression()
loocv = LeaveOneOut()
score = cross_val_score(lin_reg, X, y, cv=loocv)
```

Options :

6406533048097. ✓ 1000

6406533048098. ✘ 100

6406533048099. ✘ 99

6406533048100. ✘ 999

Question Number : 304 Question Id : 640653905351 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following code snippets correctly applies Lasso regression with a regularization strength of 0.1 on scaled dataset?

```
from sklearn.linear_model import Lasso
from sklearn.preprocessing import StandardScaler
from sklearn.pipeline import make_pipeline

lasso = make_pipeline(StandardScaler(), ?)
lasso.fit(X_train, y_train)
```

Options :

6406533048105. ✘ Lasso(alpha=0.5)

6406533048106. ✓ Lasso(alpha=0.1)

6406533048107. ✘ Lasso(alpha=0.01, max_iter=500)

6406533048108. ✘ Lasso(alpha=1.0, tol=0.01)

Question Number : 305 Question Id : 640653905352 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following polynomial regression model. What is the effect of the include_bias parameter?

```
from sklearn.preprocessing import PolynomialFeatures
poly = PolynomialFeatures(degree=2, include_bias=False)
X_poly = poly.fit_transform(X)
```

Options :

6406533048109. ✓ It determines whether to include a bias term in the model.

6406533048110. ✘ It sets the degree of the polynomial features.

6406533048111. ✘ It controls the regularization strength.

6406533048112. ✘ It specifies the number of features to consider when fitting the model.

Question Number : 306 Question Id : 640653905365 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following code snippet for training a decision tree classifier.
What is the purpose of the `max_depth` parameter?

```
from sklearn.tree import DecisionTreeClassifier  
clf = DecisionTreeClassifier(max_depth=3, random_state=0)  
clf.fit(X_train, y_train)
```

Options :

- 6406533048142. ✘ To specify the maximum number of samples per leaf.
- 6406533048143. ✓ To limit the depth of the tree.
- 6406533048144. ✘ To set the minimum number of samples required to split an internal node.
- 6406533048145. ✘ To control the minimum impurity decrease required for a split.

Question Number : 307 Question Id : 640653905366 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Given the code below, which of the following statements is true about the `criterion` parameter?

```
from sklearn.tree import DecisionTreeRegressor  
reg = DecisionTreeRegressor(criterion='mse', random_state=42)  
reg.fit(X_train, y_train)
```

Options :

- 6406533048146. ✓ It determines the function to measure the quality of a split.
- 6406533048147. ✘ It specifies the number of features to consider when looking for the best split.
- 6406533048148. ✘ It sets the strategy used to choose the split at each node.
- 6406533048149. ✘ It controls whether to use the Gini impurity or entropy.

Question Number : 308 Question Id : 640653905368 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following code snippets correctly initializes a `RandomForestClassifier` with 100 trees and bootstrapping enabled?

```
from sklearn.ensemble import RandomForestClassifier  
clf = ?
```

Options :

- 6406533048155. ✘ `RandomForestClassifier(n_estimators=100,bootstrap=False)`
- 6406533048156. ✘ `RandomForestClassifier(n_features=100, bootstrap=False)`

6406533048157. ❌ RandomForestClassifier(estimators_number=100, bootstrap=True)

6406533048158. ✓ RandomForestClassifier(n_estimators=100, bootstrap=True)

Question Number : 309 Question Id : 640653905369 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider below statements and choose the correct option:

Statement1:The bagging technique combines multiple models trained on different subsets of data

Statement2:The Boosting technique trains the model Parallelly, focusing on the error made by the other model.

Options :

6406533048159. ❌ Statement1 is True, Statement2 is True

6406533048160. ✓ Statement1 is True, Statement2 is False

6406533048161. ❌ Statement1 is False, Statement2 is True

6406533048162. ❌ Statement1 is False, Statement2 is False

Question Number : 310 Question Id : 640653905372 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

How does agglomerative clustering handle outliers?

Options :

6406533048171. ❌ It ignores outliers during the clustering process.

6406533048172. ✓ It assigns outliers to the nearest cluster.

6406533048173. ❌ It creates separate clusters for outliers.

6406533048174. ❌ It removes outliers from the dataset before clustering.

Question Number : 311 Question Id : 640653905373 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

What is agglomerative clustering?

Options :

6406533048175. ✓ A hierarchical clustering technique that starts with each data point as its cluster and merges the closest clusters iteratively.

6406533048176. ❌ A method for partitioning data into a predefined number of clusters.

6406533048177. ❌ A clustering algorithm that uses centroids to iteratively assign data points to clusters.

6406533048178. ❌ A dimensionality reduction technique that projects data onto a lower-

dimensional space.

Question Number : 312 Question Id : 640653905374 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

In K-Means clustering, what does the `inertia_` attribute represent?

Options :

6406533048179. ❌ The distance between cluster centroids

6406533048180. ❌ The number of clusters formed

6406533048181. ✓ The within-cluster sum of squared distances

6406533048182. ❌ The silhouette coefficient

Sub-Section Number :

7

Sub-Section Id :

640653134369

Question Shuffling Allowed :

Yes

Question Number : 313 Question Id : 640653905345 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following ML task/steps for a regression dataset:

1. Read the data from a file (named 'dataset.csv'). It has 7 columns. The last column is the target variable, all 6 features numerical.
2. Remove rows which has target values missing.
3. Split the data into training and test sets. Take randomly the 70% of rows in the training set and the rest of them into the test set.
4. Fill the missing values in the features by KNNImputer using 3 nearest neighbours.
5. Train a **LinearRegression** model on the training set.
6. Report R2 score on the test set.

Which of the following code snippets correctly accomplishes the above task? Assume necessary imports.

Options :

```
data = pd.read_csv('dataset.csv')
X, y = data[data.columns[:-1]], data[data.columns[-1]]
X = X[y.notna()]
y = y.dropna()
X_train, X_test, y_train, y_test = train_test_split(X,y,
                                                    train_size=0.7)
pipe = Pipeline([('imputer', KNNImputer(n_neighbors = 3)),
                 ('estimator', LinearRegression())])

pipe.fit(X_train,y_train)
print(pipe.score(X_test, y_test))
```

6406533048080. ✓

```
data = pd.read_csv('dataset.csv')
data.dropna(inplace=True)
X, y = data[data.columns[:-1]], data[data.columns[-1]]
X = X[y.notna()]
y = y.dropna()
X_train, X_test, y_train, y_test = train_test_split(X,y,
                                                    train_size=0.7)
pipe = Pipeline([('imputer', KNNImputer(n_neighbors = 3)),
                 ('estimator', LinearRegression())])

pipe.fit(X_train,y_train)
print(pipe.score(X_test, y_test))
```

6406533048081. ✘

```
data = pd.read_csv('dataset.csv')
X, y = data[data.columns[:-1]], data[data.columns[-1]]
X_train, X_test, y_train, y_test = train_test_split(X,y,
                                                    train_size=0.8)
pipe = Pipeline([('imputer', KNNImputer(n_neighbors = 3)),
                 ('estimator', LinearRegression())])

pipe.fit(X_train,y_train)
print(pipe.score(y_test, y_test))
```

6406533048082. ✘

```
data = pd.read_csv('dataset.csv')
X, y = data[data.columns[:-1]], data[data.columns[-1]]
X = X[y.notna()]
y = y.dropna()
X_train, X_test, y_train, y_test = train_test_split(X,y,
                                                    train_size=0.7)
pipe = Pipeline([('imputer', KNNImputer(n_neighbors = 5)),
                 ('estimator', LinearRegression())])

pipe.fit(X_train,y_train)
print(pipe.score(X_test, y_test))
```

6406533048083. ✘

```
data = pd.read_csv('dataset.csv')
data = data.dropna()
X, y = data[data.columns[:-1]], data[data.columns[-1]]

X_train, X_test, y_train, y_test = train_test_split(X,y,
                                                    test_size=0.2)
pipe = Pipeline([('imputer', KNNImputer(n_neighbors = 3)),
                 ('estimator', LinearRegression())])
pipe.fit(X_train,y_train)
print(pipe.score(X_test, X_test))
```

6406533048084. ✘

6406533048085. ✘ None of these

Question Number : 314 Question Id : 640653905364 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider two classifiers as shown in the following block of code:

```
from sklearn.datasets import load_wine
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split
X,y = load_wine(as_frame = True,
                  return_X_y = True)
X_train,X_test,y_train,y_test = train_test_split(X, y,
                                                test_size = 0.2,
                                                random_state = 1)
clf1 = DecisionTreeClassifier(min_samples_split = 7,
                               min_samples_leaf = 4,
                               random_state = 5)
clf1.fit(X_train, y_train)

clf2 = DecisionTreeClassifier(min_samples_split = 4,
                               min_samples_leaf = 2,
                               random_state = 5)
clf2.fit(X_train, y_train)
```

Which of the following option is True?

Options :

6406533048138. ✘ `clf1.tree_.max_depth >= clf2.tree_.max_depth`

6406533048139. ✓ `clf1.tree_.max_depth <= clf2.tree_.max_depth`

6406533048140. ✘ `clf1.tree_.max_depth == clf2.tree_.max_depth`

6406533048141. ✘ Insufficient Information

Question Number : 315 Question Id : 640653905367 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Given the following code using BaggingClassifier with KNeighborsClassifier as the base estimator:

```
from sklearn.ensemble import BaggingClassifier
from sklearn.neighbors import KNeighborsClassifier

base_knn = KNeighborsClassifier(n_neighbors=3, weights='distance')

bag_clf = BaggingClassifier(base_knn,
                            n_estimators=30,
                            max_samples=100,
                            bootstrap=False,
                            random_state=42)
```

Which of the following statements is correct?

Options :

6406533048150. ✘ Above code uses bootstrapping to generate samples for each base classifier.

6406533048151. ✘ model will be tested on out of the bags samples.

6406533048152. ✘ Due to `weights='distance'`, each base KNN classifier will treat all neighbors equally in terms of voting power.

6406533048153. ✘ The ensemble will consist of 3 base KNN classifiers.

6406533048154. ✓ None of these

Question Number : 316 Question Id : 640653905370 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the following code for a VotingClassifier. What is the effect of setting `voting='soft'`?

```
from sklearn.ensemble import VotingClassifier
clf1 = LogisticRegression()
clf2 = RandomForestClassifier()
clf3 = SVC(probability=True)
eclf = VotingClassifier(estimators= [('lr', clf1), ('rf', clf2), ('svc', clf3)],
                       voting='soft')
eclf.fit(X_train, y_train)
```

Options :

6406533048163. ✘ The predictions are based on the majority vote.

6406533048164. ✓ The predictions are based on the average of probabilities predicted by each classifier.

6406533048165. ✗ The predictions are based on the weighted sum of the predictions.

6406533048166. ✗ The predictions are based on the classifier with the highest accuracy

Question Number : 317 Question Id : 640653905375 Question Type : MCQ Calculator : Yes

Correct Marks : 4

Question Label : Multiple Choice Question

Suppose that we use Kmeans clustering for a dataset having 100 samples.

The initial centroids for k clusters can be initialized in multiple ways. One such way is shown below

```
km = KMeans(n_clusters=5, init='random', n_init=10, random_state=42)
km.fit(X)
```

Choose the correct statements

Options :

6406533048183. ✓ 5 centroids are randomly initialized 10 times

6406533048184. ✗ 10 centroids are randomly initialized 5 times

6406533048185. ✗ 5 samples in the dataset are selected as initialization point such that they are at least 10 units away from each other

6406533048186. ✗ 10 samples in the dataset are selected as initialization point such that they are at least 5 units away from each other

Sub-Section Number :

8

Sub-Section Id :

640653134370

Question Shuffling Allowed :

Yes

Question Number : 318 Question Id : 640653905344 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Data snooping:

Options :

6406533048076. ✓ Leads to biased estimation on test sets

6406533048077. ✓ Increases the risk of false positives

6406533048078. ✗ Leads to better estimation on training sets

6406533048079. ✗ Reduces the risk of false positives

Question Number : 319 Question Id : 640653905348 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following algorithms may get impacted by feature scaling?

Options :

6406533048093. ✓ LinearRegression

6406533048094. ✗ DecisionTree

6406533048095. ✓ SVM

6406533048096. ✗ NaiveBayes

Sub-Section Number : 9

Sub-Section Id : 640653134371

Question Shuffling Allowed : Yes

Question Number : 320 Question Id : 640653905354 Question Type : MSQ Calculator : Yes

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(class_weight='balanced', C=0.5)  
model.fit(X, y)
```

Given the code above, which of the following statements is true?

Options :

6406533048114. ✗ The logistic regression model will use equal weights for both the classes in an imbalanced dataset.

6406533048115. ✗ The model does not use any regularization because the parameter C is set.

6406533048116. ✓ The “balanced” mode uses the values of y to automatically adjust weights inversely proportional to class frequencies in the input data.

6406533048117. ✓ The value of C indicates that the model will apply a regularization.

Question Number : 321 Question Id : 640653905361 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements are true?

Options :

6406533048129. ✗ KNeighborsClassifier with high values of n_neighbors produces complex decision boundaries.

6406533048130. ✓ KNeighborsClassifier with high values of n_neighbors produces smooth decision boundaries.

6406533048131. ✓ In KNeighborsClassifier the scale of the features(columns) can impact the decision boundaries.

6406533048132. ✗ None of these

Question Number : 322 Question Id : 640653905363 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which options are correct for Support Vectors in SVM ?

Options :

- 6406533048134. ✓ Support vectors are the data points nearest to the hyperplane
- 6406533048135. ✓ Using these support vectors, we maximize the margin of the classifier.
- 6406533048136. ✗ Using these support vectors, we minimize the margin of the classifier.
- 6406533048137. ✗ None of these

Question Number : 323 Question Id : 640653905371 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following are correct for **Kmeans** clustering algorithm?

Options :

- 6406533048167. ✓ It only finds spherical clusters.
- 6406533048168. ✓ The output of the algorithms depends upon initial cluster centroids.
- 6406533048169. ✗ It can automatically detect most appropriate value of k .
- 6406533048170. ✗ None of these.

Sub-Section Number :

10

Sub-Section Id :

640653134372

Question Shuffling Allowed :

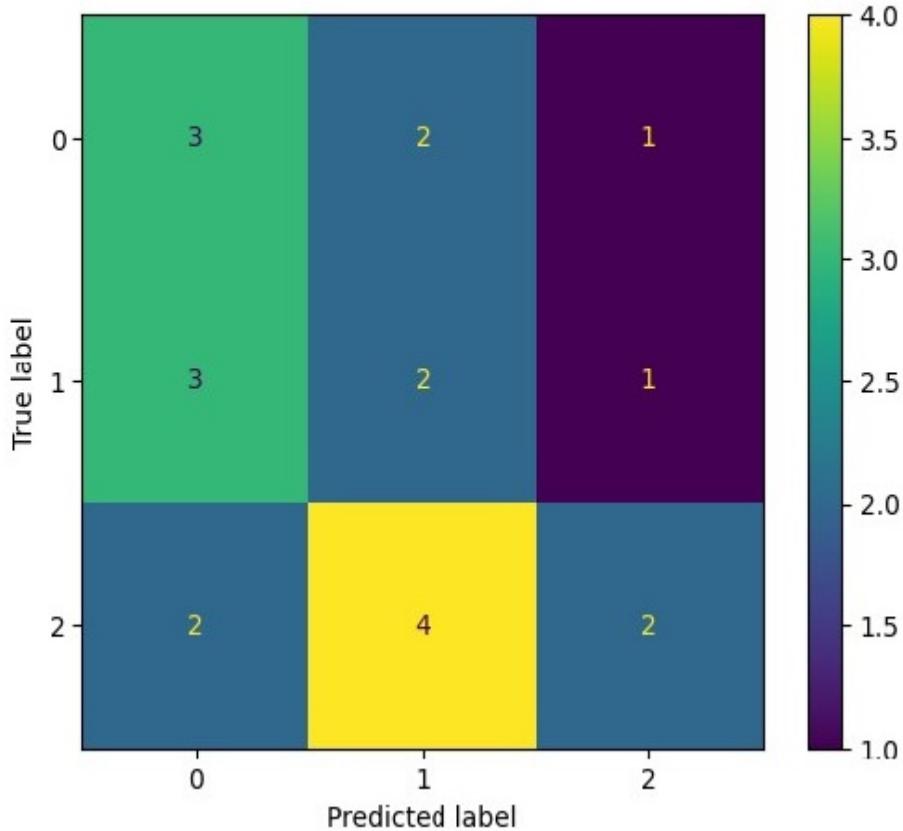
Yes

Question Number : 324 Question Id : 640653905353 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Using the confusion matrix given below. What is the precision score for the label (class) 1 ?



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.25

Question Number : 325 **Question Id :** 640653905356 **Question Type :** SA **Calculator :** None

Correct Marks : 3

Question Label : Short Answer Question

What will be the output of the following code snippet?

```
from sklearn.linear_model import Perceptron
# Sample data
X = [[0, 0], [0, 2], [2, 0], [2, 2]]
y = [1, 1, 1, 2]
clf = Perceptron(tol=None, shuffle=False)
clf.fit(X, y)
print(clf.predict([[0, 1.5]]))
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 326 Question Id : 640653905362 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Consider the following code snippet:

```
from sklearn.neighbors import KNeighborsClassifier  
  
X_train = [[1, 2], [3, 4], [5, 6]]  
y_train = [0, 1, 2]  
  
knn = KNeighborsClassifier(n_neighbors=4)  
knn.fit(X_train, y_train)
```

What will be the output of the following code:

```
print(len(knn.classes_))
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Sub-Section Number : 11

Sub-Section Id : 640653134373

Question Shuffling Allowed : No

Question Id : 640653905357 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (327 to 328)

Question Label : Comprehension

Let X be a feature matrix with shape (1000,5) and y be the label vector with two classes: 0 and 1. Assume that 650 examples of training data belong to class 1. Consider following code:

```
base_clf = DummyClassifier(strategy='most_frequent')
base_clf.fit(X,y)
print(base_clf.score(X,y))
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 327 Question Id : 640653905358 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

What will be the output of the following code?

```
print(recall_score(y, base_clf.predict(X)))
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 328 Question Id : 640653905359 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

What will be the output of the following code?

```
print(precision_score(y, base_clf.predict(X)))
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.64 to 0.66

Section Id :	64065364172
Section Number :	14
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	21
Number of Questions to be attempted :	21
Section Marks :	30
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134374
Question Shuffling Allowed :	No

Question Number : 329 Question Id : 640653905376 Question Type : MCQ Calculator : Yes

Correct Marks : 0

Question Label : Multiple Choice Question

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

6406533048187. ✓ YES

6406533048188. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653134375
Question Shuffling Allowed :	Yes

Question Number : 330 Question Id : 640653905377 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

In the economic flow, what role do households typically play?

Options :

6406533048189. ✗ Suppliers of capital

6406533048190. ✗ Producers of goods

640653048191. ✓ Consumers of goods and services

640653048192. ✗ Regulators of the economy

Question Number : 331 Question Id : 640653905378 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

What are the roles that the Government plays in the economic circular flow model?

Options :

640653048193. ✗ Producer and Consumer

640653048194. ✗ Moderator and Participant

640653048195. ✓ Both Producer and Consumer & Moderator and Participant

640653048196. ✗ None of these

Question Number : 332 Question Id : 640653905379 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

What kind of goods' demand decreases as income increases?

Options :

640653048197. ✗ Superior Good

640653048198. ✓ Inferior Good

640653048199. ✗ Luxury Good

640653048200. ✗ Supply Good

Question Number : 333 Question Id : 640653905380 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

For the Data Given below, which function would you use to count the number of salespeople who exceeded both their Q1 and Q2 quotas.

	A	B	C	D
1	Salesperson	Exceeded Q1 quota	Exceeded Q2 quota	Exceeded Q3 quota
2	Kent	Yes	No	No
3	Wayne	Yes	Yes	No
4	Oliver	Yes	Yes	Yes
5	Allen	No	Yes	Yes

Options :

640653048201. ✗ COUNT(A2:A5,"=Yes",C3:C5,"=Yes")

640653048202. ✓ COUNTIFS(B2:B5,"=Yes",C2:C5,"=Yes")

6406533048203. ✘ COUNTIF(B2:B5,"=Yes",C2:C5,"=Yes")

6406533048204. ✘ COUNTA(C2:C5,"=Yes",D2:D5,"=Yes")

Question Number : 334 Question Id : 640653905381 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following is a comprehensive data source that covers every single household in a country?

Options :

6406533048205. ✘ Annual Survey of Industries

6406533048206. ✘ National Sample Survey

6406533048207. ✓ Census

6406533048208. ✘ Economic Census

Question Number : 335 Question Id : 640653905382 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following is an example of a non-government data source?

Options :

6406533048209. ✘ Economic Census

6406533048210. ✘ National Sample Survey

6406533048211. ✓ Center for Monitoring Indian Economy (CMIE)

6406533048212. ✘ Annual Survey of Industries

Question Number : 336 Question Id : 640653905383 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

The number of heavy vehicle driving licenses issued can be used as a _____ of the potential market size for trucks. (Fill in the Blank with the appropriate response)

Options :

6406533048213. ✘ Lead Indicator

6406533048214. ✘ Lag Indicator

6406533048215. ✘ Supplement Indicator

6406533048216. ✓ Surrogate Indicator

Question Number : 337 Question Id : 640653905384 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following statements best describes the difference between a niche market and a mass market?

Options :

6406533048217. ✓ A niche market targets a small, specific group of customers with specialized needs, while a mass market targets a large, broad group of customers with general needs.
6406533048218. ✗ A niche market involves offering lower-priced products to a wide audience, whereas a mass market involves offering high-end products to a small, exclusive group.
6406533048219. ✗ A niche market typically requires large-scale advertising campaigns to reach a broad audience, while a mass market relies on word-of-mouth and targeted marketing.
6406533048220. ✗ A niche market focuses on standard products that appeal to everyone, while a mass market customizes products to fit individual customer preferences.

Question Number : 338 Question Id : 640653905389 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

What does ABC analysis primarily focus on?

Options :

6406533048233. ✗ Classifying inventory items based on their unit cost
6406533048234. ✗ Categorizing inventory items based on their reorder points
6406533048235. ✓ Grouping inventory items based on their annual monetary usage
6406533048236. ✗ Ranking inventory items based on their lead times

Question Number : 339 Question Id : 640653905390 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following statements is not true about the benefits of implementing an ERP system?

Options :

6406533048237. ✓ Increased data redundancy
6406533048238. ✗ Improved data accuracy and consistency
6406533048239. ✗ Increased process efficiency
6406533048240. ✗ Increased visibility into business operations

Question Number : 340 Question Id : 640653905395 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following is typically not a component of the "job description"?

Options :

6406533048250. ✗ Skills required for the job
6406533048251. ✗ Key responsibilities
6406533048252. ✗ Job performance indicators
6406533048253. ✓ Recruitment process

Question Number : 341 Question Id : 640653905396 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

PayLater has suddenly started running into losses. Which of the following reasons can explain the sudden losses based on the graph shown below?



Options :

- 640653048254. ❌ Decrease in the declining rate of credit applications
- 640653048255. ❌ Increase in the approval rate of credit applications
- 640653048256. ✓ Both Decrease in the declining rate of credit applications & Increase in the approval rate of credit applications
- 640653048257. ❌ None of these

Question Number : 342 Question Id : 640653905397 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

Company Orange wants to recruit Software Engineers for its new project. The hiring manager was tasked with choosing the appropriate hiring channel. The manager collected previous hiring data (provided in the table below) to help narrow down the appropriate channel. All channels advertised for the vacant positions on the same day. Which channel has the worst selection success rate? The Selection success rate is defined as the no. of candidates selected to the no. of applications shortlisted

Recruitment Channels	Application Received in 14 days	Application Shortlisted	No. of Candidates appeared for Interview	No. of Candidates Selected	Cost of Advertisement for 14 Days (INR)
Employee Referrals	40	32	24	12	120000
Direct Company Website	60	12	8	2	5000
Social and Professional Media	260	36	16	4	20000
Hiring Portals	220	90	30	6	100000
Print Ads	20	10	8	1	50000

Options :

6406533048258. ✓ Hiring Portals

6406533048259. ✗ Social and Professional Media

6406533048260. ✗ Print Ads

6406533048261. ✗ Employee Referrals

Question Number : 343 Question Id : 640653905399 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

When should A/B test be done?

Options :

6406533048266. ✓ After deploying the model in real world

6406533048267. ✗ After training the model, before testing on test data

6406533048268. ✗ Before training the model

6406533048269. ✗ Before deploying the model in real world

Question Number : 344 Question Id : 640653905400 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

How do online payment companies make money?

Options :

6406533048270. ✗ Interest from loans/credit

6406533048271. ✗ Transaction fees (a small cut from the transaction)

6406533048272. ✗ Monthly subscription

640653048273. ✓ Both Interest from loans/credit and transaction fees

Question Number : 345 Question Id : 640653905401 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

What role does personalized recommendation play in nudging consumers on e-commerce sites?

Options :

640653048274. ✗ To display clickbaits and flashy products to increase website traffic

640653048275. ✗ To offer the same discounts to all customers, ensuring fairness

640653048276. ✓ To suggest products based on browsing history, increasing the likelihood of purchase

640653048277. ✗ To highlight best-selling products only, irrespective of the user's interest

Sub-Section Number : 3

Sub-Section Id : 640653134376

Question Shuffling Allowed : Yes

Question Number : 346 Question Id : 640653905394 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Match the Following

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

Options :

640653048246. ✓ 1-b,2-d,3-a,4-c

640653048247. ✗ 1-d,2-b,3-c,4-a

640653048248. ✗ 1-a,2-c,3-b,4-d

640653048249. ✗ 1-c,2-a,3-d,4-b

Question Number : 347 Question Id : 640653905398 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

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

Options :

640653048262. ✘ Customer pays BCCI, BCCI pays Klipkart, Klipkart pays PayKaro
 640653048263. ✓ BCCI pays PayKaro, PayKaro pays Klipkart, Customer pays BCCI
 640653048264. ✘ Customer pays BCCI, BCCI pays PayKaro, PayKaro pays Klipkart
 640653048265. ✘ Customer pays PayKaro, PayKaro pays BCCI, BCCI pays Klipkart

Sub-Section Number : 4
Sub-Section Id : 640653134377
Question Shuffling Allowed : No

Question Id : 640653905385 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (348 to 350)

Question Label : Comprehension

Based on the data provided, answer the given subquestions

SKU	Product Name	Unit Price	Monthly Sales						Avg. Monthly Sales	Opening Stock
			1	2	3	4	5	6		
LAP001	NovaBook Pro	\$1,299	100	120	150	180	200	220	161.7	290
LAP002	Stellar 15	\$1,799	80	90	100	110	120	130	105.0	250
LAP003	QuantumBook 16	\$2,499	50	60	70	80	90	100	75.0	190
LAP004	TitanBook X1 Carbon	\$1,999	30	40	50	60	70	80	55.0	115
LAP005	EclipseBook x360	\$1,499	20	30	40	50	60	70	45.0	95
LAP006	AuroraBook Studio	\$1,199	10	15	20	25	30	35	22.5	50
LAP007	ZephyrBook 17	\$999	5	10	15	20	25	30	17.5	40

Sub questions

Question Number : 348 Question Id : 640653905386 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Which SKU has the highest Days of Inventory?

Options :

640653048221. ✘ LAP002

640653048222. ✓ LAP003

640653048223. ✘ LAP006

640653048224. ✘ LAP007

Question Number : 349 Question Id : 640653905387 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

If the profit margin for the sale of a laptop is 10%, what is the total profit earned from the sale of

LAP005?

Options :

6406533048225. ✘ 42505

6406533048226. ✘ 40890

6406533048227. ✘ 41782

6406533048228. ✓ 40473

Question Number : 350 Question Id : 640653905388 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

What percentage of total revenue do the SKUs LAP004 and LAP005 contribute together?

Options :

6406533048229. ✘ 10%

6406533048230. ✓ 20%

6406533048231. ✘ 15%

6406533048232. ✘ 25%

Question Id : 640653905391 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (351 to 352)

Question Label : Comprehension

The Data given is of Shaktimaan Industries who manufacture specialized components for Aerospace application for the month of August 2024.

- The factory functions for 2 shifts on weekdays and only one shift on Saturdays.
 - Assume a scrap rate of 10% per shift. For example, if a shift produces 152 components, the scrap will be $0.1 \times 152 = 15.2$.
- However, since 15.2 scrap components makes no sense, consider it as 16.
- The Assembly line was designed for a rated capacity of 125 units per shift.

AUGUST 2024						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
			1 216	2 244	3 139	4 Holiday
5 212	6 282	7 248	8 278	9 284	10 Power Cut	11 Holiday
12 PM*	13 242	14 296	15 Holiday	16 288	17 106	18 Holiday
19 208	20 244	21 212	22 276	23 208	24 123	25 Holiday
26 206	27 272	28 UPM**	29 260	30 270	31 188	

*PM – Planned Maintenance

**UPM – Unplanned Maintenance

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 351 Question Id : 640653905392 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

What is the OEE for the Friday shifts?

(express in terms of %, e.g., if answer is 0.7359, express it as 73.59)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

92.5 to 93.5

Question Number : 352 Question Id : 640653905393 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

What is the MAPE of the Thursday shifts?

Options :

6406533048242. ✓ 0.1

6406533048243. ✗ 0.15

6406533048244. ✗ 0.2

6406533048245. ✗ 0.25

Business Analytics

Section Id :	64065364173
Section Number :	15
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
Section Marks :	45
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134378
Question Shuffling Allowed :	No

Question Number : 353 Question Id : 640653905402 Question Type : MCQ Calculator : Yes

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 :

6406533048278. ✓ YES

6406533048279. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653134379
Question Shuffling Allowed :	Yes

Question Number : 354 Question Id : 640653905403 Question Type : MSQ Calculator : Yes

Correct Marks : 0.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

The computed p-value of a chi-square goodness-of-fit test is 0.067. Then, which of the following statements are **TRUE**

Options :

- 6406533048280. ✘ At a 5% level of significance, the null hypothesis is rejected
- 6406533048281. ✓ At a 5% level of significance, the null hypothesis is not-rejected
- 6406533048282. ✘ At a 10% level of significance, the null hypothesis is rejected
- 6406533048283. ✓ At a 10% level of significance, the null hypothesis is not-rejected
- 6406533048284. ✘ At a 5% level of significance, the alternative hypothesis is rejected
- 6406533048285. ✘ At a 5% level of significance, the alternative hypothesis is not-rejected
- 6406533048286. ✘ At a 10% level of significance, the alternative hypothesis is rejected
- 6406533048287. ✘ At a 10% level of significance, the alternative hypothesis is not-rejected
- 6406533048288. ✘ None of these

Sub-Section Number :	3
Sub-Section Id :	640653134380
Question Shuffling Allowed :	Yes

Question Number : 355 Question Id : 640653905407 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

The objective function of the linear programming model using pair-wise judgments:

Options :

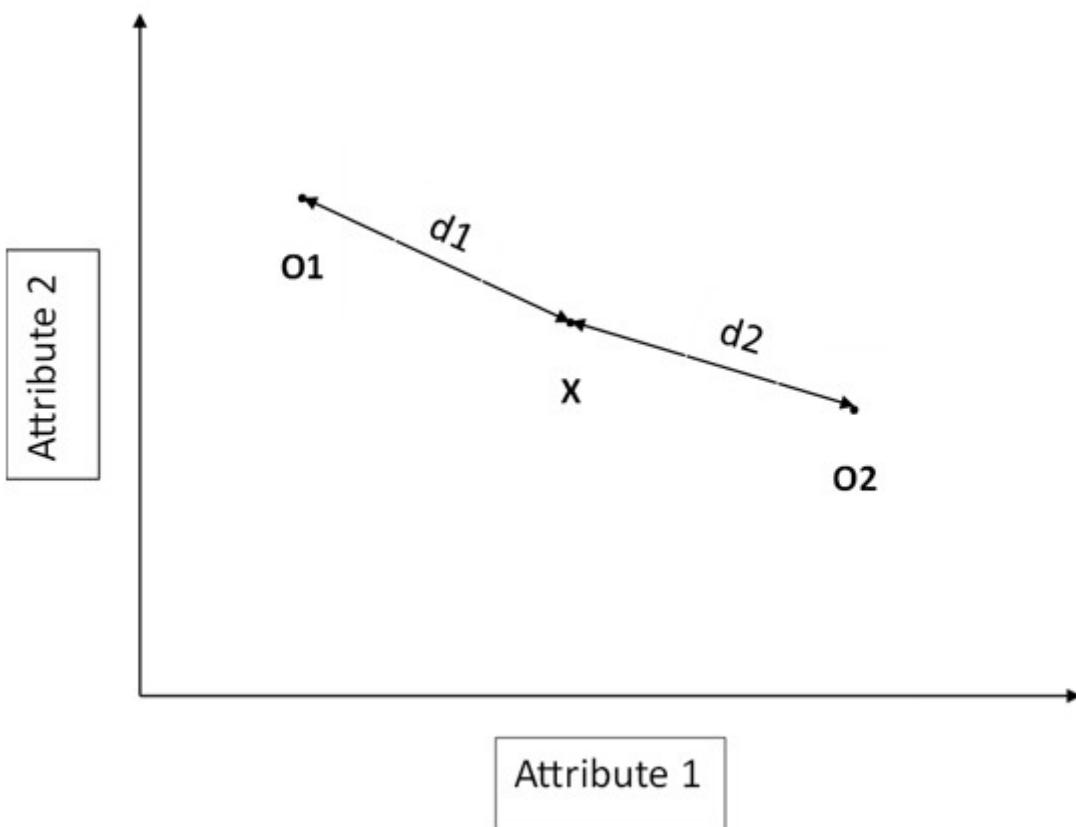
- 6406533048302. ✘ Maximize the distance from the ideal point
- 6406533048303. ✘ Minimize the distance from the ideal point
- 6406533048304. ✓ Minimize the poorness of fit
- 6406533048305. ✘ Both Maximize the distance from the ideal point & Minimize the poorness of fit
- 6406533048306. ✘ Both Minimize the distance from the ideal point & Minimize the poorness of fit

Question Number : 356 Question Id : 640653905411 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

In the below diagram, the customer wants to decide between the products O1 & O2, and x denotes the coordinates of the ideal product. Which of the following are true?



Options :

6406533048319. ✓ Customers will prefer O1 when $d_2 > d_1$

6406533048320. ✗ Customers will prefer O2 when $d_1 < d_2$

6406533048321. ✗ Both Customers will prefer O1 when $d_2 > d_1$ & Customers will prefer O2 when $d_1 < d_2$

6406533048322. ✗ None of these

Sub-Section Number :

4

Sub-Section Id :

640653134381

Question Shuffling Allowed :

Yes

Question Number : 357 Question Id : 640653905406 Question Type : MCQ Calculator : Yes

Correct Marks : 1.5

Question Label : Multiple Choice Question

Assume 5 factories are producing the same output of 1000 units. But, the resources used i.e. labour and raw materials are different. Which of the following factories are efficient?

Factory	Labour	Raw Material
Factory A	100	171
Factory B	105	175
Factory C	108	162
Factory D	104	165
Factory E	109	170

Options :

6406533048297. ✗ A, B, D

6406533048298. ✘ B, C, D

6406533048299. ✓ A, C, D

6406533048300. ✘ A, E, D

6406533048301. ✘ B, D, E

Question Number : 358 Question Id : 640653905409 Question Type : MCQ Calculator : Yes

Correct Marks : 1.5

Question Label : Multiple Choice Question

In a conjoint problem with 4 products and 2 attributes, how many pair-wise preferences are possible?

Options :

6406533048311. ✘ 8

6406533048312. ✓ 6

6406533048313. ✘ 16

6406533048314. ✘ 12

Question Number : 359 Question Id : 640653905410 Question Type : MCQ Calculator : Yes

Correct Marks : 1.5

Question Label : Multiple Choice Question

If the attribute values in the conjoint analysis is a continuous variable and the data is collected in a pairwise order, then what approach can be used:

Options :

6406533048315. ✓ Optimization approach

6406533048316. ✘ Regression approach

6406533048317. ✘ Statistical approach

6406533048318. ✘ Optimization approach or Statistical approach

Sub-Section Number :

5

Sub-Section Id :

640653134382

Question Shuffling Allowed :

Yes

Question Number : 360 Question Id : 640653905405 Question Type : MSQ Calculator : Yes

Correct Marks : 1.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

There are 6 business units and you are using the DEA to compare them. You solve the LP for business unit 5. You find from the constraint expression that business unit 5 has obtained an efficiency of 0.7 and business unit 6 has obtained an efficiency of 1 with the optimal weights of business unit 5. Which of the following statements is correct?

Options :

6406533048293. ✘ Business unit 5 will be efficient

6406533048294. ✓ Business unit 6 will be efficient

640653048295. ✓ Business unit 5 will be inefficient

640653048296. ✗ Business unit 6 will be inefficient

Sub-Section Number :

6

Sub-Section Id :

640653134383

Question Shuffling Allowed :

Yes

Question Number : 361 Question Id : 640653905404 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following are true:

Options :

640653048289. ✓ Productive efficiency frontiers are all combinations of outputs such that the production of one unit cannot be increased without sacrificing without sacrificing the other.

640653048290. ✓ Organizations that do not find themselves on the Economic frontier are called inefficient economic units or organizations.

640653048291. ✓ Productive efficiency focuses on maximizing the given output under given constraints without focusing on optimally allocating the products.

640653048292. ✗ DEA focuses on the technology to improve the productive efficiency.

Question Number : 362 Question Id : 640653905408 Question Type : MSQ Calculator : Yes

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

What is the format of data needed for performing the conjoint analysis using the Statistical or Linear Regression Approach?

Options :

640653048307. ✓ Consumer Choice Data is Ratings

640653048308. ✗ Consumer Choice Data is Pairwise Comparison

640653048309. ✗ Value of the attributes are continuous

640653048310. ✓ Value of the product attributes are categorical

Sub-Section Number :

7

Sub-Section Id :

640653134384

Question Shuffling Allowed :

No

Question Id : 640653905423 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (363 to 365)

Question Label : Comprehension

The weekly sales in 4 retail stores selling 3 styles of jeans are given in Table-1. The aim is to see if the sales of jeans (jeans styles) is independent across the different stores. Then answer the given subquestions.

Jeans Style	Number of jeans of a particular style sold in a week at store			
	1	2	3	4
A	72	70	112	43
B	80	76	114	54
C	50	45	89	30

Table-1

Sub questions

Question Number : 363 Question Id : 640653905424 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the expected number of jeans of Style-B that would be sold in Store-3? (*Note: Input your answer rounded to two decimal places. For example, if your answer is "1.235" then enter the answer as "1.24"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

121 to 123

Question Number : 364 Question Id : 640653905425 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

How many degrees of freedom does are present in the hypothesis test conducted for this problem? (*Note: Input your answer rounded to two decimal places. For example, if your answer is "1.235" then enter the answer as "1.24"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Question Number : 365 Question Id : 640653905426 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

If the tabulated value for the test statistic is 5.78 and the computed value of the test statistic is 2.7, then which of the following statements are TRUE

Options :

640653048334. ❌ Reject the Null and conclude that the sales of jeans (jeans styles) across different stores is independent
640653048335. ❌ Reject the Null and conclude that the sales of jeans (jeans styles) across different stores is NOT independent
640653048336. ❌ Do not reject the Null and conclude that the sales of jeans (jeans styles) across different stores is NOT independent
640653048337. ❌ Cannot say as the alternative hypothesis is not specified
640653048338. ✓ None of these

Question Id : 640653905427 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (366 to 368)

Question Label : Comprehension

DMS lighting produces 3 types of bulbs (Type-A, Type-B and Type-C). The probability that a Type-A bulb will give more than 100 hours (≥ 100 hours) of life is 0.7, with the corresponding probabilities of Type-B and Type-C bulbs being 0.4 and 0.3 respectively. In any production, 20% of the bulbs are of Type-A, 30% are of Type-B and 50% are of Type-C. Then answer the given subquestions

Sub questions

Question Number : 366 Question Id : 640653905428 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the probability that a bulb from the production lot will give a life of more than 100 hours?
*(Note: Input your answer rounded **to two decimal places**. For example, if your answer is "1.235" then enter the answer as "1.24")*

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.40 to 0.42

Question Number : 367 Question Id : 640653905429 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

If a randomly selected bulb from the production lot has a life of more than 100 hours, then what is the probability that it was of Type-B? *(Note: Input your answer rounded **to two decimal places**. For example, if your answer is "1.235" then enter the answer as "1.24")*

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.28 to 0.30

Question Number : 368 **Question Id :** 640653905430 **Question Type :** SA **Calculator :** None

Correct Marks : 1

Question Label : Short Answer Question

DMS is giving a replacement warranty for bulbs that last for less than 100 hours of life. The replacement will cost Rs. 2 for every Type-A bulb, Rs. 1.75 for every Type-B bulb and Rs. 3 for every Type-C bulb. Then, if 10,000 bulbs are produced and sold in a year, what would be the total warranty related cost that DMS will expect to incur? (*Note: Input your answer rounded to two decimal places. For example, if your answer is "1.235" then enter the answer as "1.24"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

14849 to 14851

Sub-Section Number : 8

Sub-Section Id : 640653134385

Question Shuffling Allowed : No

Question Id : 640653905412 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix

Calculator : None

Question Numbers : (369 to 370)

Question Label : Comprehension

There are 5 business units where we measure the efficiency based on two outputs and one input. You are solving the optimization problem for business unit 4 and you find that the efficiency is 0.8. You find that the dual variables corresponding to the constraints of business units 3 and 5 are non-zero and the dual variables corresponding to the constraints of other units are zero. The dual variables corresponding to the constraints of business units 3 and 5 are 0.5 and 0.3 respectively. You are given the following table where sales and loyal customers are the two outputs. Answer the given subquestions.

	Sales	Loyal Customers
BU 3	12000	100
BU 5	10000	120

Sub questions

Question Number : 369 Question Id : 640653905413 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

How much is the sales in HCU 4?

Hint: Round-off up to 2 decimal places

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

11250

Question Number : 370 Question Id : 640653905414 Question Type : SA Calculator : None

Correct Marks : 2

Question Label : Short Answer Question

How many loyal customers must be there in HCU 4?

Hint: Round-off up to 2 decimal places

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

107 to 108

Question Id : 640653905431 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (371 to 376)

Question Label : Comprehension

Dr. Milo wants to advertise his new brand of tuition centres called "Torture Students". Currently promotion plans are underway for this year's admission. Advertising alternatives include TV, Radio and Social Media. The estimated audiences per advertisement (who will enrol after viewing the advertisement) and costs per advertisement for the different alternatives are shown in Table-2. To ensure a balanced use of advertisement media (1) radio advertisements must not exceed 70% of the total number of advertisements authorised (2) amount authorised for TV advertisements should account for at least 30% of the total spending (3) Amount of spending on social media advertisements cannot exceed more than 25% of the other two spending. The promotional budget is limited to Rs. 1,82,000, and Dr. Milo wants to use all the available money to maximize the number of enrolments. Then answer the given subquestions.

<i>Component</i>	<i>TV</i>	<i>Radio</i>	<i>Social Media</i>
Estimated audiences per advertisement (who will enrol after viewing the advertisement) (Numbers/ Advertisement)	4,000	1,800	10,000
Costs per advertisement (Rs./ Advertisement)	Rs. 2500	Rs. 400	Rs. 750

Table-2

Sub questions

Question Number : 371 Question Id : 640653905432 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

How many decision variables (count) are present in the standard form of the primal problem?
(Note: Specify the count of variables. **Not the count of notations**)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 372 Question Id : 640653905433 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

How many constraints (excluding the non-negativity constraints) are present in the standard form of the primal? (Note: Specify the count of constraints. **Not the count of constraints in notation format**)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 373 Question Id : 640653905434 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

If the standard form of the primal is converted to a dual, then how many constraints (excluding the non-negativity constraints) are present in the dual? (Note: Specify the count of constraints. **Not the count of constraints in notation format**)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 374 Question Id : 640653905435 Question Type : MCQ Calculator : Yes

Correct Marks : 0.5

Question Label : Multiple Choice Question

If Dr. Milo has decided to invest Rs. 1,05,000 in TV and Rs. 31,500 in Social Media and Rs. 45,200 in Radio. Then has he acted like a true operations expert and found a Feasible solution?

Options :

6406533048345. ❌ Yes, he is a great operations expert as the above is a feasible solution

6406533048346. ✓ No, he is not an expert but a fraud as the above is NOT a feasible solution

Question Number : 375 Question Id : 640653905436 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

For the sake of argument, assume that Dr. Milo is an operations expert (irrespective of your answer to the previous question). Then, for the solution (Rs. 1,05,000 in TV and Rs. 31,500 in Social Media and Rs. 45,200 in Radio are made) how many (count) decision variables in the dual (which is formulated based on the standard form of the primal) will have a **non-zero** value?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 376 Question Id : 640653905437 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

For the sake of argument, assume that Dr. Milo is an operations expert (irrespective of your answer to the previous question). Then, for the solution (where an investment of Rs. 1,05,000 in TV and Rs. 31,500 in Social Media and Rs. 45,200 in Radio are made) what is the **objective function value** for 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 :

-791400

Sub-Section Number :

9

Sub-Section Id :

640653134386

Question Shuffling Allowed :

No

Question Id : 640653905415 Question Type : COMPREHENSION Sub Question Shuffling

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (377 to 383)

Question Label : Comprehension

A travel company wants to understand its model performance of a classification problem where the task is to classify if its customer will be granted with a tourist visa or not (assume granted = Class 1 and Not Granted as Class 0). Using the table given below, answer the given subquestions

S.No	y_act	y_pred
1	Not Granted	Granted
2	Not Granted	Not Granted
3	Granted	Not Granted
4	Granted	Granted
5	Granted	Granted
6	Not Granted	Granted
7	Granted	Granted
8	Granted	Not Granted
9	Not Granted	Granted
10	Not Granted	Not Granted
11	Not Granted	Not Granted
12	Granted	Granted
13	Granted	Granted
14	Not Granted	Not Granted

Sub questions

Question Number : 377 Question Id : 640653905416 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the accuracy of the model?

Hint: Round your answer to two decimal places and answer them in terms of percentage. Example: If your answers is 0.735, write it as 73.50.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

63.8 to 64.6

Question Number : 378 Question Id : 640653905417 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the precision of class 1?

Hint: Round your answer to two decimal places and answer them in terms of percentage. Example: If your answers is 0.735, write it as 73.50.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

62.3 to 62.8

Question Number : 379 Question Id : 640653905418 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the recall of class 1?

Hint: Round your answer to two decimal places and answer them in terms of percentage. Example: If your answers is 0.735, write it as 73.50.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

71.0 to 71.6

Question Number : 380 Question Id : 640653905419 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the precision of class 0?

Hint: Round your answer to two decimal places and answer them in terms of percentage. Example: If your answers is 0.735, write it as 73.50.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

66.4 to 66.85

Question Number : 381 Question Id : 640653905420 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the recall of class 0?

Hint: Round your answer to two decimal places and answer them in terms of percentage. Example: If your answers is 0.735, write it as 73.50.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

56.9 to 57.5

Question Number : 382 Question Id : 640653905421 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the Sensitivity for the model?

Hint: Round your answer to two decimal places and answer them in terms of percentage. Example: If your answers is 0.735, write it as 73.50.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

71.0 to 71.6

Question Number : 383 Question Id : 640653905422 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the Specificity for the model?

Hint: Round your answer to two decimal places and answer them in terms of percentage. Example: If your answers is 0.735, write it as 73.50.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

56.9 to 57.6

Sub-Section Number : 10

Sub-Section Id : 640653134387

Question Shuffling Allowed : No

Question Id : 640653905438 **Question Type :** COMPREHENSION **Sub Question Shuffling**

Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None

Question Numbers : (384 to 391)

Question Label : Comprehension

A company has developed a new fodder for pigs. To model the "increase in weight of a piglet (in pounds) in one week", an experiment is performed in which eight piglets were exclusively feed the fodder. Table-3 below provides the data on "Initial weight (pounds)", "Age of the piglet (weeks)", "Actual Weight gained after one week (pounds)" and "Predicted Weight gained after one week (pounds)". The column "Predicted Weight gained after one week (pounds)" is obtained using Model-1

Piglet Number	Initial Weight (pounds)	Initial Age (weeks)	Actual Weight Gained (pounds)	Predicted Weight Gained (pounds)
1	39	8	7	6.1
2	52	6	6	5.8
3	49	7	8	6.3
4	46	12	10	10.0
5	61	9	9	9.1
6	35	6	5	4.1
7	25	7	3	3.9
8	55	4	4	4.5

Table-3

The different models developed are presented in the below Figures (which specify the partial regression outputs).

Given this information, answer the given subquestions

SUMMARY OUTPUT					
Regression Statistics					
Multiple R		X1			
R Square		X2			
Adjusted R Square		X3			
Standard Error					
Observations		8			
ANOVA					
	df	SS	MS	F	
Regression		X4			
Residual					
Total		X5			
	Coefficients	Standard Error	t Stat		
Intercept	-4.2	1.89			
Initial Weight (pounds)	0.1	0.03			
Initial Age (weeks)	0.8	0.16			

Model-1: Partial output when regression "Weight Gained (pounds)", "Initial Weight (pounds)" and "Initial Age (weeks)"

ANOVA		
	df	SS
Regression		450.76
Residual		506.75
Total	7	
	Coefficients	
Intercept	44.65	
Initial Age (weeks)	0.09	

Model-2: Partial output when regressing "Initial Weight (pounds)" and "Initial Age (weeks)"

ANOVA		
	df	SS
Regression		22.5
Residual		17.37
Total	7	
	Coefficients	
Intercept	7.22	
Initial Weight (pounds)	0.004	

Model-3: Partial output when regressing "Initial Weight (pounds)" and "Initial Age (weeks)"

ANOVA		
	df	SS
Regression		33.44
Residual		
Total	7	39.875

Coefficients		
Intercept		5.52
Initial Weight (pounds)		1.04
Weight Gained (pounds)		-0.11

Model-4: Partial output when regression "Weight Gained (pounds)", "Initial Weight (pounds)" and "Initial Age (weeks)"

ANOVA		
	df	SS
Regression		649.5
Residual		308
Total	7	957.5

Coefficients		
Intercept		41.48
Initial Age (weeks)		-5.19
Weight Gained (pounds)		6.5

Model-5: Partial output when regression "Weight Gained (pounds)", "Initial Weight (pounds)" and "Initial Age (weeks)"

Sub questions

Question Number : 384 Question Id : 640653905439 Question Type : SA Calculator : None

Correct Marks : 1.5

Question Label : Short Answer Question

What is the value of "X1" in Model-1? (*Note: Input your answer rounded to two decimal places. For example, if your answer is "1.235" then enter the answer as "1.24"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.92 to 0.95

Question Number : 385 Question Id : 640653905440 Question Type : SA Calculator : None

Correct Marks : 1.5

Question Label : Short Answer Question

What is the value of "X2" in Model-1? (Note: Input your answer rounded **to two decimal places**. For example, if your answer is "1.235" then enter the answer as "1.24")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.85 to 0.88

Question Number : 386 **Question Id :** 640653905441 **Question Type :** SA **Calculator :** None

Correct Marks : 1.5

Question Label : Short Answer Question

What is the value of "X3" in Model-1? (Note: Input your answer rounded **to two decimal places**. For example, if your answer is "1.235" then enter the answer as "1.24")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.80 to 0.83

Question Number : 387 **Question Id :** 640653905442 **Question Type :** SA **Calculator :** None

Correct Marks : 2

Question Label : Short Answer Question

What is the value of "X4" in Model-1? (Note: Input your answer rounded **to two decimal places**. For example, if your answer is "1.235" then enter the answer as "1.24")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

36 to 37

Question Number : 388 **Question Id :** 640653905443 **Question Type :** SA **Calculator :** None

Correct Marks : 2

Question Label : Short Answer Question

What is the value of "X5" in Model-1? (Note: Input your answer rounded **to two decimal places**. For example, if your answer is "1.235" then enter the answer as "1.24")

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

41 to 43

Question Number : 389 Question Id : 640653905444 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the value of the F-statistic for Model-1? (*Note: Input your answer rounded to two decimal places. For example, if your answer is "1.235" then enter the answer as "1.24"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

16.0 to 16.50

Question Number : 390 Question Id : 640653905445 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the VIF associated with "Initial Age (weeks)"? (*Note: Input your answer rounded to two decimal places. For example, if your answer is "1.235" then enter the answer as "1.24"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

2.10 to 2.40

Question Number : 391 Question Id : 640653905446 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

What is the VIF associated with "Initial Weight (pounds)"? (*Note: Input your answer rounded to two decimal places. For example, if your answer is "1.235" then enter the answer as "1.24"*)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

1.70 to 1.99