

Notations :

1.Options shown in **green** color and with ✓ icon are correct.

2.Options shown in **red** color and with ✗ icon are incorrect.

Question Paper Name :

IIT M DIPLOMA AN2 EXAM QDD2 03 Dec
2023

Subject Name :

2023 Dec: IIT M AN2 EXAM QDD2

Creation Date :

2023-11-28 10:15:32

Duration :

120

Total Marks :

715

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 :	64065316190
Group Maximum Duration :	0
Group Minimum Duration :	90
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	715
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

CT

Section Id :	64065348499
---------------------	-------------

Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	15
Number of Questions to be attempted :	15
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100782
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 1 Question Id : 640653689392 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : COMPUTATIONAL THINKING (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406532306320. ✓ YES

6406532306321. * NO

Question Number : 2 Question Id : 640653689393 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

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

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

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

Olympics

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

Three sample cards out of 30 for Shopping Bills dataset

Item List

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

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

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

Options :

6406532306322. ✓ Useful Data has been mentioned above.

6406532306323. ❌ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 640653100783

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 3 Question Id : 640653689394 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the values of **mList** after execution of the following pseudocode?

```
L = [[1, 100, 'A'], [2, 99, 'B'], [3, 98, 'C'], [4, 97, 'D'], [5, 96, 'E']]  
mList = []  
foreach element in L{  
    z = DoSomething(element)  
    mList = mList ++ [z]  
}  
Procedure DoSomething(X)  
    a = rest(X)  
    return(first(a)*2)  
End DoSomething
```

Options :

[2, 4, 6, 8, 10]

6406532306324. ✘

[1, 200, 'A', 2, 198, 'B', 3, 196, 'C', 4, 194, 'D', 5, 192, 'E']

6406532306325. ✘

[200, 198, 196, 194, 192]

6406532306326. ✓

[2, 100, 'A', 4, 99, 'B', 6, 98, 'C', 8, 97, 'D', 10, 96, 'E']

6406532306327. ✘

Question Number : 4 Question Id : 640653689401 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

The following pseudocode is executed on the "**Words**" dataset. What will the values of **A** and **B** represent at the end of the execution of the below pseudocode?

```
A=[]
B=[]
while(Table 1 has more rows){
    Read the top row X from Table 1
    if(X.PartOfSpeech == "Verb"){
        A = A ++ [X.SerialNumber]
        if(X.LetterCount > 5){
            B = B ++ [X.SerialNumber]
        }
    }
    Move X to Table 2
}
```

Options :

6406532306345. ❌ **A** contains serial numbers of all verbs, while **B** contains serial numbers of other words

6406532306346. ❌ **A** contains serial numbers of all verbs, while **B** contains serial numbers for other words with letter count greater than 5

6406532306347. ✓ **A** contains serial numbers of all verbs, while **B** contains serial numbers of all verbs with letter count greater than 5

6406532306348. ❌ **A** contains serial numbers of all verbs and **B** contains serial numbers of words other than verbs

Question Number : 5 Question Id : 640653689403 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

The following pseudocode is executed on the "**Shopping Bills**" dataset. What will **d** represent at the end of the execution of the below pseudocode?

```
d={}
while(Table 1 has more rows){
    Read the first row X in Table 1
    d = doSomething(X, d, "SV Stores")
    d = doSomething(X, d, "Big Bazaar")
    d = doSomething(X, d, "Sun General")
    Move X to Table 2
}
Procedure doSomething(Y, D, S)
    if(isKey(D, S)){
        D[S] = D[S] ++ [Y.TotalBillAmount]
    }
    else{
        D[S] = [Y.TotalBillAmount]
    }
    return D
End doSomething
```

Options :

6406532306355. ✘ The dictionary **d** represents the sum of all total bill amounts with respect to the shop name parameter.

6406532306356. ✓ The dictionary **d** represents a list of total bill amounts with respect to the shop name parameter.

6406532306357. ✘ The dictionary **d** represents the count of bills with respect to the shop name parameter.

6406532306358. ✘ The dictionary **d** represents a list of shop names with respect to the total bill amount.

Question Number : 6 Question Id : 640653689404 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

The following pseudocode is executed on the "Words" dataset. What will be the values of **B** and **C** represent at the end of the execution of the below pseudocode?

```
A={}
while(Table 1 has more rows){
    Read the first row X in Table 1
    A = doSomething(A, X.PartOfSpeech)
    Move X to Table 2
}
B = 0
C = None
foreach k in keys(A){
    if(A[k] > B) {
        B = A[k]
        C = k
    }
}
Procedure doSomething(Y, P)
    if(isKey(Y, P)){
        Y[P] = Y[P] + 1
    }
    else{
        Y[P] = 1
    }
    return Y
End doSomething
```

Options :

6406532306359. ✘ **B** contains the minimum frequency count of part of speech and **C** contains the corresponding part of speech

6406532306360. ✘ **C** contains the minimum frequency count of part of speech and **B** contains the corresponding part of speech

6406532306361. ✘ **C** contains the maximum frequency count of part of speech and **B** contains the corresponding part of speech

6406532306362. ✓ **B** contains the maximum frequency count of part of speech and **C** contains the corresponding part of speech

Sub-Section Number :

3

Sub-Section Id :

640653100784

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 7 Question Id : 640653689395 Question Type : MSQ Is Question

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

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Alex and Elena play a game every time they meet. They write the score of each round in the form **[i,j]** where **i** stores the score for Alex and **j** stores the score for Elena. The results of the series of rounds are recorded in **scoreList** (which is a list of lists).

For example, **scoreList** = [[20,18],[15,19],[8,19],[12,7]] records that in the first round Alex scored 20 and Elena scored 18, in the second round Alex scored 15 and Elena scored 19, and so on. The person with the higher total score is the winner.

To determine the winner, a procedure **findGameWinner(x)** is called that accepts **scoreList** as a parameter and returns **winner**. If Alex is the winner, then **winner** = 1; if Elena is the winner, then **winner** = 2 ; and if it is a draw then **winner** = 0.

Which of the following procedure(s) correctly identify/identifies the winner?

Options :

6406532306328. ✓

```

Procedure findGameWinner(scoreList)
    alex_Score = 0
    elena_Score = 0
    winner = 0
    foreach roundScore in scoreList{
        alex_RoundScore = first(roundScore)
        elena_RoundScore = last(roundScore)
        alex_Score = alex_Score + alex_RoundScore
        elena_Score = elena_Score + elena_RoundScore
    }
    if( alex_Score > elena_Score ){
        winner = 1
    }
    else if( elena_Score > alex_Score ){
        winner = 2
    }
    return(winner)
end findGameWinner

```

```

Procedure findGameWinner(scoreList)
    alex_Score = 0
    elena_Score = 0
    winner = -1
    foreach roundScore in scoreList{
        alex_RoundScore = last(roundScore)
        elena_RoundScore = first(roundScore)
        alex_Score = alex_Score + alex_RoundScore
        elena_Score = elena_Score + elena_RoundScore
    }
    if( alex_Score > elena_Score ){
        winner = 1
    }
    else if( elena_Score > alex_Score ){
        winner = 2
    }
    return(winner)
end findGameWinner

```

6406532306329. *

6406532306330. *

```

Procedure findGameWinner(scoreList)
    alex_Score = 0
    elena_Score = 0
    winner = 0
    foreach roundScore in scoreList{
        alex_RoundScore = first(roundScore)
        elena_RoundScore = last(roundScore)
        alex_Score = alex_Score + alex_RoundScore
        elena_Score = elena_Score + elena_RoundScore
    }
    if( alex_Score > elena_Score ){
        winner = 2
    }
    else if( elena_Score >= alex_Score ){
        winner = 1
    }
    return(winner)
end findGameWinner

```

```

Procedure findGameWinner(scoreList)
    alex_Score = 0
    elena_Score = 0
    winner = 0
    foreach roundScore in scoreList{
        alex_RoundScore = first(roundScore)
        elena_RoundScore = last(roundScore)
        alex_Score = alex_Score + alex_RoundScore
        elena_Score = elena_Score + elena_RoundScore
    }
    if( alex_Score > elena_Score ){
        winner = 1
    }
    else{
        winner = 2
    }
    return(winner)
end findGameWinner

```

6406532306331. *

Sub-Section Id :	640653100785
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 8 Question Id : 640653689396 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

Let **Z** be a row in the "Words" table such that **Z.Word** = "reluctant". What will be the value of **alphaDict['t']** at the end of the execution of the following pseudocode?

```

alphaDict = {'t':2, 'c':1, 'a':1, 's':0}
alphaDict = updateDict(Z, alphaDict)
Procedure updateDict(Z, Dict)
    i = 1
    while(i <= Z.LetterCount){
        x = ith letter of Z.Word
        if(not isKey(Dict, x)){
            Dict[x] = 1
        }
        else{
            Dict[x] = Dict[x] + 1
        }
        i = i + 1
    }
    return(Dict)
End updateDict

```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 9 Question Id : 640653689407 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

Statement

Let **explode(W)** return the list of letters in the word **W**. For example **explode("common")** will return **['c', 'o', 'm', 'm', 'o', 'n']**. What will be the value of **count** at the end of the execution of the following pseudocode?

```
count = 0, letterList = []
wordList = ["beekeeper", "inspects", "hives", "choose"]
foreach word in wordList{
    letterList = explode(word)
    lastLetter = '', flag = False
    foreach letter in letterList{
        if(letter is a vowel and letter == lastLetter){
            flag = True
        }
        lastLetter = letter
    }
    if(flag){
        count = count + 1
    }
}
```

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 : 640653100786

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 10 Question Id : 640653689397 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

The given pseudocode based on "Scores" dataset, which has total **30** cards. What does variable **countT** represent at the end of execution of the following pseudocode?

(Please note that all 30 cards in the "Scores" dataset do not have the same city.)

```
count = 0, countT = 0
sumT = 0, averageT = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    Move X to Table 2
    if(X.CityTown == "Vellore"){
        count = count + 1
    }
    else{
        sumT = sumT + X.Total
    }
}
Restore cards to Table 1
if(count < 30){
    averageT = sumT/(30 - count)
}
while(Table 1 has more rows){
    Read the first row X in Table 1
    Move X to Table 2
    if(X.Total > averageT){
        countT = countT + 1
    }
}
```

Options :

6406532306333. ❌ Total number of students whose total marks is more than average total marks of students who are from Vellore

6406532306334. ✓ Total number of students whose total marks is more than average total marks of students who are not from Vellore

6406532306335. ✖ Total number of students whose total marks is less than average total marks of students who are from Vellore

6406532306336. ✖ Total number of students whose total marks is less than average total marks of students who are not from Vellore

Question Number : 11 Question Id : 640653689405 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

Statement

The **topChem** and **topPhy** are lists of cards having Chemistry marks and Physics marks greater than 75 respectively. Each entry in both lists has the same fields as the "**Scores**" table. What will the value of the list **someList** represent at the end of the execution of the below pseudocode?

```
someList = []
foreach X in topChem{
    foreach Y in topPhy{
        if(X.SeqNo == Y.SeqNo and X.Mathematics > 75){
            someList = someList ++ [X.Name]
        }
    }
}
```

Options :

6406532306363. ✖ It stores the names of students who have scored above 75 in Mathematics

6406532306364. ✖ It stores the names of students who have scored above 75 in both Chemistry and Physics

6406532306365. ✖ It stores the names of students who have scored above 75 in at least one subject

6406532306366. ✓ It stores the names of students who have scored above 75 in all three subjects

Question Number : 12 Question Id : 640653689406 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Statement

The given pseudocode is executed on the “**Words**” dataset. **C** stores the number of nouns which have at least one verb adjacent to it. Choose the correct code fragment to complete the pseudocode.

```
A = [], B = [], C = 0
while(Table 1 has more rows){
    Read the first row X in Table 1
    ****
    * Fill the code *
    ****
    Move X to Table 2
}
foreach Y in B{
    if(member(A, Y - 1) or member(A, Y + 1)){
        C = C + 1
    }
}
```

Options :

```
if(X.PartOfSpeech == "Verb" or X.PartOfSpeech == "Noun"){
    B = B ++ [X.SeqNo]
}
if(X.PartOfSpeech == "Verb" or X.PartOfSpeech == "Noun"){
    A = A ++ [X.SeqNo]
}
```

6406532306367. *

6406532306368. *

```
if(X.PartOfSpeech == "Verb" or X.PartOfSpeech == "Noun"){
    A = A ++ [X.SeqNo]
    if(X.PartOfSpeech == "Noun"){
        B = B ++ [X.SeqNo]
    }
}
```

```
if(X.PartOfSpeech == "Verb"){
    B = B ++ [X.SeqNo]
}
if(X.PartOfSpeech == "Noun"){
    A = A ++ [X.SeqNo]
}
```

6406532306369. *

```
if(X.PartOfSpeech == "Verb"){
    A = A ++ [X.SeqNo]
}
if(X.PartOfSpeech == "Noun"){
    B = B ++ [X.SeqNo]
}
```

6406532306370. ✓

Sub-Section Number : 6

Sub-Section Id : 640653100787

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689398 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (13 to 14)

Question Label : Comprehension

Consider the following pseudocode.

```
M = [0]
MA = [[9],[9,8],[9,8,7]]
MB = [], MC = []
foreach A in MA {
    foreach B in A {
        MB = [B] ++ MB
        M = [last(MB) + B]
    }
    MC = [MB] ++ MC
    MB = []
}
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 13 Question Id : 640653689399 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the value of **M**

at the end of execution of

the given pseudocode?

Options :

[**14**]

6406532306337. *

[**17**]

6406532306338. *

[16]

6406532306339. ✓

[18]

6406532306340. ✗

Question Number : 14 Question Id : 640653689400 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

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

Options :

[[7, 8, 9], [8, 9], [9]]]

6406532306341. ✓

[7, 8, 9, 8, 9, 9]

6406532306342. ✗

[[9, 8, 7], [9, 8], [9]]]

6406532306343. ✗

6406532306344. ✗

[9, 8, 7, 9, 8, 9]

Sub-Section Number : 7

Sub-Section Id : 640653100788

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 15 Question Id : 640653689402 Question Type : MSQ Is Question

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

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

The below procedure is to build a list of serial numbers of specific parts of speech in the **Words** dataset. But the procedure may have mistakes. Identify all such mistakes (if any). [MSQ]

```
1: Procedure BuildList(field)
2:     L = 0
3:     while(Table 1 has more rows){
4:         Read the first row X in Table 1
5:         if(X.partofspeech == field){
6:             L = L ++ [[X.SerialNumber, field]]
7:         }
8:         Move X to Table 2
9:     }
10:    return(field)
11: End BuildList
12: L1 = BuildList("Pronoun")
13: L2 = BuildList("Verb")
```

Options :

6406532306349. ✓ Line 2

6406532306350. ✗ Line 3

6406532306351.

* Line 4

6406532306352. * Line 5

6406532306353. ✓ Line 10

6406532306354. * Line 12

Sub-Section Number :	8
Sub-Section Id :	640653100789
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 16 Question Id : 640653689408 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Statement

Let **X** be a row from the "**Words**" table. Consider the following procedure.

```
Procedure CheckVowels(X)
    vDict = {}
    i = 1
    while(i <= X.LetterCount){
        A = ith letter in X.Word
        if(A is a vowel){
            vDict[A] = True
        }
        i = i + 1
    }
    if(length(keys(vDict)) >= 3){
        return(True)
    }
    return(False)
End CheckVowels
```

The return value of **CheckVowels(Y)** will be False if

Options :

6406532306372. ✓ **Y.Word** = "perseverance"

6406532306373. ✖ **Y.Word** = "determination"

6406532306374. ✓ **Y.Word** = "diligence"

6406532306375. ✖ **Y.Word** = "online"

Maths1

Section Id :	64065348500
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	13
Number of Questions to be attempted :	13
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100790
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 17 Question Id : 640653689409 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : MATHEMATICS FOR DATA SCIENCE I (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406532306376. ✓ YES

6406532306377. ✗ NO

Question Number : 18 Question Id : 640653689410 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

Instructions:

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

Options :

6406532306378. ✓ Useful Data has been mentioned above.

6406532306379. ✗ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :	2
Sub-Section Id :	640653100791
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653689411 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (19 to 20)

Question Label : Comprehension

Consider two functions $f(x) = \log_2(\log_2(\log_3 x))$ and $g(x) = -x^2 + 4x + 77$.

Let $h(x)$ be a function defined as $h(x) := (f \circ g)(x)$ in its domain,

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 19 Question Id : 640653689412 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Find the maximum value of $g(x)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

81

Question Number : 20 Question Id : 640653689413 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Find the maximum value of $h(x)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Id : 640653689422 Question Type : COMPREHENSION Sub Question Shuffling

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (21 to 22)

Question Label : Comprehension

Answer the given subquestions.

Sub questions

Question Number : 21 Question Id : 640653689423 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Find the following limit.

Let $f(2) = 10$ and $f'(2) = 4$.

Then, calculate the value of

$$\lim_{x \rightarrow 2} \frac{xf(2) - 2f(x)}{x - 2}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 22 **Question Id :** 640653689424 **Question Type :** SA **Calculator :** None

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

Correct Marks : 2

Question Label : Short Answer Question

Find the following limit.

$$\text{Calculate, } \lim_{x \rightarrow 9} \frac{2(\sqrt{f(x)} - 3)}{\sqrt{x} - 3},$$

given that $f(9) = 9$ and

$$f'(9) = 4$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8

Sub-Section Number : 3

Sub-Section Id : 640653100792

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 23 **Question Id :** 640653689414 **Question Type :** MCQ **Is Question**

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Choose the correct option for $f(x) = \frac{1}{x-1}$.

Options :

The function $(f \circ f)(x)$ in its domain is discontinuous only at the point/points
6406532306382. ❌ $x = 1$.

The function $(f \circ f)(x)$ in its domain is discontinuous only at the point/points
6406532306383. ✓ $x = 1$ and $x = 2$.

The function $(f \circ f)(x)$ in its domain is discontinuous only at point/points
6406532306384. ❌ $x = 2$.

The function $(f \circ f)(x)$ in its domain is discontinuous only at point/points
6406532306385. ❌ $x = 1, x = 2$ and $x = 3$.

Question Number : 24 Question Id : 640653689415 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Choose the set of **INCORRECT** options.

Options :

If a function is continuous at a particular point, then the function is differentiable
6406532306386. ✓ at that point.

If a function is differentiable at a particular point, then the function must be
6406532306387. ❌ continuous at that point.

6406532306388. ✳ If $f(x)$ and $g(x)$ are bijective functions, then $gof(x)$ is also a bijective function.

6406532306389. ✳ If $f(x)$ and $g(x)$ are one-one functions, then $gof(x)$ is also one-one function.

Sub-Section Number :	4
Sub-Section Id :	640653100793
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653689416 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (25 to 26)

Question Label : Comprehension

Answer the given subquestions.

Sub questions

Question Number : 25 Question Id : 640653689417 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

Find the number of solutions of
the equation $e^{3x} - 4e^{2x} + 3e^x = 0$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 26 Question Id : 640653689418 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Find the value of x that satisfies the equation $9^x - 2 \times 3^{x+1} - 27 = 0$.

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 : 640653100794

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689419 Question Type : COMPREHENSION Sub Question Shuffling

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (27 to 28)

Question Label : Comprehension

Answer the given subquestions.

Sub questions

Question Number : 27 Question Id : 640653689420 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Find the limit of the following sequence.

$$\{a_n\} \text{ such that } a_n = \frac{n^3 + 2n^2 - 1}{n^3 + 3n + 1}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 28 **Question Id :** 640653689421 **Question Type :** SA **Calculator :** None

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

Correct Marks : 3

Question Label : Short Answer Question

Find the limit of the following sequence.

$$\{a_n\} \text{ such that } a_n = \frac{n^3 + 2^n}{3^n + n^2}$$

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 : 640653100795

Question Shuffling Allowed : Yes

Is Section Default? :

null

Question Number : 29 Question Id : 640653689425 Question Type : MSQ Is Question

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

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Given a function

$$f(x) = \begin{cases} \frac{|x|}{x} & \text{if } x \neq 0 \\ 1 & \text{if } x = 0 \end{cases}$$

Which of the following options is/are true?

Options :

6406532306396. ✓ $\lim_{x \rightarrow 0^+} f(x) = f(0)$.

6406532306397. ✗ $\lim_{x \rightarrow 0^-} f(x)$ does not exist.

6406532306398. ✓ f is not continuous at $x = 0$.

6406532306399. ✗ f is differentiable at $x = 0$.

Question Number : 30 Question Id : 640653689429 Question Type : MSQ Is Question

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

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

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

Options :

6406532306409. ✗ $(f \circ g)(x) = \log(2x+1)$.

6406532306410. ❌ The domain of the function $(g \circ f)(x)$ is $[-2, -1]$

6406532306411. ✓ $(g \circ f)(x) = \log(x + 3)$.

6406532306412. ✓ The domain of the function $(g \circ f)(x)$ is $(-2, \infty)$

Sub-Section Number : 7

Sub-Section Id : 640653100796

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 31 Question Id : 640653689426 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the graphs given below:

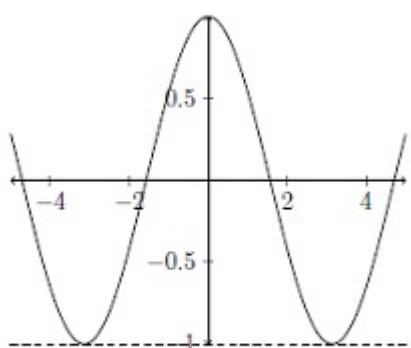


Figure: Curve 1

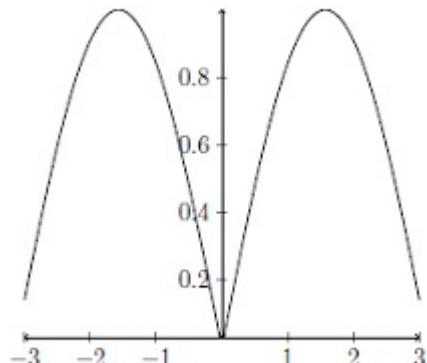


Figure: Curve 2

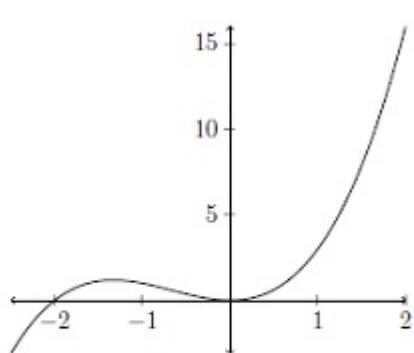


Figure: Curve 3

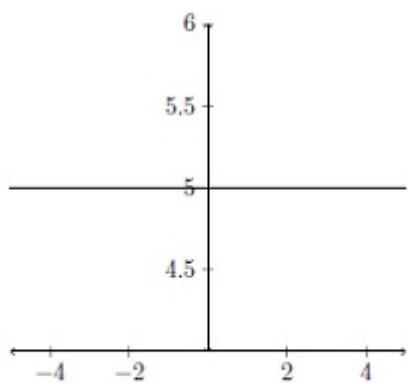


Figure: Curve 4

Choose the set of correct options:

Options :

6406532306400. ✓ There are at least two points on Curve 1, where the derivatives of the function corresponding to Curve 1, are equal.

6406532306401. ✓ At the origin the derivative of the function corresponding to Curve 2 does not exist.

6406532306402. ✗ The derivative of the function corresponding to Curve 3, at the origin and at the point $(-2, 0)$ are the same.

6406532306403. ✗ The derivative of the function corresponding to Curve 4 does not exist at any point.

Sub-Section Number :

8

Sub-Section Id :

640653100797

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 32 Question Id : 640653689427 Question Type : SA Calculator : None

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

Correct Marks : 5

Question Label : Short Answer Question

Consider a function f defined as,

$$f(x) = \begin{cases} 3mx + n & x < 1, \\ 11 & x = 1, \\ 5mx - 2n & x > 1 \end{cases}$$

If f is continuous at $x = 1$, then the value of $m + n$ is

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Sub-Section Number : 9

Sub-Section Id : 640653100798

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 33 Question Id : 640653689428 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Let f be a differentiable function such that $f(4) = 6$ and $f'(4) = -2$. What is the approximated value of $f(4.2)$ using the linear approximation of f at $x = 4$?

Options :

6406532306405. ✘ 5.3

6406532306406. ✘ 5.4

6406532306407. ✘ 5.5

6406532306408. ✓ 5.6

Statistics1

Section Id :	64065348501
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	40
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100799
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 34 Question Id : 640653689430 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : STATISTICS FOR DATA SCIENCE I (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406532306413. ✓ YES

6406532306414. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653100800

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689431 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (35 to 37)

Question Label : Comprehension

Manoj and his brother Nitin have five friends each. Manoj's friends circle has 2 boys and 3 girls while Nitin's friends circle has 3 boys and 2 girls. For their parents wedding anniversary, they decide to invite 4 of their friends. To ensure equal representation, it was decided that both of them will invite two of their friends and also ensure that there are a total of 2 boys and 2 girls getting invited. Based on the given information, answer the subquestions.

Sub questions

Question Number : 35 Question Id : 640653689432 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct options from the following:

Options :

6406532306415. ✓ Selection of boys and girls will occur simultaneously.

6406532306416. ✗ Selection of boys and girls will not occur simultaneously.

6406532306417. ✗ Selection will happen with replacement.

6406532306418. ✓ Selection will happen without replacement.

Question Number : 36 Question Id : 640653689433 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct options from the following:

Options :

6406532306419. ✗ Order matters.

6406532306420. ✓ Order does not matter.

6406532306421. ✗ Permutation is used.

6406532306422. ✓ Combination is used.

Question Number : 37 Question Id : 640653689434 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Find the number of ways in which Manoj and Nitin can invite their friends.

Options :

6406532306423. ✓ 46

6406532306424. ✗ 37

6406532306425. ✗ 210

6406532306426. ✗ 40

Question Id : 640653689435 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (38 to 40)

Question Label : Comprehension

A group of 5 employees and 3 leaders want to do a group meeting. They have decided to sit around a circular table such that all leaders will sit together. Based on the given information, answer the subquestions.

Sub questions

Question Number : 38 Question Id : 640653689436 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct options from the following:

Options :

6406532306427. ✓ Selection of people will occur simultaneously.

6406532306428. ✗ Selection of people will not occur simultaneously.

6406532306429. ✗ With replacement.

6406532306430. ✓ Without replacement.

Question Number : 39 Question Id : 640653689437 Question Type : MSQ Is Question

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

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct options from the following:

Options :

6406532306431. ✓ Order matters.

6406532306432. ✗ Order does not matter.

6406532306433. ✓ Permutation is used.

6406532306434. ✗ Combination is used.

Question Number : 40 Question Id : 640653689438 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Find the number of ways in which employees can sit around a circular table such that all leaders will sit together.

Options :

6406532306435. ✓ 720

6406532306436. ✗ 120

6406532306437. ✗ 5,040

6406532306438. ✗ 2,520

Sub-Section Number : 3

Sub-Section Id : 640653100801

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 41 Question Id : 640653689439 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Kanika has to choose a t-shirt for her outfit from a collection of 6 yellow t-shirts, 2 black t-shirts and 4 blue t-shirts. If a t-shirt is chosen randomly, then what is the chance that a black or a blue t-shirt is chosen by Kanika for her outfit? Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.4 to 0.6

Sub-Section Number : 4

Sub-Section Id : 640653100802

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 42 Question Id : 640653689440 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

A fair die is rolled twice and a fair coin is tossed twice. Define events

A : A three appear on the die twice.

B : A head appear on the coin twice.

Find the value of $P(A \cap B)$.

Options :

6406532306440. ✘ $\frac{1}{6}$

6406532306441. ✘ $\frac{1}{72}$

6406532306442. ✘ $\frac{1}{12}$

6406532306443. ✓ $\frac{1}{144}$

Sub-Section Number : 5

Sub-Section Id : 640653100803

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689441 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (43 to 44)

Question Label : Comprehension

Two bags (B_1 and B_2) containing candies are placed on a table. Bag B_1 contains 7 cinnamon candies and 4 ginger candies. Bag B_2 contains 3 cinnamon candies and 8 pepper candies. The bags are arranged such that the probability of selecting bag B_1 is $1/3$ and the probability of selecting bag B_2 is $2/3$. Suman is blindfolded and asked to select a candy. She will win a colour TV if she selects a cinnamon candy.

Based on the given information, answer the subquestions

Sub questions

Question Number : 43 Question Id : 640653689442 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

What is the probability that Suman will win the colour TV?

Options :

6406532306444. ✘ $\frac{7}{33}$

6406532306445. ✘ $\frac{2}{11}$

6406532306446. ✘ $\frac{1}{2}$

6406532306447. ✓ $\frac{13}{33}$

Question Number : 44 Question Id : 640653689443 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

If she wins a colour TV, then what is the probability that candy was from bag B_1 ?

(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 :

0.51 to 0.57

Sub-Section Number :	6
Sub-Section Id :	640653100804
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 45 Question Id : 640653689444 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

Administration section of a university has started to create roll numbers for the students, following the format '23Z170' using the digits 0, 1, 2, 3, 4, 5, 6, and a capital letter at the third position. Assume no digits are repeated. Find the number of ways in which the administration section can create a unique roll number.

Options :

6406532306449. ✓ 65,520

6406532306450. ✗ 52,920

6406532306451. ✗ 56,160

6406532306452. ✗ 46,800

Sub-Section Number :	7
Sub-Section Id :	640653100805
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 46 Question Id : 640653689445 Question Type : MSQ Is Question

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

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider an experiment of rolling a fair four sided die twice where all the possible outcomes are equally likely. Define the events

$$A = \text{1st roll results in a } 1$$

$$B = \text{Sum of the two rolls is a } 7$$

$$C = \text{2nd roll results in a } 2$$

Which among the following statements are true?

Options :

6406532306453. ✓ Events A and C are independent.

6406532306454. ✗ Events A , B and C are mutually exclusive.

6406532306455. ✗ Events A , B and C are exhaustive.

6406532306456. ✓ $P(A | (B \cup C)) = \frac{1}{6}$

Sub-Section Number : 8

Sub-Section Id : 640653100806

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689446 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (47 to 48)

Question Label : Comprehension

The manufacturer of a new fitness gadget showcased the product at a high-traffic fitness expo. The following table summarizes the results for the customers who stopped to look at the innovative fitness gadget:

Reaction	Gender	
	Female	Male
Favourable	20	40
Ambivalent	5	35
Unfavourable	10	30

Table Q.1

Based on the given information, answer the subquestions

Sub questions

Question Number : 47 Question Id : 640653689447 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

What can be said about the association between the two variables "Reaction" and "Gender"?

Options :

6406532306457. ✓ The reaction to the new fitness gadget is associated with the gender of the customer.

6406532306458. ✗ The reaction to the new fitness gadget is not associated with the gender of the customer.

6406532306459. ✗ Scatter plot is the most appropriate graphical representation for the given data .

6406532306460. ✗ The correlation coefficient is close to 1.

Question Number : 48 Question Id : 640653689448 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

A person is randomly picked from this group, then what is the probability that the person is a female, given that the person's reaction is favourable to the new gadget? Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.30 to 0.36

Sub-Section Number : 9

Sub-Section Id : 640653100807

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 49 Question Id : 640653689449 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which among the following statements is/are true for a variable X ?

Options :

6406532306462. ✓ Mean and median will be same if the $SD(X) = 0$.

6406532306463. ✗ $Var(X)$ will always increase by multiplying each observations of X by a constant c .

6406532306464. ✗ Range(X) will always remain the same with the increase in the number of observations of X .

6406532306465. * Range(X) will always increase with the increase in the number of observations of X.

Maths2

Section Id :	64065348502
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	9
Number of Questions to be attempted :	9
Section Marks :	25
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100808
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 50 Question Id : 640653689450 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : MATHEMATICS FOR DATA SCIENCE II (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406532306466. ✓ YES

6406532306467. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653100809

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 51 Question Id : 640653689459 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following functions are linear transformations?

Options :

6406532306486. ✗ $T : \mathbb{R} \rightarrow \mathbb{R}$, $T(x) = 2x + 1$

6406532306487. ✓ $T : \mathbb{R}^4 \rightarrow \mathbb{R}^2$, $T(x, y, z, w) = (x + y, z + w)$

6406532306488. ✓ $T : \mathbb{R}^3 \rightarrow \mathbb{R}^3$, $T(x, y, z) = (-y, -x, 0)$

6406532306489. ✗ $T : \mathbb{R} \rightarrow \mathbb{R}^2$, $T(x) = (x + 1, x - 1)$

Question Number : 52 Question Id : 640653689460 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let T be a linear transformation from \mathbb{R}^2 to \mathbb{R}^3 . $S \subset \mathbb{R}^2$ is a line passing through the origin. Which of the following are possible?

Options :

6406532306490. ✓ $T(S)$ could be the origin in \mathbb{R}^3 .

6406532306491. ✓ $T(S)$ could be a line passing through the origin in \mathbb{R}^3 .

6406532306492. ✗ $T(S)$ could be a plane passing through the origin in \mathbb{R}^3 .

6406532306493. ✗ $T(S)$ could be \mathbb{R}^3

Sub-Section Number : 3

Sub-Section Id : 640653100810

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 53 Question Id : 640653689451 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let A and B be $n \times n$ matrices. Which of the following statement(s) is/are true?

Options :

6406532306468. ✓ If A and B are similar, then nullity of A and nullity of B are equal.

Let A and B be similar matrices. Then the homogeneous system of linear equations $Ax = 0$ has a unique solution if and only if the homogeneous system of linear equations $Bx = 0$ has a unique solution.

6406532306469. ✓

If A^k and B^k are similar for some positive integer k , then A and B

6406532306470. ✗ are similar.

If A and B are similar matrices where A is a scalar matrix, then

6406532306471. ✓ $A = B$.

Question Number : 54 Question Id : 640653689458 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let A be a $n \times n$ orthogonal matrix. Then which of the following statement(s) is/are true?

Options :

6406532306482. ✓ The rows of A form an orthonormal basis for \mathbb{R}^n .

Suppose T is the linear transformation corresponding to A , then

6406532306483. ✓ $\|Tv\| = \|v\|$ for any $v \in \mathbb{R}^n$.

The system of linear equations $Ax = b$ has a unique solution for

6406532306484. ✓ every $b \in \mathbb{R}^n$.

The rows of A form an orthogonal basis but not an orthonormal

6406532306485. ✗ basis for \mathbb{R}^n .

Sub-Section Number :

4

Sub-Section Id :

640653100811

Question Shuffling Allowed :

No

Is Section Default? :

null

Question Id : 640653689452 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (55 to 56)

Question Label : Comprehension

Let $L = \{(x, y) : y = x + 1\}$ and $L' = \{(x, x + z - 2, z) : x, z \in \mathbb{R}\}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 55 Question Id : 640653689453 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct option from the following.

Options :

The subspace associated with the affine space L is the line
6406532306472. ❌ $y = x + 1$.

The subspace associated with the affine space L is given by
6406532306473. ✓ $\{(x, x) : x \in \mathbb{R}\}$.

The subspace associated with the affine space L' is given by
6406532306474. ✓ $\{(x, y, z) : x - y + z = 0\}$

The subspace associated with the affine space L' is the
6406532306475. ❌ xz - plane.

Question Number : 56 Question Id : 640653689454 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

If the dimension of L is m and
the dimension of L' is n ,
then $m + n$ is

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Sub-Section Number : 5

Sub-Section Id : 640653100812

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689455 Question Type : COMPREHENSION Sub Question Shuffling

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (57 to 58)

Question Label : Comprehension

Let $W = \{(x, y, z) : x + 2y - z = 0\}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 57 Question Id : 640653689456 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following is a basis
 β for W ?

Options :

6406532306477. ❌ $\{(1, 0, -1), (0, 1, 2)\}$

6406532306478. ✓ $\{(1, 0, 1), (0, 1, 2)\}$

6406532306479. ❌ $\{(1, 0, 1), (0, 1, 1)\}$

6406532306480. ❌ $\{(-1, 0, -1), (0, 2, 1)\}$

Question Number : 58 Question Id : 640653689457 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

If γ is the orthonormal basis of
 W obtained from the basis β by
using the Gram Schmidt process
with respect to the usual inner
product and (a, b, c) is the projection
of $(1, 3, 1)$ onto W ,
then what is $a + b + c$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

Question Id : 640653689461 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (59 to 60)

Question Label : Comprehension

Consider the following system of linear equations:

$$x + 3y - 2z = 0$$

$$y - z = 0$$

$$x + y = 0$$

Let A be the coefficient matrix corresponding to this system.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 59 Question Id : 640653689462 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following is the nullspace of A ?

Options :

6406532306494. ✓ $\text{span}\{(-1, 1, 1)\}$

6406532306495. ✗ $\text{span}\{(1, 1, 0)\}$

6406532306496. ✗ $\text{span}\{(1, 0, 1), (0, 1, -1)\}$

6406532306497. ✗ $\text{span}\{(1, 1, 0), (0, 1, -1)\}$

Question Number : 60 Question Id : 640653689463 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Let B be a square matrix of order 3. What is the smallest value that the nullity of BA could take?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Id : 640653689464 Question Type : COMPREHENSION Sub Question Shuffling

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (61 to 62)

Question Label : Comprehension

Consider a vector space V with bases $\beta = \{v_1, v_2\}$ and $\gamma = \{v_1 + v_2, v_1 - v_2\}$.

T is a linear transformation from V to itself such that $T(v_1) = v_1 + 2v_2$

and $T(v_2) = 2v_1 - v_2$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 61 Question Id : 640653689465 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Find the matrix corresponding to T

if γ is used as the basis for both

the domain and co-domain.

Options :

6406532306499. ✓ $\begin{bmatrix} 2 & 1 \\ 1 & -2 \end{bmatrix}$

6406532306500. ✗ $\begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$

6406532306501. ✗ $\begin{bmatrix} 3 & -1 \\ 1 & 3 \end{bmatrix}$

6406532306502. ✗ $\begin{bmatrix} 1.5 & 0.5 \\ -0.5 & 1.5 \end{bmatrix}$

Question Number : 62 Question Id : 640653689466 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

Is T an isomorphism?

Options :

6406532306503. ✓ Yes

6406532306504. ✗ No

Statistics2

Section Id : 64065348503

Section Number : 5

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions :	12
Number of Questions to be attempted :	12
Section Marks :	40
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100813
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 63 Question Id : 640653689467 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

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Options :

6406532306505. ✓ YES

6406532306506. ✘ NO

Question Number : 64 Question Id : 640653689468 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

Discrete random variables:

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

Continuous random variables:

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

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

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

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

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

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

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

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

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

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

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

Useful data:

1. Use the following values of F_Z if required:

$$F_Z\left(\frac{1}{\sqrt{5}}\right) = 0.67, F_Z\left(\frac{3}{\sqrt{5}}\right) = 0.91, F_Z(3) = 0.999, F_Z\left(\frac{-2}{\sqrt{5}}\right) = 0.19,$$

$$F_Z(0.2) = 0.58, F_Z(2) = 0.98$$

Options :

6406532306507. ✓ Useful Data has been mentioned above.

6406532306508. ✗ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 640653100814

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 65 Question Id : 640653689470 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Let X be a continuous random variable with PDF

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

Find the PDF of $Y = X^3$.

Options :

$$f_Y(y) = \begin{cases} \frac{1}{3} \left(\frac{y}{4}\right)^{1/3}, & 0 < y \leq 1, \\ 0, & \text{otherwise.} \end{cases}$$

6406532306510. ❌

$$f_Y(y) = \begin{cases} \frac{4}{3} (y)^{1/3}, & 0 < y \leq 1, \\ 0, & \text{otherwise.} \end{cases}$$

6406532306511. ✓

$$f_Y(y) = \begin{cases} \frac{1}{3} (y)^{1/3}, & 0 < y \leq 1, \\ 0, & \text{otherwise.} \end{cases}$$

6406532306512. ❌

$$f_Y(y) = \begin{cases} 4 (y)^{1/3}, & 0 < y \leq 1, \\ 0, & \text{otherwise.} \end{cases}$$

6406532306513. ❌

Question Number : 66 Question Id : 640653689471 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Let $(X, Y) \sim \text{Uniform}(D)$, where $D := \{(x, y) : x + y < 3, x > 0, y > 0\}$. What is the marginal density function of $f_X(x)$?

Options :

$$f_X(x) = \begin{cases} \frac{2}{9} (3 - x), & 0 < x < 3, \\ 0, & \text{otherwise.} \end{cases}$$

6406532306514. ✓

$$f_X(x) = \begin{cases} \frac{9}{2}(3-x), & 0 < x < 3, \\ 0, & \text{otherwise.} \end{cases}$$

6406532306515. ✘

$$f_X(x) = \begin{cases} 9(3-x), & 0 < x < 3, \\ 0, & \text{otherwise.} \end{cases}$$

6406532306516. ✘

$$f_X(x) = \begin{cases} 2(3-x), & 0 < x < 3, \\ 0, & \text{otherwise.} \end{cases}$$

6406532306517. ✘

Question Number : 67 Question Id : 640653689473 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Suppose the moment generating function of a random variable X is given by

$$M_X(\lambda) = e^{2\lambda^2}$$

Let X_1, X_2, X_3, X_4 be i.i.d. samples with distribution X and Y be a random variable defined as $Y = X_1 + X_2 + X_3 + X_4$. Which of the following option is true?

Options :

6406532306519. ✘ $Y \sim \text{Normal}(0, 8)$

6406532306520. ✘ $Y \sim \text{Normal}(0, 4)$

6406532306521. ✘ $Y \sim \text{Normal}(0, 32)$

6406532306522. ✓ $Y \sim \text{Normal}(0, 16)$

Sub-Section Number :	3
Sub-Section Id :	640653100815
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 68 Question Id : 640653689469 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Suppose Manoj owns a lightbulb manufacturing company and determines that 3 out of every 75 bulbs are defective. What is the probability that he will find the first faulty bulb on the 6th one that he tested? 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 :

0.02 to 0.04

Question Number : 69 Question Id : 640653689472 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

A certain type of thread is manufactured with a mean tensile strength of 40 kilograms at a standard deviation of 5 kilograms. If the variance of the sample mean for a sample size of n_1 is 0.0625 and the variance of the sample mean for a sample size of n_2 is 0.0417, then find an approximate value for $n_2 - n_1$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

198 to 202

Sub-Section Number : 4

Sub-Section Id : 640653100816

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689474 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (70 to 71)

Question Label : Comprehension

The probability mass function of a random variable X is given as

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

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 70 Question Id : 640653689475 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Find the value of k ? 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 : 71 Question Id : 640653689476 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

What is the value of

$$P(1 < X < 4 | X > 2)?$$

Options :

6406532306524. ✘ $\frac{1}{16}$

6406532306525. ✘ $\frac{3}{4}$

6406532306526. ✓ $\frac{1}{4}$

6406532306527. ✘ $\frac{1}{2}$

Question Id : 640653689477 Question Type : COMPREHENSION Sub Question Shuffling

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (72 to 73)

Question Label : Comprehension

Let $X \sim \text{Uniform}[0, 5]$ and $g(x) = (x - 2)^2$. Define a new random variable $Y = g(X)$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 72 Question Id : 640653689478 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Find the CDF of Y .

Options :

6406532306528. ❌ $F_Y(y) = \frac{2\sqrt{y}}{5}, 0 \leq y \leq 9$

6406532306529. ❌ $F_Y(y) = \frac{\sqrt{y}}{3}, 0 \leq y \leq 9$

6406532306530. ✓ $F_Y(y) = \begin{cases} \frac{2\sqrt{y}}{5}, & 0 \leq y \leq 4 \\ \frac{2 + \sqrt{y}}{5}, & 4 < y \leq 9 \end{cases}$

6406532306531. ❌ $F_Y(y) = \begin{cases} \frac{3\sqrt{y}}{10}, & 0 \leq y \leq 4 \\ \frac{2\sqrt{y} - 1}{5}, & 4 < y \leq 9 \end{cases}$

Question Number : 73 Question Id : 640653689479 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Find $P(1 \leq Y \leq 6.25)$. Enter the answer correct to one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Question Id : 640653689480 Question Type : COMPREHENSION Sub Question Shuffling

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (74 to 75)

Question Label : Comprehension

The joint density of two continuous random variables

X and Y is given as

$$f_{XY}(x, y) = \begin{cases} e^{-(x+y)}, & 0 \leq x < \infty, 0 \leq y < \infty, \\ 0, & \text{otherwise.} \end{cases}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 74 Question Id : 640653689481 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Are X and Y independent?

Options :

6406532306533. ✓ Yes

6406532306534. * No

Question Number : 75 Question Id : 640653689482 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Find the value of $P(X < Y)$.

Enter the answer correct to
one decimal place.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Question Id : 640653689483 Question Type : COMPREHENSION Sub Question Shuffling

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (76 to 77)

Question Label : Comprehension

Let $X_1, X_2, \dots, X_n \sim$ i.i.d. $\text{Exp}(1/3)$ and $\bar{X} = \frac{X_1 + X_2 + \dots + X_n}{n}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 76 Question Id : 640653689484 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following inequalities are true w.r.t Chebyshev inequality?

Options :

6406532306536. ✓ $P(|\bar{X} - 3| \geq 0.25) \leq \frac{144}{n}$

6406532306537. ✗ $P(|\bar{X} - 3| \geq 0.5) \leq 1 - \frac{144}{n}$

6406532306538. ✓ $P(|\bar{X} - 3| \leq 0.5) \geq 1 - \frac{36}{n}$

6406532306539. ✗ $P(|\bar{X} - 3| \leq 0.25) \geq \frac{36}{n}$

Question Number : 77 Question Id : 640653689485 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Find the minimum value of n such that the sample mean lies in [2.5, 3.5] with probability more than 0.95 using the Chebyshev inequaliy.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

718 to 722

Question Id : 640653689486 Question Type : COMPREHENSION Sub Question Shuffling

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (78 to 79)

Question Label : Comprehension

In a telecom system, each data file consists of 500 bits. Due to noise, each data bit received may have an error with probability 0.1. It is assumed that bit errors occur independently.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 78 Question Id : 640653689487 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Suppose Y represents the total number of bits without an error in a certain data file. Which of the following is true?

Options :

6406532306541. ✘ $Y \sim \text{Bernoulli}(0.9)$

6406532306542. ✘ $Y \sim \text{Bernoulli}(0.1)$

6406532306543. ✓ $Y \sim \text{Binomial}(500, 0.9)$

6406532306544. ✘ $Y \sim \text{Binomial}(500, 0.1)$

Question Number : 79 Question Id : 640653689488 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Using Central limit theorem, find the approximate probability that there are more than 53 errors in a certain data file. Enter the answer correct to two decimal places.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.30 to 0.36

DBMS

Section Id : 64065348504

Section Number : 6

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 13

Number of Questions to be attempted : 13

Section Marks : 50

Display Number Panel : Yes

Group All Questions : No

Enable Mark as Answered Mark for Review and

Yes

Clear Response :

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 640653100817

Question Shuffling Allowed : No

Is Section Default? : null

Question Number : 80 Question Id : 640653689489 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : 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 :

6406532306546. ✓ YES

6406532306547. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653100818

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 81 Question Id : 640653689493 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following table:

PlayerID	PlayerName	Team	Runs
001	Virat	India	100
002	Rohit	India	100
003	Smith	Australia	70
004	Jason	England	60
005	Rohit	Bangladesh	65
006	Asif	Pakistan	50
007	Smith	Newzealand	70

Table 1: Players

Which of the following functional dependencies hold in the Players table? [MSQ]

Options :

6406532306556. ✓ $PlayerID \rightarrow PlayerName$

6406532306557. ✗ $PlayerName \rightarrow Runs$

6406532306558. ✗ $PlayerName \rightarrow Team$

6406532306559. ✗ $Runs \rightarrow PlayerID$

Sub-Section Number : 3

Sub-Section Id : 640653100819

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 82 Question Id : 640653689494 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider a relation $R(A,B,C,D,E,F,G,H)$, where each attribute is atomic and the following functional dependencies hold:

$$\mathcal{F} = \{AB \rightarrow CDE, D \rightarrow F, F \rightarrow GH, E \rightarrow AB\}$$

The highest normal form for this relation is _____

Options :

6406532306560. ✓ 2 NF

6406532306561. ✗ 1 NF

6406532306562. ✗ 3 NF

6406532306563. ✗ BCNF

Question Number : 83 Question Id : 640653689500 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider a magnetic disk with 4 platters, 2 surfaces per platter, 1024 tracks per surface, and 2048 sectors per track, with a disk capacity of 8 GB. Find the capacity of one sector.

Options :

6406532306574. ✗ 2048 bytes per sector

6406532306575. ✗ 1024 bytes per sector

6406532306576. ✓ 512 bytes per sector

6406532306577. ✗ 256 bytes per sector

Question Number : 84 Question Id : 640653689502 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider table profile shown in table 3:

Name	Salary
Data Engg	55000
Data Sci.	75000
Data Arch.	75000
App Dev	40000
JAVA Dev	30000
Programmer	60000

Table 3: profile

Choose the correct output table when the following query is executed.

```
UPDATE profile  
SET salary = salary + 5000  
WHERE name LIKE 'Data%' or 'App Dev' = 'App Dev'
```

Options :

Name	Salary
Data Engg	55000
Data Sci.	75000
Data Arch.	75000
App Dev	45000
JAVA Dev	30000
Programmer	60000

6406532306582. *

Name	Salary
Data Engg	55000
Data Sci.	75000
Data Arch.	75000
App Dev	40000
JAVA Dev	30000
Programmer	60000

6406532306583. *

Name	Salary
Data Engg	60000
Data Sci.	80000
Data Arch.	80000
App Dev	45000
JAVA Dev	35000
Programmer	65000

6406532306584. ✓

Name	Salary
Data Engg	60000
Data Sci.	80000
Data Arch.	80000
App Dev	45000
JAVA Dev	30000
Programmer	60000

6406532306585. *

Sub-Section Number : 4

Sub-Section Id : 640653100820

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 85 Question Id : 640653689501 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the table **instructor** in the university database as shown in Table 2.

id	name	dept_name	salary
10101	Srinivasan	Comp. Sci.	60000
12121	Wu	Finance	70000
15151	Mozart	Music	60000
32343	El Said	History	50000
33456	Gold	Physics	47000
76766	Crick	Biology	32000
98345	Kim	Elec. Eng.	20000

Table 2: **instructor**

Based on the given **instructor** table, what will be the output of the Python code given below?

```
import psycopg2
def connectDb(dbname, username, pwd, address, portnum):
    try:
        connection = psycopg2.connect(database = dbname,
                                      user = username,
                                      password = pwd,
                                      host = address,
                                      port = portnum)
        cursor = connection.cursor()
        query = '''SELECT id FROM instructor a WHERE
        (SELECT COUNT(salary) FROM instructor b WHERE
        b.salary>a.salary) < 2'''
        cursor.execute(query)
        result = cursor.fetchall()
        for row in result:
            d=row[0]
            print(d)

        cursor.close()

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

Options :

10101
12121
15151

6406532306578. ✓

6406532306579. ❌

76766
98345

10101
12121

6406532306580. *

6406532306581. * None of these

Question Number : 86 Question Id : 640653689506 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

The G20 is a global forum that brings together the world's major economies to discuss and cooperate on international economic and financial issues. The organizers of the G20 event have designed a database to store information about the participants, their countries, and the issues discussed.

The original database is

G20Participants (*Participant_ID, Participant_Name, Participant_Email, Participant_Country, Country_Leader_Name, Country_GDP, Issue_Discussed*)

The functional dependencies are:

$F = \{Participant_ID \rightarrow Participant_Name, Participant_Email$
 $Participant_Country \rightarrow Country_Leader_Name, Country_GDP$
 $Participant_ID \rightarrow Participant_Country\}$

The initial design of the database is as follows:

Table 1:

Participants (*Participant_ID, Participant_Name, Participant_Email*)

Table 2:

Country (*Participant_Country, Country_Leader_Name, Country_GDP, Issue_Discussed*)

The database designers have identified that this design violates the third normal form (3NF) of database normalization.

Which of the following changes would bring the database design into 3NF?

Options :

6406532306594. ❌ Split the **Country** table into two tables, one for the issue discussed and merge with **Participants**.

6406532306595. ❌ Remove *Issue_Discussed* and add *Participant_ID* in **Country** table. And create a new table for the issues discussed and link it to the **Participants**.

6406532306596. ❌ Remove *Issue_Discussed* from **Country** and create a new table for the issues discussed and link it to the **Participants** tables using a foreign key.

6406532306597. ✓ Remove *Issue_Discussed* from **Country** and create a new table for the issues discussed and link it to the **Participants** and **Country** tables using a foreign key.

Sub-Section Number : 5

Sub-Section Id : 640653100821

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 87 Question Id : 640653689507 Question Type : MSQ Is Question

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

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the relation players(Name, Team, Coach, Runs) with the data:

Name	Team	Coach	Runs
Sharma	CSK	Steven	99
Sharma	MI	Mahela	50
Sharma	MI	Mahela	99
Sharma	CSK	Steven	50
Kumar	CSK	Steven	49
Kumar	MI	Mahela	100
Kumar	MI	Mahela	49
Kumar	CSK	Steven	100

Table 4: players

Check whether the relation players is in 4NF or not. If not, then decomposed it into 4NF.

Choose the correct option.

Options :

6406532306598. ✘ The relation players is in 4NF.

Name	Runs
Sharma	99
Sharma	50
Kumar	49
Kumar	100

Table 5: players1

6406532306599. ✓

Name	Team	Coach
Sharma	CSK	Steven
Sharma	MI	Mahela
Kumar	CSK	Steven
Kumar	MI	Mahela

Table 6: players2

Name	Team	Runs
Sharma	CSK	99
Sharma	MI	50
Kumar	CSK	49
Kumar	MI	100

6406532306600. ✘ Table 7: players1

Team	Coach
CSK	Steven
MI	Mahela

Table 8: players2

6406532306601. ✘

Name	Team	Runs
Sharma	CSK	99
Sharma	MI	50
Kumar	CSK	49
Kumar	MI	100

Table 9: players1

Name	Coach	Runs
Sharma	Steven	99
Sharma	Mahela	50
Kumar	Steven	49
Kumar	Mahela	100

Table 10: players2

Sub-Section Number :

6

Sub-Section Id :

640653100822

Question Shuffling Allowed :

No

Is Section Default? :

null

Question Id : 640653689490 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (88 to 89)

Question Label : Comprehension

Consider the relation schema and the set of functional dependencies, and answer the sub questions.

$$\begin{aligned} R(A, B, C, D, E, F, G) \\ \mathcal{F} = \{A \rightarrow B, C \rightarrow E, D \rightarrow EF, B \rightarrow D, F \rightarrow G\} \end{aligned}$$

Sub questions

Question Number : 88 Question Id : 640653689491 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

What is the total number of superkeys present in relation R?

Options :

6406532306549. ✓ 32

6406532306550. ✗ 29

6406532306551. ✗ 33

Question Number : 89 Question Id : 640653689492 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the relation **R** to be decomposed into the following decompositions:

$$D_1 = (A, B), (A, C, D, E), (E, F, G)$$
$$D_2 = (A, B, C, D, E), (D, E, F), (F, G)$$

Choose the correct option(s).

Options :

6406532306552. ✗ D_1 is lossy but dependency preserving

6406532306553. ✗ D_2 is lossless but not dependency preserving

6406532306554. ✓ D_1 is lossy but not dependency preserving

6406532306555. ✓ D_2 is lossless but dependency preserving

Question Id : 640653689495 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (90 to 91)

Question Label : Comprehension

The Indian Space Research Organization (ISRO) has decided to maintain a database of all the employees and projects that come under the Chandrayaan mission. Below is the original database structure designed by ISRO:

Chandrayaan(*Emp_ID, Scientist_Name, Technician_Name, Project_ID, Project_Name, Budget*)

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

$F = \{Emp_ID \rightarrow Scientist_Name, Technician_Name,$
 $Project_ID \rightarrow Project_Name,$
 $Project_Name \rightarrow Budget\}$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 90 Question Id : 640653689496 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

The current table is in which normal form?

Options :

6406532306564. ✓ 1 NF

6406532306565. ✗ 2 NF

6406532306566. ✗ 3 NF

6406532306567. ✗ BCNF

Question Number : 91 Question Id : 640653689497 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

Which of the following decompositions will help to achieve BCNF?

Options :

- Table 1: Scientists (*Emp_ID, Scientist_Name*)
- Table 2: Technicians (*Emp_ID, Technician_Name*)
- Table 3: Projects (*Project_ID, Project_Name*)
- Table 4: Finances (*Project_Name, Budget*)

6406532306568. ✓

- Table 1: Scientists (*Emp_ID, Scientist_Name, Project_ID*)

- Table 2: Technicians (*Emp_ID, Technician_Name*)

6406532306569. ✗

- Table 3: Projects (*Project_ID, Project_Name, Budget*)

6406532306570. ✗

- Table 1: Scientists (*Emp_ID, Scientist_Name*)

- Table 2: Technicians (*Emp_ID, Technician_Name, Project_Name, Budget*)

- Table 3: Projects (*Project_ID, Project_Name*)

6406532306571. ✗

- Table 1: Scientists (*Emp_ID, Scientist_Name*)

- Table 2: Technicians (*Emp_ID, Technician_Name*)

- Table 3: Projects (*Project_ID, Project_Name, Budget*)

- Table 4: Finances (*Project_Name, Budget*)

Sub-Section Number :

7

Sub-Section Id :

640653100823

Question Shuffling Allowed :

No

Is Section Default? :

null

Question Id : 640653689503 Question Type : COMPREHENSION Sub Question Shuffling

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (92 to 93)

Question Label : Comprehension

Consider the relation **CAR**(*LicenseNo*, *EngineSerialNo*, *Model*, *Year*) and the following functional dependencies set

$$\mathcal{F} = \{ \text{LicenseNo}, \text{EngineSerialNo} \rightarrow \text{Model}, \\ \text{EngineSerialNo} \rightarrow \text{Year} \\ \text{Model}, \text{Year} \rightarrow \text{EngineSerialNo} \}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 92 Question Id : 640653689504 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are candidate keys for relation **CAR**?

Options :

6406532306586. ✓ (LicenseNo, EngineSerialNo)

6406532306587. ✗ (LicenseNo, EngineSerialNo, Year)

6406532306588. ✓ (LicenseNo, Model, Year)

6406532306589. ✗ (LicenseNo)

Question Number : 93 Question Id : 640653689505 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

If the relation **CAR** is decomposed into two relations **C1** and **C2**, which of the following is a lossless join decomposition?

Options :

6406532306590. ✗ **C1**(*LicenseNo*, *EngineSerialNo*, *Model*), **C2**(*Model*, *Year*)

6406532306591. ✓ **C1**(*LicenseNo, EngineSerialNo, Model*), **C2**(*EngineSerialNo, Year*)

6406532306592. ✖ **C1**(*LicenseNo, EngineSerialNo*), **C2**(*Model, Year*)

6406532306593. ✖ **C1**(*LicenseNo, EngineSerialNo, Year*), **C2**(*LicenseNo, Year*)

Sub-Section Number : 8

Sub-Section Id : 640653100824

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 94 Question Id : 640653689498 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

Consider a string of pending block references in the order given: 4, 6, 4, 1, 3, 2, 4, 1, 4, 2. The system has a buffer with 4 slots. Assume that initially, the buffer is empty. If LRU buffer replacement policy is used, then what will be the value of the following expression?

Number of misses – Number of hits

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Sub-Section Number : 9

Sub-Section Id : 640653100825

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 95 Question Id : 640653689499 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

Consider a binary search tree consisting of 15 elements. Let m be the maximum height possible for a given binary search tree, and n be the minimum height possible for a given binary search tree.

What will be the value of $m - n$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

11

PDSA

Section Id : 64065348505

Section Number : 7

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 17

Number of Questions to be attempted : 17

Section Marks : 50

Display Number Panel : Yes

Group All Questions : No

Enable Mark as Answered Mark for Review and

Clear Response : Yes

Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100826
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 96 Question Id : 640653689508 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : PROGRAMMING, DATA STRUCTURES AND ALGORITHMS USING PYTHON (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406532306602. ✓ YES

6406532306603. ✗ NO

Sub-Section Number :	2
Sub-Section Id :	640653100827
Question Shuffling Allowed :	Yes
Is Section Default? :	null

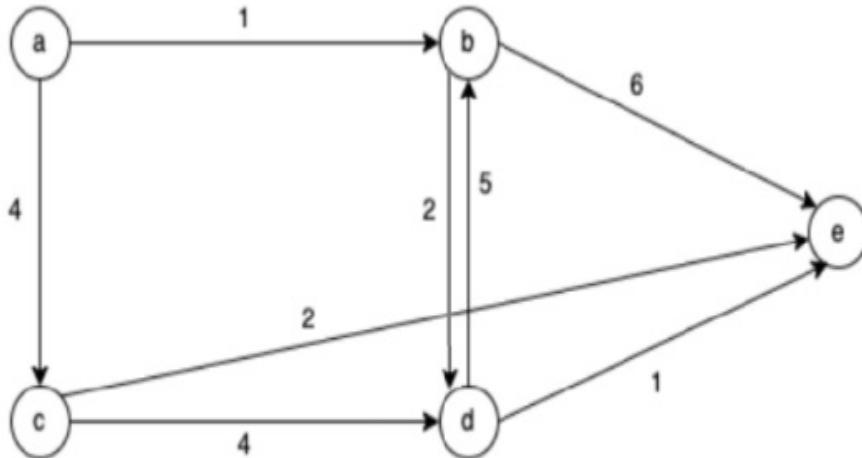
Question Number : 97 Question Id : 640653689509 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following directed graph.



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

Note: Assume that when multiple unvisited nodes have the same minimum distance, Dijkstra's algorithm visits them alphabetically.

Options :

6406532306604. ✘ a, b, c, d, e

6406532306605. ✘ a, b, c, e, d

6406532306606. ✓ a, b, d, c, e

6406532306607. ✘ a, b, d, e, c

Question Number : 98 Question Id : 640653689512 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

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

1. The edge e must belong to each path from s to t .
2. The edge e must belong to the minimum cost spanning tree of G .

Options :

6406532306614. ✘ Only 1

6406532306615. ✓ Only 2

6406532306616. ✘ Both 1 and 2

6406532306617. ✘ Neither 1 nor 2

Question Number : 99 Question Id : 640653689514 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider a min-heap represented as the following list:

[3, 6, 27, 65, 45, 33, 29, 72].

What would be the resultant min-heap after the following operations are done on it?

1. delete_min()
2. Insert(10)
3. Insert(5)

Options :

6406532306622. ✘ [5, 6, 27, 10, 72, 29, 33, 65, 45]

6406532306623. ✘ [5, 6, 27, 10, 72, 33, 29, 45, 65]

6406532306624. ✘ [5, 6, 27, 72, 10, 33, 29, 45, 65]

6406532306625. ✓ [5, 6, 27, 10, 72, 33, 29, 65, 45]

Question Number : 100 Question Id : 640653689516 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following class for nodes in BST.

```
1 class Node:  
2     def __init__(self, value = None):  
3         self.data = value  
4         self.left = None  
5         self.right = None
```

You are given a binary search tree where each node is created by the given class `Node` and, the `root` contains the reference to the root node of the BST. Which of the following implementations is suitable to print the node's data in **descending order**?

Options :

```
1 def traverse(root):  
2     if root is None:  
3         return  
4     traverse(root.left)  
5     traverse(root.right)  
6     print(root.data, end=' ')
```

6406532306630. ❌

```
1 def traverse(root):  
2     if root is None:  
3         return  
4     traverse(root.right)  
5     traverse(root.left)  
6     print(root.data, end=' ')
```

6406532306631. ❌

```
1 def traverse(root):  
2     if root is None:  
3         return  
4     traverse(root.left)  
5     print(root.data, end=' ')\n6     traverse(root.right)
```

6406532306632. ❌

```
1 def traverse(root):  
2     if root is None:  
3         return  
4     traverse(root.right)  
5     print(root.data, end=' ')\n6     traverse(root.left)
```

6406532306633. ✓

Question Number : 101 Question Id : 640653689518 Question Type : MCQ Is Question

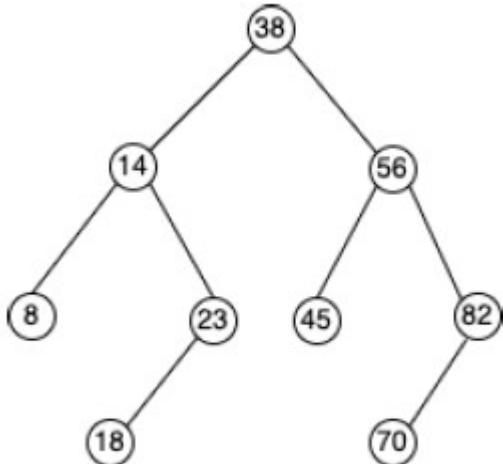
Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Correct Marks : 3

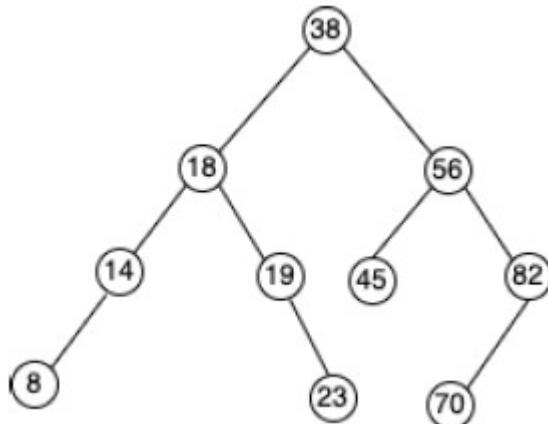
Question Label : Multiple Choice Question

Consider the below AVL tree.



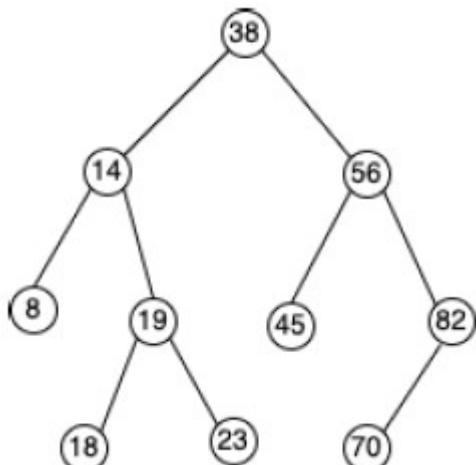
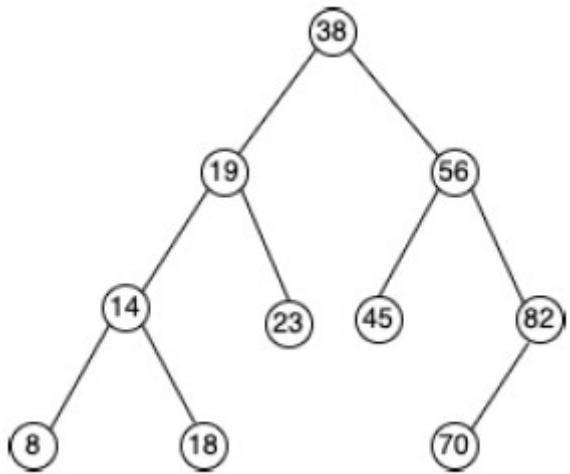
What is the updated AVL tree after inserting 19 in the given AVL tree?

Options :



6406532306635. *

6406532306636. *



6406532306637. ✓

6406532306638. ✗ None of these

Question Number : 102 Question Id : 640653689519 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Given the following set of characters and their frequencies:

Character	Frequency
A	80
B	60
C	50
D	40
E	30
F	20

Using Huffman coding, construct the Huffman tree for this set of characters. What is the total number of bits needed to represent the message ABCDEF?

Options :

6406532306639. ✘ 15 bits

6406532306640. ✘ 16 bits

6406532306641. ✓ 17 bits

6406532306642. ✘ 18 bits

Question Number : 103 Question Id : 640653689520 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Suppose you have a set of jobs with their start and end times. If any job finishes at a time T , then the other job can be scheduled at a time T or afterward. Your goal is to find the maximum number of non-overlapping jobs that can be scheduled.

Which of the following greedy strategy can be used to solve this problem optimally?

Options :

6406532306643. ✘ Select jobs with the earliest start times first.

6406532306644. ✓ Select jobs with the earliest end times first.

6406532306645. ✘ Select jobs with the shortest duration first.

6406532306646. ✘ Select jobs with the longest duration first.

Question Number : 104 Question Id : 640653689523 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following function to return the minimum element in the list `L` of size `n`.

```
1 def find_min(L, low, high):
2     if low == high:
3         return L[low]
4     mid = (low + high) // 2
5     min1 = find_min(L, low, mid)
6     min2 = find_min(L, mid + 1, high)
7     return min(min1, min2)
```

Which of the following represents the correct recurrence relation for the given function `find_min`?

Options :

6406532306652. ✘ $T(n) = T(n/2) + n$

6406532306653. ✓ $T(n) = 2T(n/2) + 1$

6406532306654. ✘ $T(n) = 2T(n/2) + n$

6406532306655. ✘ $T(n) = T(n/2) + 1$

Question Number : 105 Question Id : 640653689524 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following recurrences.

1. $T_1(n) = 3T_1(n/3) + O(n^2)$

2. $T_2(n) = 9T_2(n/3) + O(n)$

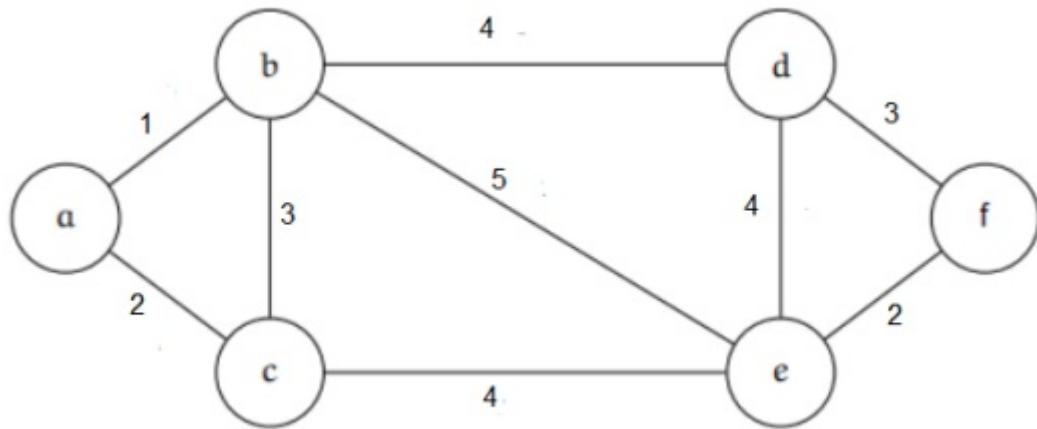
Base Case:- $T_1(1) = T_2(1) = 1$

Select the correct complexity for given recurrences.

Options :6406532306656. ✓ $T_1 = O(n^2)$ and $T_2 = O(n^2)$ 6406532306657. ✘ $T_1 = O(n \log n)$ and $T_2 = O(n^2)$ 6406532306658. ✘ $T_1 = O(n \log n)$ and $T_2 = O(n^2 \log n)$ 6406532306659. ✘ $T_1 = O(n^2)$ and $T_2 = O(n \log n)$ **Sub-Section Number :** 3**Sub-Section Id :** 640653100828**Question Shuffling Allowed :** Yes**Is Section Default? :** null**Question Number : 106 Question Id : 640653689511 Question Type : SA Calculator : None****Response Time : N.A Think Time : N.A Minimum Instruction Time : 0****Correct Marks : 4**

Question Label : Short Answer Question

Consider the graph G given below.



The cost of the minimum cost spanning tree for the given graph is _____ .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

12

Question Number : 107 **Question Id :** 640653689521 **Question Type :** SA **Calculator :** None

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

Correct Marks : 4

Question Label : Short Answer Question

In a list L , two elements $L[i]$ and $L[j]$ form an **inversion** if $L[i] > L[j]$ and $i < j$.

What is the number of inversion pairs for the list $L = [1, 5, 4, 2, 6, 3]$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Sub-Section Number :

Sub-Section Id : 640653100829

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 108 Question Id : 640653689517 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

What is the maximum possible height of an AVL tree containing **15** nodes? Consider that an AVL tree with a single node has a height of 1.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Sub-Section Number : 5

Sub-Section Id : 640653100830

Question Shuffling Allowed : Yes

Is Section Default? : null

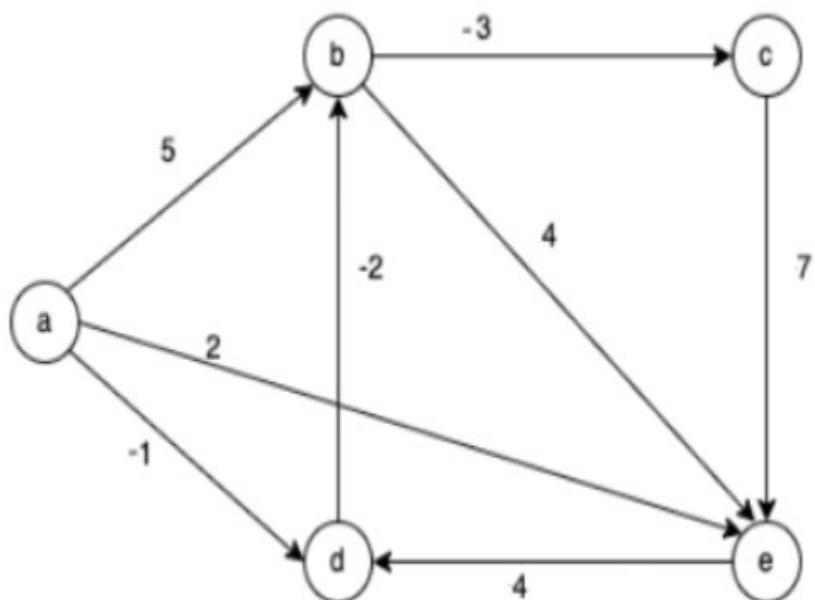
Question Number : 109 Question Id : 640653689510 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following graph.



Which of the following statement(s) is/are **true** about computing the shortest path distance from vertex **a** to other vertices in the given graph?

Options :

6406532306608. ✓ Dijkstra's algorithm computes the correct shortest path distance.

6406532306609. ✗ Dijkstra's algorithm does not compute the correct shortest path distance.

6406532306610. ✓ Bellman-Ford algorithm computes the correct shortest path distance.

6406532306611. ✗ Bellman-Ford algorithm does not compute the correct shortest path distance.

6406532306612. ✓ Floyd Warshall algorithm computes the correct shortest path distance.

Question Number : 110 Question Id : 640653689513 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are **true** about min-heap with distinct elements?

Options :

6406532306618. ✓ The largest element in a min-heap is always at a leaf node.

6406532306619. ✗ The largest element in a min-heap is always at the lowest level.

6406532306620. ✓ The second-smallest element in a min-heap is always a child of the root node.

6406532306621. ✗ Finding the largest element in min-heap takes $O(\log n)$ time.

Question Number : 111 Question Id : 640653689515 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

A binary search tree is used to locate the number 43. Which of the following probe sequences of compared elements from the root to 43 is/are not possible?

Options :

6406532306626. ✓ 2, 3, 50, 40, 60, 43

6406532306627. ✗ 61, 52, 14, 17, 40, 43

6406532306628. ✗ 10, 65, 31, 48, 37, 43

6406532306629. ✓ 17, 77, 27, 66, 18, 43

Question Number : 112 Question Id : 640653689522 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following statements and choose the correct ones.

Options :

6406532306648. ✓ The worst case running time of the Quick select algorithm to find the k-th largest number is $O(n^2)$

6406532306649. ✓ The time taken to find the median in an unsorted list using the Median of Medians (MoM) algorithm is $O(n)$

6406532306650. ✓ Quick select algorithm is an example of the divide-and-conquer approach to solving problems

6406532306651. ❌ Using Fast Select (Quick Select using MoM for pivot selection) strategy, the worst-case running time will be $O(n \log n)$.

AppDev1

Section Id :	64065348506
Section Number :	8
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	15
Number of Questions to be attempted :	15
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100831
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 113 Question Id : 640653689525 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MODERN APPLICATION DEVELOPMENT I (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406532306660. ✓ YES

6406532306661. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653100832

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 114 Question Id : 640653689526 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the schema for the 'student' table created in SQLite database using flask-sqlalchemy.

```
CREATE TABLE "student" (
    "s_id"      INTEGER,
    "roll_number" TEXT NOT NULL UNIQUE,
    "first_name"  TEXT NOT NULL,
    "last_name"   TEXT NOT NULL,
    PRIMARY KEY("s_id" AUTOINCREMENT)
);
```

What will be the output of the flask_sqlalchemy command given below?

```
>>> s1 = Student(roll_number = "M01", first_name = "John", last_name = "Doe")
>>> db.session.add(s1)
>>> s2 = Student(roll_number = "M02", first_name = "John", last_name = "Luther")
>>> db.session.add(s2)
>>> s3 = Student(roll_number = "M03", first_name = "Harry", last_name = "Doe")
>>> db.session.add(s3)
>>> db.session.commit()
>>> user1= Student.query.filter_by(first_name="John").first()
>>> user1.first_name= "Harry"
>>> user1.last_name= "Luther"
>>> db.session.commit()
>>> s1 = Student.query.all()
>>> for student in s1:
...     print(student.first_name)
...     print(student.last_name)
...
...
```

Options :

Harry
Luther
Harry
Luther
Harry

6406532306662. ❌ Doe

Harry
Luther
John
Luther
Harry
Doe

6406532306663. ✓ Doe

6406532306664.

Harry
Luther
Harry
Doe
Harry
* Doe

Harry
Doe
John
Luther
Harry
Doe

6406532306665. *

Question Number : 115 Question Id : 640653689543 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following flask application.

```

from flask import Flask, abort
app = Flask(__name__)

users = ["admin", "user_1", "user_2", "user_3"]

@app.route('/home/<string:username>', methods = ['POST'])
def home(username):
    if username in users:
        return f"<h1>Hello {username}, Welcome!</h1>"
    else:
        abort(404)

@app.errorhandler(404)
def user_error_1(error):
    return "<h1>The user you are looking for is invalid.</h1>"

@app.errorhandler(405)
def user_error_2(error):
    return "<h1>Please check the web request.</h1>"

app.run()

```

If the application is running locally on `http://127.0.0.1:5000`. What will be rendered on the browser for url `http://127.0.0.1:5000/home/user_4` ?

Options :

6406532306722. ✖ **Hello user_4, Welcome!**

6406532306723. ✖ **The user you are looking for is invalid.**

6406532306724. ✖ **Not Found**

6406532306725. ✓ **Please check the web request**

Sub-Section Number : 3

Sub-Section Id : 640653100833

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 116 Question Id : 640653689527 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following flask app. Given that `test_request_context()` allows text to be printed on the terminal, which of the following statements is/are correct?

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

@app.route('/home')
def index():
    return 'Mad-I Student Data'

@app.route('/student/<student_name>/<int:student_id>')
def profile(student_name,student_id):
    return f'Student Name:{student_name},Student ID:{student_id}'

with app.test_request_context():
    #== print statement ==#
```

Options :

If #== print statement ==# is replaced by;
print(url_for('index')),
the output on the terminal will be;

6406532306666. ✘ Mad-I Student Data

If #== print statement ==# is replaced by;
print(url_for('profile', student_name='John', student_id= 101)),
the output on the terminal will be;

6406532306667. ✘ /student?student_name=John&student_id=101

If #== print statement ==# is replaced by;
print(url_for('index')),
the output on the terminal will be;

6406532306668. ✓ /home

6406532306669.

If `#== print statement ==#` is replaced by:
print(url_for('profile', student_name='John', student_id=101)),
the output on the terminal will be;
✓ /student/John/101

**Question Number : 117 Question Id : 640653689529 Question Type : MSQ Is Question
Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following flask application.

app.py

```
from flask import Flask, abort

app = Flask(__name__)

@app.route('/<uname>')
def index(uname):
    if uname[0].isdigit():
        abort(400, "Bad Request")
    return '<h1>Good Username</h1>'

app.run(debug=True)
```

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

Options :

For URL <http://127.0.0.1:5000/MAD1?uname=102> the browser will render 6406532306674. ✘ Bad Request.

For URL <http://127.0.0.1:5000/MAD1?uname=102> the browser will render 6406532306675. ✓ **Good Username.**

For URL <http://127.0.0.1:5000/102?uname=MAD1> the browser will render 6406532306676. ✓ Bad Request.

For URL <http://127.0.0.1:5000/102?uname=MAD1> the browser will render
6406532306677. ✘ Good Username.

Sub-Section Number :	4
Sub-Section Id :	640653100834
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 118 Question Id : 640653689528 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

In the context of in-memory databases, what is the primary function of an index?

Options :

6406532306670. ✘ To encrypt sensitive data

6406532306671. ✓ To optimize query performance by speeding up data retrieval

6406532306672. ✘ To manage data replication

6406532306673. ✘ To store metadata about the database structure

Question Number : 119 Question Id : 640653689536 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following python code snippet.

```
from string import Template as T1
from jinja2 import Template as T2
temp = "A student needs to complete $c1 level to get to the {{c2}}
level."
temp = T1(temp)
out = temp.substitute({'c1':'foundation', 'c2':'diploma'})
print(out)
out= T2(out)
print(out.render({'c2':'diploma'}))
```

What is the generated output on python console?

Options :

6406532306694. ✖ A student needs to complete foundation level to get to the diploma level.
A student needs to complete foundation level to get to the diploma level.

6406532306695. ✖ A student needs to complete \$c1 level to get to the {{c2}} level.
A student needs to complete foundation level to get to the diploma level.

6406532306696. ✓ A student needs to complete foundation level to get to the {{c2}} level.
A student needs to complete foundation level to get to the diploma level.

6406532306697. ✖ A student needs to complete foundation level to get to the {{diploma}} level.
A student needs to complete foundation level to get to the diploma level.

Question Number : 120 Question Id : 640653689538 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

In the context of API documentation, what is typically provided to describe the available endpoints, request parameters and response formats?

Options :

6406532306702. ✓ API documentation or API reference

6406532306703. ✖ API key

6406532306704. ❖ Software source code

6406532306705. ❖ OAuth tokens

Sub-Section Number :	5
Sub-Section Id :	640653100835
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653689530 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (121 to 122)

Question Label : Comprehension

Consider the models "Channel" and "Video" used to create the tables "channel" and "video" in SQLite database using flask-sqlalchemy and answer the given subquestions.

```
class Channel(db.Model):
    id = db.Column(db.Integer, primary_key = True)
    name = db.Column(db.String(50), unique = True, nullable = False)
    videos = db.relationship("Video", backref = "playlist")

class Video(db.Model):
    id = db.Column(db.Integer, primary_key = True)
    name = db.Column(db.String(50), unique = True, nullable = False)
    channel = db.Column(db.Integer, db.ForeignKey("channel.id"))
```

Sub questions

Question Number : 121 Question Id : 640653689531 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

What relationship do the tables "channel" and "video" share.

Options :

6406532306678. ❌ One-to-one

6406532306679. ✓ One-to-many

6406532306680. ❌ Many-to-one

6406532306681. ❌ Many-to-many

Question Number : 122 Question Id : 640653689532 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

If "ch1" is a channel object created in
"channel" table with primary key 1, then the
correct way(s) of creating a video object
"vid1" in the video table that belongs to
"ch1" object is/are _____. (let
"name" of the video be "Intro to Python")

Options :

```
>>> vid1 = Video(name = "Intro to Python", channel = ch1)
>>> db.session.add(vid1)
```

6406532306682. ❌ >>> db.session.commit()

```
>>> vid1 = Video(name = "Intro to Python", channel = 1)
>>> db.session.add(vid1)
```

6406532306683. ✓ >>> db.session.commit()

```
>>> vid1 = Video(name = "Intro to Python", playlist = ch1)
>>> db.session.add(vid1)
```

6406532306684. ✓ >>> db.session.commit()

```
>>> vid1 = Video(name = "Intro to Python", playlist = 1)
>>> db.session.add(vid1)
```

6406532306685. ❌ >>> db.session.commit()

Sub-Section Number : 6
Sub-Section Id : 640653100836
Question Shuffling Allowed : No
Is Section Default? : null

Question Id : 640653689533 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (123 to 124)

Question Label : Comprehension

Consider the following flask application running locally on <http://127.0.0.1:5000> and the table "student" in the database and answer the given subquestions.

id	name	roll	course
Filter	Filter	Filter	Filter
1	Sandeep	STU101	History
2	Ramesh	STU102	Physics
3	Aarav	STU103	Chemistry
4	Meera	STU104	Biotechnology
5	Ramesh	STU105	Mechanics
6	Rishav	STU106	Mathematics

Filename: app.py

```
parser = reqparse.RequestParser()
parser.add_argument('roll')
parser.add_argument('name')
parser.add_argument('course')

class TestApi(Resource):
    def get(self, name):
        stud = Student.query.filter_by(name = name).first()
        return {
            "roll_no": stud.roll
        }

    def post(self):
        stud = parser.parse_args()
        newStud = Student(roll = stud['roll'], name = stud['name'],
                          course = stud['course'])
        db.session.add(newStud)
        db.session.commit()
        return '', 201

    def put(self, roll, course):
        stud = Student.query.filter_by(roll = roll).first()
        stud.course = course
        db.session.commit()
        return ''

api.add_resource(TestApi,
                  "/api/<name>",
                  "/student/",
                  "/app/<roll>/<course>")
```

Sub questions

Question Number : 123 **Question Id :** 640653689534 **Question Type :** MCQ **Is Question**

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

Correct Marks : 3

Question Label : Multiple Choice Question

Map the api resources in column A with the correct URLs given in column B.

Column A	Column B
1. GET	a. http://127.0.0.1:5000/student
2. PUT	b. http://127.0.0.1:5000/api/Meera
3. POST	c. http://127.0.0.1:5000/app/STU103/Sociology

Options :

6406532306686. ✗ 1 → c, 2 → a, 3 → b

6406532306687. ✗ 1 → a, 2 → b, 3 → c

6406532306688. ✗ 1 → b, 2 → a, 3 → c

6406532306689. ✓ 1 → b, 2 → c, 3 → a

Question Number : 124 Question Id : 640653689535 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

If the app first receives the request,

```
curl http://127.0.0.1:5000/app/STU105/Robotics -X PUT
```

what will be the final output on the shell after writing the following lines of code one below the other in the Python shell?

```
>>> from app import *
>>> students = Student.query.filter_by(name = "Ramesh").all()
>>> for student in students:
...     print(student.course)
```

Options :

Physics

6406532306690. ❌ Physics

Robotics

6406532306691. ❌ Robotics

Physics

6406532306692. ✓ Robotics

Robotics

6406532306693. ❌ Physics

Sub-Section Number :

7

Sub-Section Id :

640653100837

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 125 Question Id : 640653689537 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider a client which is located 3000 km from the server makes a request through the cable. Suddenly after the request reaches the server, the cable breaks and the response is now to be sent to the client via air. This change of medium caused an additional delay of 30 ms at the server end. How long will the client have to wait for receiving the response? (speed on cable = 2×10^8 m/s and in air 3×10^8 m/s)

Options :

6406532306698. ✓ 55 milliseconds

6406532306699. ❌ 50 milliseconds

6406532306700. ❌ 80 milliseconds

6406532306701. ✘ 60 milliseconds

Question Number : 126 Question Id : 640653689539 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

The throughput of a Solid State Device (SSD) is 180 MB/sec. If it is to be replaced by a standard HDD whose lens can read data with the rate of 4.8 Megabits/revolution. What should be the speed of rotation (in RPM) of HDD to get a throughput equal to that of the SDD?

Options :

6406532306706. ✘ 300

6406532306707. ✘ 900

6406532306708. ✘ 12000

6406532306709. ✓ 18000

Question Number : 127 Question Id : 640653689542 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

What will be the output of the following Python code snippet?

```

def modify(func):
    def wrapper(n):
        mylist = []
        for i in range(1, n + 1):
            if n%i == 0:
                mylist.append(i)
        return mylist
    return wrapper

@modify
def myFunc(n):
    mylist = []
    for i in range(1, n + 1):
        if i%2 == 0:
            mylist.append(i)
    return mylist

print(myFunc(14))

```

Options :

6406532306718. ✖ [1, 3, 5, 7, 9, 11, 13]

6406532306719. ✖ [2, 4, 6, 8, 10, 12, 14]

6406532306720. ✓ [1, 2, 7, 14]

6406532306721. ✖ [1, 3, 5, 7, 11, 13]

Sub-Section Number : 8

Sub-Section Id : 640653100838

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 128 Question Id : 640653689540 Question Type : MSQ Is Question

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

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following flask view function defined to add a product and select correct statement(s).

```
@app.route("/add", methods = ['GET', 'POST'])
def add_product():
    if request.method == 'POST':
        name = request.form.get('name')
        category = request.form.get('category')
        if name == "":
            return redirect('/add')
        if category == "":
            return redirect('/add')
        return f"Product {name} is added in {category} category."
    return """
        <form action="/add" method="post">
            Product Name: <input type="text" name="name"
            minlength="2"><br>
            Product Category: <input type="text" name="category"
            required><br>
            <input type="submit" value="Add Product">
        </form>
    """
```

Options :

6406532306710. ✖ The form to add the product is statically generated.

6406532306711. ✓ The form to add the product is dynamically generated.

6406532306712. ✓ The form rendered for /add endpoint has frontend validation.

6406532306713. ✓ The form rendered for /add endpoint has backend validation.

Question Number : 129 Question Id : 640653689541 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 4.5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following Python code snippet.

Filename: log.py

```
import logging
import sys

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

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

if num2 > 0:
    logging.debug(f"Division {num1}/{num2} is possible")
else:
    logging.critical("FATAL - Division by zero is not possible")
```

Which of the following statements is/are correct?

Options :

For the command: python log.py 12 24

The output on the terminal will be:

6406532306714. ✘

DEBUG - Division 12/24 is possible

For the command: python log.py 0 24

The output on the terminal will be:

6406532306715. ✘

DEBUG - Division 0/24 is possible

For the command: python log.py 15 0

The output on the terminal will be:

6406532306716. ✓

CRITICAL - FATAL - Division by zero is not possible

For the command: python log.py 0 0

The output on the terminal will be:

6406532306717. ✓

CRITICAL - FATAL - Division by zero is not possible

MLF

Section Id :	64065348507
Section Number :	9
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	11
Number of Questions to be attempted :	11
Section Marks :	40
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100839
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 130 Question Id : 640653689544 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MACHINE LEARNING FOUNDATIONS (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406532306726. ✓ YES

6406532306727. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653100840

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 131 Question Id : 640653689545 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Let U and V be two unitary matrices. Consider the following statements:

Statement 1: $U + V$ is unitary.

Statement 2: UV is unitary.

Select the correct options from the following:

Options :

6406532306728. ✓ Only statement 2 is correct.

6406532306729. ✗ Both statement 1 and statement 2 are incorrect.

6406532306730. ✗ Both statement 1 and statement 2 are correct.

6406532306731. ✗ Only statement 1 is correct.

Question Number : 132 Question Id : 640653689559 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider a function $f(x, y) = x^2 + y^2 - 4x - 2y + 5$. Using gradient descent algorithm, with an initial guess of (3, 2) and learning rate of 0.1, what will be the value of (x, y) after one iteration?

Options :

6406532306764. ❌ $x = 3.2, y = 2.2$

6406532306765. ❌ $x = 3, y = 2$

6406532306766. ❌ $x = 1.8, y = 0.8$

6406532306767. ✓ $x = 2.8, y = 1.8$

Question Number : 133 Question Id : 640653689561 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

A firm produces two goods A and B . Let x and y denote the prices per unit of A and B , respectively. Sum of the prices for each unit of these two goods is 60. The profit on these goods is evaluated as $2x^2y$. What should the prices of these two products be if the profit is to be maximized?

Options :

6406532306769. ✓ $x = 40, y = 20$

6406532306770. ❌ $x = 20, y = 40$

6406532306771. ❌ $x = 30, y = 30$

6406532306772. ❌ $x = 0, y = 60$

6406532306773. ❌ None of these

Sub-Section Id :

640653100841

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 134 Question Id : 640653689546 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

Let $A = \begin{pmatrix} 1 & 0 & 1 \\ 1 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$. One of the eigenvalue of A is given to be -1 with

the corresponding eigenvector $[0, 1, 0]^T$. Find the Schur's decomposition of A , i.e., find a matrix U with orthonormal columns such that $U^T A U$ is uppertriangular.

Options :

6406532306732. ✘ $\begin{pmatrix} 1 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

6406532306733. ✘ $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

6406532306734. ✓ $\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

6406532306735. ✘ $\begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$

Sub-Section Number :

4

Sub-Section Id :

640653100842

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 135 Question Id : 640653689547 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let $A \in \mathbb{C}^{2 \times 2}$ where $A = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$.

Which of the following statements are true about A ?

Options :

6406532306736. ❌ A is Hermitian matrix.

6406532306737. ✓ A is not Hermitian matrix.

6406532306738. ✓ A is unitarily diagonalizable.

6406532306739. ❌ A is not unitarily diagonalizable.

Sub-Section Number : 5

Sub-Section Id : 640653100843

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689548 Question Type : COMPREHENSION Sub Question Shuffling

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (136 to 137)

Question Label : Comprehension

Consider a matrix $A = \begin{pmatrix} 3 & 2 & 1 \\ 2 & 3 & 1 \\ 0 & 0 & 1 \end{pmatrix}$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 136 Question Id : 640653689549 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

For an $n \times n$ invertible matrix A , the ratio $\frac{\sigma_1}{\sigma_n}$ gives the condition number of A , where σ_1 and σ_n represent the largest and the smallest singular values of A , respectively. What will be the condition number $\frac{\sigma_1}{\sigma_3}$ for

the given matrix A ? 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 :

2.20 to 2.26

Question Number : 137 Question Id : 640653689550 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Is the matrix A positive definite?

Options :

6406532306741. ✓ Yes

6406532306742. ✗ No

Question Id : 640653689551 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (138 to 139)

Question Label : Comprehension

Suppose the SVD of a matrix A is given as

$$A = \begin{bmatrix} 4/3\sqrt{5} & -1/\sqrt{5} & 2/3 \\ 5/3\sqrt{5} & 0 & -2/3 \\ -2/3\sqrt{5} & -2/\sqrt{5} & -1/3 \end{bmatrix} \begin{bmatrix} 3 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} 2/\sqrt{5} & -1/\sqrt{5} & 0 \\ 1/\sqrt{5} & 2/\sqrt{5} & 0 \\ 0 & 0 & 1 \end{bmatrix}^T$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 138 Question Id : 640653689552 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

What is the rank of A ?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 139 Question Id : 640653689553 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options are true?

Options :

6406532306744. ✓ $\text{Columnspace}(A) = \text{span} \left\{ \begin{pmatrix} 4 \\ 5 \\ -2 \end{pmatrix}, \begin{pmatrix} -1 \\ 0 \\ -2 \end{pmatrix} \right\}$

6406532306745. ✘ $\text{Columnspace}(A) = \text{span} \left\{ \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix}, \begin{pmatrix} -1 \\ 2 \\ 0 \end{pmatrix} \right\}$

6406532306746. ✘ $\text{Nullspace}(A) = \text{span} \left\{ \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix}, \begin{pmatrix} -1 \\ 2 \\ 0 \end{pmatrix} \right\}$

6406532306747. ✓ $\text{Nullspace}(A) = \text{span} \left\{ \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} \right\}$

Sub-Section Number :

6

Sub-Section Id :

640653100844

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 140 Question Id : 640653689554 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which among the following statements are true about principal component analysis (PCA)?

Options :

6406532306748. ✘ PCA is a supervised learning algorithm.

6406532306749. ✓ Principal components are the eigenvectors of the sample covariance matrix.

6406532306750. ❌ Principal components are eigenvectors of the centered data matrix.

6406532306751. ✓ If p_1 and p_2 are the principal component vectors, then p_1 is orthogonal to p_2 .

Sub-Section Number : 7

Sub-Section Id : 640653100845

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689555 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (141 to 143)

Question Label : Comprehension

Consider the following dataset:

$$\left\{ \begin{pmatrix} 4 \\ 1 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \end{pmatrix}, \begin{pmatrix} 5 \\ 4 \end{pmatrix}, \begin{pmatrix} 1 \\ 0 \end{pmatrix} \right\}$$

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

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 141 Question Id : 640653689556 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Compute the sample covariance matrix C for the given dataset.

Options :

6406532306752. ❌
$$C = \frac{1}{4} \begin{pmatrix} 46 & 30 \\ 30 & 36 \end{pmatrix}$$

6406532306753. ✓

$$C = \frac{1}{4} \begin{pmatrix} 10 & 6 \\ 6 & 10 \end{pmatrix}$$

6406532306754. ✘ $C = \frac{1}{4} \begin{pmatrix} 46 & 30 \\ 30 & 46 \end{pmatrix}$

6406532306755. ✘ $C = \frac{1}{4} \begin{pmatrix} 36 & 30 \\ 30 & 36 \end{pmatrix}$

Question Number : 142 Question Id : 640653689557 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Which is the principal direction that is chosen for performing PCA?

Options :

6406532306756. ✘ $\begin{pmatrix} 1/\sqrt{2} \\ -1/\sqrt{2} \end{pmatrix}$

6406532306757. ✓ $\begin{pmatrix} 1/\sqrt{2} \\ 1/\sqrt{2} \end{pmatrix}$

6406532306758. ✘ $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$

6406532306759. ✘ $\begin{pmatrix} 0 \\ 1 \end{pmatrix}$

Question Number : 143 Question Id : 640653689558 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

If $\tilde{x}_1, \tilde{x}_2, \tilde{x}_3$ and \tilde{x}_4 are the projections of the data points onto the first principal component, then which among the following are true?

Options :

6406532306760. ✘ $\tilde{x}_1 = \begin{pmatrix} 3 \\ 0 \end{pmatrix}, \tilde{x}_2 = \begin{pmatrix} 3 \\ 0 \end{pmatrix}, \tilde{x}_3 = \begin{pmatrix} 5 \\ 0 \end{pmatrix}, \tilde{x}_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

6406532306761. ✘ $\tilde{x}_1 = \begin{pmatrix} 5/2 \\ 5/2 \end{pmatrix}, \tilde{x}_2 = \begin{pmatrix} 5/2 \\ 5/2 \end{pmatrix}, \tilde{x}_3 = \begin{pmatrix} 9/2 \\ 9/2 \end{pmatrix}, \tilde{x}_4 = \begin{pmatrix} 1/2 \\ 1/2 \end{pmatrix}$

6406532306762. ✘ $\tilde{x}_1 = \begin{pmatrix} 3 \\ 0 \end{pmatrix}, \tilde{x}_2 = \begin{pmatrix} 3 \\ 0 \end{pmatrix}, \tilde{x}_3 = \begin{pmatrix} 5 \\ 4 \end{pmatrix}, \tilde{x}_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

6406532306763. ✓ $\tilde{x}_1 = \begin{pmatrix} 3 \\ 2 \end{pmatrix}, \tilde{x}_2 = \begin{pmatrix} 3 \\ 2 \end{pmatrix}, \tilde{x}_3 = \begin{pmatrix} 5 \\ 4 \end{pmatrix}, \tilde{x}_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

Sub-Section Number : 8

Sub-Section Id : 640653100846

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 144 Question Id : 640653689560 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Find the area of the largest rectangle that can be inscribed in a semicircle $y = \sqrt{2 - x^2}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Java

Section Id :	64065348508
Section Number :	10
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
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100847
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 145 **Question Id :** 640653689562 **Question Type :** MCQ **Is Question**

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

Correct Marks : 0

Question Label : Multiple Choice Question

**THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : PROGRAMMING 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 :

6406532306774. ✓ YES

6406532306775. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653100848

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 146 Question Id : 640653689564 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.util.*;  
  
public class SetIteratorTest {  
    public static void main(String[] args) {  
        var set1 = new HashSet<String>();  
        set1.add("Cherry");  
        set1.add("Banana");  
        set1.add("Apple");  
        set1.add("Date");  
  
        var set2 = new TreeSet<String>(set1);  
        Iterator<String> it1 = set1.iterator();  
        Iterator<String> it2 = set2.iterator();  
  
        while (it1.hasNext()) {  
            System.out.println(it1.next());  
        }  
  
        while (it2.hasNext()) {  
            System.out.println(it2.next());  
        }  
    }  
}
```

Choose the correct option.

Options :

it1 will visit elements of **set1** in sorted order.

6406532306780. ❌ it2 will visit elements of **set2** in sorted order.

it1 will visit elements of **set1** in the order in which they were inserted.

6406532306781. ❌ it2 will visit elements of **set2** in sorted order.

it1 will visit elements of **set1** in unspecified order.

6406532306782. ✓ it2 will visit elements of **set2** in sorted order.

it1 will visit elements of **set1** in the order in which they were inserted.

6406532306783. ❌ it2 will visit elements of **set2** in unspecified order.

Question Number : 147 Question Id : 640653689567 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the Java code given below.

```
interface Language{
    void display();
}

class French implements Language{
    public void display() {
        System.out.println("French Language");
    }
}

class English implements Language{
    public void display() {
        System.out.println("English Language");
    }
}

class LanguageList{
    private Object[] LArr = {new French(), new English()};
    public void getInfo(){
        for(int i = 0; i < LArr.length; i++){
            //LINE 1
        }
    }
}

public class Test{
    public static void main(String[] args) {
        LanguageList aList = new LanguageList();
        aList.getInfo();
    }
}
```

Identify the appropriate option to fill in place of LINE 1 such that the output is
French Language
English Language

Options :

6406532306792. * LArr[i].display();

6406532306793. ✘ ((English)LArr[i]).display();

6406532306794. ✘ ((French)LArr[i]).display();

6406532306795. ✓ ((Language)LArr[i]).display();

Question Number : 148 Question Id : 640653689568 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following Java code.

```
import java.util.stream.*;

public class Test {
    public static void main(String[] args) {
        String[] colors = {"red", "green", "blue", "yellow"};
        Stream.of(colors).map((color) -> color.length())
            .filter((length) -> length % 2 == 0)
            .forEach((x) -> System.out.println(x));
    }
}
```

What will the output be?

Options :

3

6406532306796. ✘ 5

blue

6406532306797. ✘ yellow

4

6406532306798. ✓ 6

red
green

6406532306799. *

Question Number : 149 Question Id : 640653689569 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Person {  
    String name;  
    // Constructor  
    public String toString(){  
        return name;  
    }  
}  
class Instructor extends Person implements Cloneable {  
    int salary;  
    // Constructor  
    public Instructor clone() throws CloneNotSupportedException{  
        return (Instructor)super.clone();  
    }  
    public String toString(){  
        return (super.toString() + ": " + salary);  
    }  
}  
public class Test {  
    public static void main(String[] args) throws CloneNotSupportedException{  
        Instructor i1 = new Instructor("Thangarajan", 150000);  
        Instructor i2 = i1.clone();  
        i2.name = "Monika";  
        i2.salary = 240000;  
        System.out.println(i1 + "\n" + i2);  
    }  
}
```

What will the output be?

Options :

Thangarajan: 240000

6406532306800. ✘ Monika: 240000

Thangarajan: 240000

6406532306801. ✘ Monika: 150000

Thangarajan: 150000

6406532306802. ✘ Monika: 150000

Thangarajan: 150000

6406532306803. ✓ Monika: 240000

Question Number : 150 Question Id : 640653689570 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class Validation {  
    public boolean validate(int a, int b) {  
        assert a > 0: "a should be positive"; //LINE 1  
        assert b > 0: "b should be positive"; //LINE 2  
        return true;  
    }  
}  
public class AssertTest {  
    public static void main(String[] args) {  
        int a = -10;  
        int b = -5;  
        int result = 0;  
        assert a != 0: a; //LINE 3  
        assert b != 0: b; //LINE 4  
        Validation obj = new Validation();  
        if (obj.validate(a, b))  
            result = a - b;  
        assert result > 0: result; //LINE 5  
        System.out.println(result);  
    }  
}
```

Identify the line that throws `AssertionError` when the program is executed as:

`java -ea AssertTest`

Options :

6406532306804. ✓ LINE 1

6406532306805. ✗ LINE 2

6406532306806. ✗ LINE 3

6406532306807. ✗ LINE 4

6406532306808. ✗ LINE 5

Question Number : 151 Question Id : 640653689573 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the Java code given below.

```
class MinScoreException extends Exception{
    public MinScoreException() {
        super("application rejected: low score");
    }
}

class Application{
    private int score;
    public Application(int s){
        score = s;
    }
    public void validate() throws MinScoreException{
        if(score < 75)
            throw new MinScoreException();
        System.out.println("applied successfully");
    }
}
class Test{
    public static void main(String[] args) {
        try {
            Application ap1 = new Application(65);
            Application ap2 = new Application(90);
            ap1.validate();
            ap2.validate();
        }
        catch(Exception e) {
            System.out.println(e.getMessage());
        }
    }
}
```

Choose the correct option.

Options :

This program generates output:

6406532306817. ✓ application rejected: low score

This program generates output:
application rejected: low score
applied successfully

6406532306818. ✘ applied successfully

This program generates output:
application rejected: low score
applied successfully

6406532306819. ✘ applied successfully

6406532306820. ✘ The program crashes due to the uncaught exception: MinScoreException

Question Number : 152 Question Id : 640653689574 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.util.*;
class Student {
    String name, subject;
    int marks;
    public Student(String n, String s, int m){
        name = n;
        subject = s;
        marks = m;
    }
}
public class Test{
    public static void printStudents(ArrayList<Student> sL) {
        var map = new LinkedHashMap<String, Integer>();
        for(Student s:sL) {
            map.put(s.name, map.getOrDefault(s.name, 0) + s.marks);
        }
        for (Map.Entry<String, Integer> e:map.entrySet()) {
            System.out.println(e.getKey()+" = " + e.getValue());
        }
    }
    public static void main(String[] args) {
        ArrayList<Student> sList = new ArrayList<Student>();
        sList.add(new Student("Carl", "Maths", 80));
        sList.add(new Student("Rayan", "Maths", 89));
        sList.add(new Student("Lokesh", "Social", 100));
        sList.add(new Student("Carl", "Science", 98));
        printStudents(sList);
    }
}
```

What will the output be?

Options :

Carl = 98
Rayan = 89
6406532306821. ✘ Lokesh = 100

Carl = 178
Lokesh = 100
6406532306822. ✘ Rayan = 89

6406532306823. ✓

```
Carl = 178
Rayan = 89
Lokesh = 100
```

```
Carl = 80
Lokesh = 100
6406532306824. ✘ Rayan = 89
```

Question Number : 153 Question Id : 640653689575 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following code.

```
import java.util.*;
public class TreeTest {
    public static void main(String[] args) {
        ArrayList<String> list = new ArrayList<String>();
        list.add("Monkey");
        list.add("Lion");
        list.add("Goat");
        list.add("Elephant");
        HashSet<String> set1 = new HashSet<String>(list);
        TreeSet<String> set2 = new TreeSet<String>(set1);
        set2.addAll(set1);
        System.out.println(set2);
    }
}
```

Choose the correct option.

Options :

This program generates the output:

6406532306825. ✘ [Elephant, Goat, Lion, Monkey, Elephant, Goat, Lion, Monkey]

This program generates the output:

6406532306826. ✓ [Elephant, Goat, Lion, Monkey]

6406532306827. ❌ This program terminates abnormally due to UnsupportedOperationException.

This program generates the output:

6406532306828. ❌

Sub-Section Number : 3

Sub-Section Id : 640653100849

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 154 Question Id : 640653689565 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
public class ListOperations {  
    public <E> int countOccurrences(E[] arr, E element) {  
        // Counts the number of occurrences of the element in the array  
    }  
  
    public <E extends Comparable<E>> void sort(E[] arr) {  
        // Sorts the array  
    }  
}
```

How does class ListOperations look after type erasure?

Options :

6406532306784. ❌

```
public class ListOperations {  
    public int countOccurrences(Object[] arr, Object element) {  
        // Counts the number of occurrences of the element in the array  
    }  
  
    public void sort(Object[] arr) {  
        // Sorts the array  
    }  
}
```

```
public class ListOperations {  
    public int countOccurrences(Object[] arr, Object element) {  
        // Counts the number of occurrences of the element in the array  
    }  
  
    public void sort(Comparable[] arr) {  
        // Sorts the array  
    }  
}
```

6406532306785. ✓ }

```
public class ListOperations {  
    public int countOccurrences(Object[] arr, Object element) {  
        // Counts the number of occurrences of the element in the array  
    }  
  
    public void sort(E[] arr) {  
        // Sorts the array  
    }  
}
```

6406532306786. ✘ }

```
public class ListOperations {  
    public int countOccurrences(E[] arr, E element) {  
        // Counts the number of occurrences of the element in the array  
    }  
  
    public void sort(E[] arr) {  
        // Sorts the array  
    }  
}
```

6406532306787. ✘ }

Question Number : 155 Question Id : 640653689571 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the Java code given below.

```
import java.util.*;
class Candidate{
    String name;
    int aptitudeScore;
    //Constructor to initialize the instance variables
    public String toString(){
        return name;
    }
}
public class Test{
    public static boolean check(int aptitudeScore ){
        if(aptitudeScore > 75)
            return true;
        return false;
    }
    public static void printShortlistCdtList(List<Candidate> cList){
        Iterator<Candidate> it = cList.iterator();
        while (it.hasNext()){
            Candidate c = it.next();
            if(!check(c.aptitudeScore))
                it.remove();
        }
    }
    public static void main(String[] args) {
        var list = new ArrayList<Candidate>();
        list.add(new Candidate("Meena", 89));
        list.add(new Candidate("Manu", 40));
        list.add(new Candidate("Payal", 68));
        list.add(new Candidate("Ayan", 78));
        printShortlistCdtList(list);
        System.out.println(list);
    }
}
```

Choose the correct option.

Options :

6406532306809. ✘ This program generates the output: [Ayan, Meena]

6406532306810. ✘ This program generates the output: [Manu, Payal]

6406532306811. ✓ This program generates the output: [Meena, Ayan]

6406532306812. ✘ This program generates the output: [Ayan, Manu, Meena, Payal]

Question Number : 156 Question Id : 640653689572 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

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

//MathUtility.java

```
package mathutil;
public class MathUtility{
    long getFibonacci(int n){
        // return Fibonacci(n)
    }
    protected long add(long n1,long n2){
        //return n1 + n2
    }
}
```

//Test1.java

```
package test;
import mathutil.*;
class Calculator extends MathUtility{
    long FibSum(int num,int i) {
        long fib = this.getFibonacci(i); // LINE 1
        long sum = this.add(num, fib);   // LINE 2
        return sum;
    }
}
class Test1{
    public static void main(String args[]) {
        Calculator c = new Calculator();
        long val = c.add(3, 4);      // LINE 3
        System.out.println("Fibonacci Sum: "+ c.FibSum(4,2));
    }
}
```

Choose the correct option regarding these two .java files.

Options :

6406532306813. ✓ LINE 1 & LINE 3 will lead to compilation error.

6406532306814. ✗ LINE 2 & LINE 3 will lead to compilation error.

6406532306815. ✗ Only LINE 1 will lead to compilation error.

6406532306816. ✗ The code will compile successfully.

Sub-Section Number :	4
Sub-Section Id :	640653100850
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 157 Question Id : 640653689563 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

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

```
import java.util.*;
interface Scorable {
    public abstract int getScore();
}
public class Student implements Scorable {
    private int score;
    // Constructor
    // method getScore() that returns score of Student
}
public class Test {
    // LINE 1: FUNCTION HEADER
    {
        // invokes method getScore()
        // to print the value of highest score
    }
    public static void main(String[] args) {
        Scorable[] scores = {new Student(85), new Student(92), new Student(78)};
        printHighestScore(scores);
    }
}
```

Choose the correct option(s).

Options :

6406532306776. ❀ public static void printHighestScore(<?> items)

6406532306777. ✓ public static <T extends Scorable> void printHighestScore(T[] items)

6406532306778. ✗ public static <T extends Student> void printHighestScore(T[] items)

6406532306779. ✓ public static void printHighestScore(Scorable[] items)

Question Number : 158 Question Id : 640653689576 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the Java code given below.

```
import java.util.*;
class Test {
    public static String search(Deque<Integer> q, int num){
        while(q.size() > 0) {
            // LINE 1
            {
                return "Element found";
            }
        }
        return "Element not found";
    }
    public static void main(String[] args) {
        Deque<Integer> queue1 = new ArrayDeque<Integer>();
        queue1.add(60);
        queue1.add(36);
        queue1.add(96);
        queue1.add(70);
        System.out.println(search(queue1, 96));
    }
}
```

Identify the appropriate option(s) to fill in place of LINE 1 such that the output is Element found

Options :

6406532306829. ✘ if(q.peek() == num)

6406532306830. ✘ if(q.element() == num)

6406532306831. ✓ if(q.poll() == num)

6406532306832. ✓ if(q.remove() == num)

Sub-Section Number : 5

Sub-Section Id : 640653100851

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 159 Question Id : 640653689566 Question Type : MSQ Is Question

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

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the Java code given below that prints the price of cars. From among the options, identify the appropriate function header for the function `printPrice` that takes as input a list of cars and prints their prices.

```
import java.util.*;
class Car{
    private double price;
    public Car(double p){
        price = p;
    }
    public double getPrice(){
        return price;
    }
}
class Hyundai extends Car{
    public Hyundai(double p){
        super(p);
    }
}
class Renault extends Car{
    public Renault(double p){
        super(p);
    }
}
public class Test {
    // FUNCTION HEADER for function printPrice
    {
        for(int i = 0; i < lst.size(); i++){
            System.out.println(lst.get(i).getPrice());
        }
    }
    public static void main(String[] args) {
        List<Hyundai> h = new ArrayList<Hyundai>();
        h.add(new Hyundai(1.30));
        h.add(new Hyundai(1.20));
        List<Renault> r = new ArrayList<Renault>();
        r.add(new Renault(2.30));
        r.add(new Renault(5.60));
        printPrice(h);
        printPrice(r);
    }
}
```

Choose the correct option(s).

Options :

6406532306788. ❌ `public static void printPrice(List<Car> lst)`

6406532306789. ❌ `public static void printPrice(List<Renault> lst)`

6406532306790. ✓ public static void printPrice(List<? extends Car> lst)

6406532306791. ✗ public static void printPrice(List<Object> lst)

Question Number : 160 Question Id : 640653689577 Question Type : MSQ Is Question

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

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following code that computes the sum of the even numbers from array iArr.

```
import java.util.*;  
  
//CODE BLOCK: Define Filter  
  
public class LTest{  
    public static <T extends Number> double sum(T[] x, Filter<T> pred) {  
        double s = 0.0;  
        for(var i : x){  
            if(pred.isValid(i))  
                s += i.doubleValue();  
        }  
        return s;  
    }  
  
    public static void main(String[] args) {  
        Integer[] iArr = new Integer[]{1, 2, 3, 4, 5};  
        System.out.print(sum(iArr, i -> i % 2 == 0));  
    }  
}
```

Identify the correct option(s) to fill in place of CODE_BLOCK such that the output is 6.0

Options :

```
interface Filter<T>{  
    public boolean isValid(T a);  
}
```

6406532306833. ✓

```
abstract class Filter<T extends Number>{
    public abstract boolean isValid(T a);
```

6406532306834. ✘ }

```
interface Filter<T extends Number>{
    public boolean isValid(T a);
```

6406532306835. ✓ }

```
interface Filter<T extends Number>{
    public abstract boolean isValid(T a);
    public abstract boolean predicate(T a);
```

6406532306836. ✘ }

AppDev2

Section Id :	64065348509
Section Number :	11
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100852
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 161 Question Id : 640653689578 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MODERN APPLICATION DEVELOPMENT II (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406532306837. ✓ YES

6406532306838. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653100853

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 162 Question Id : 640653689579 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following JavaScript code.

```

function promiseBuilder(t) {
  return new Promise((res, rej) => {
    setTimeout(() => {
      const count = Math.floor(t / 1000)
      if (count > 3) {
        res(count)
      } else {
        rej(count * 2)
      }
    }, t)
  })
}

async function getData() {
  let data1 = null,
    data2 = null
  try {
    data1 = await promiseBuilder(5000)
  } catch (e) {
    data1 = 30
  }
  try {
    data2 = await promiseBuilder(2000)
  } catch (e) {
    data2 = 40
  }
  return data1 + data2
}

getData().then(
  (res) => {
    console.log(8 * res)
  },
  (err) => {
    console.log(6 * err)
  }
)

```

What will be logged on to the console?

Options :

6406532306839. ✘ 56

6406532306840. ✘ 272

6406532306841.

✓ 360

6406532306842. ✘ 560

Question Number : 163 Question Id : 640653689581 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the Vue application with markup index.html and JavaScript app.js

```
index.html
```

```
<body>
  <div id="app"></div>
</body>
```

```
app.js
```

```
const NavBar = {
  template: `<ul>
    <li> Home </li>
    <slot><li>Bowling Average</li></slot>
  </ul>`,
}

const Batsman = {
  template: `<NavBar><li>Batting Average</li><li>Strike
Rate</li></NavBar>`,
  components: {
    NavBar,
  },
}

new Vue({
  el: '#app',
  template: `<Batsman />`,
  components: {
    Batsman,
  },
})
```

Suppose the application is running on “<http://localhost:8080>” . What will be rendered by the browser?

Options :

6406532306847. ❌ • Home

• Bowling Average

6406532306848. ❌ • Home

• Bowling Average

• Batting Average

6406532306849. ✓ • Home

• Batting Average

• Strike Rate

6406532306850. * • Bowling Average

• Batting Average

Question Number : 164 Question Id : 640653689583 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following Vue app with markup index.html and JavaScript app.js.

index.html

```
<body>
  <div id="app"></div>
</body>
```

app.js

```
const Dashboard = {
  template: `<div> This is dashboard for {{user.name}} </div>`,
  props: ['id'],
  data() {
    return {
      users: [
        { id: 1, name: 'User1' },
        { id: 2, name: 'User2' },
        { id: 3, name: 'User3' },
      ],
    }
  },
  computed: {
    user() {
      const user = this.users.find((user) => user.id == this.id)
      if (user) {
        return user
      } else {
        return this.users[2]
      }
    },
  },
}

const router = new VueRouter({
  routes: [{ path: '/dashboard/:id', component: Dashboard, props: true }],
})
new Vue({
  el: '#app',
  template: `<router-view />`,
  router,
})
```

Suppose the application is running on "<http://localhost:8080>". What will be rendered inside the router-view component of root component for the URL "<http://127.0.0.1:8080/#/dashboard/8>" ?

Options :

6406532306855. ❌ This is dashboard for User1

6406532306856. ❌ This is dashboard for User2

6406532306857. ✓ This is dashboard for User3

6406532306858. ❌ None of these

Question Number : 165 Question Id : 640653689586 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

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

index.html

```
<body>
  <div id="app"></div>
</body>
```

app.js

```
const players = [
  { name: 'Rohit', role: 'Batsman', runs: 397 },
  { name: 'Jaspreet', role: 'Bowler', wickets: 9 },
  { name: 'Virat', role: 'Batsman', runs: 355 },
  { name: 'Kuldeep', role: 'Bowler', wickets: 10 },
]

const Batsman = {
  template: `<div><span v-for="batsman in batsmans">{{batsman.name}}:
{{batsman.runs}}</span></div>`,
  computed: {
    batsmans() {
      return players.filter((player) => player.role == 'Bowler')
    },
  },
}

const Bowler = {
  template: `<div><span v-for="bowler in bowlers">{{bowler.name}}:
{{bowler.wickets}}</span></div>`,
  computed: {
    bowlers() {
      return players.filter((player) => player.role == 'Batsman')
    },
  },
}
```

```

const Players = {
  template: `<div>
    Ranking
    <router-view />
  </div>
  `,
}

const router = new VueRouter({
  routes: [
    {
      path: '/players',
      component: Players,
      children: [
        { path: '', component: Batsman, name: 'batsman' },
        { path: '*', component: Bowler, name: 'bowler' },
      ],
    },
  ],
})
new Vue({
  el: '#app',
  template: `<router-view />`,
  router,
})

```

Suppose the application is running on “<http://localhost:8080>” . What will be rendered inside the router-view component of Players component by the browser for the URL
[“http://localhost:8080/#/players/allrounder”](http://localhost:8080/#/players/allrounder)?

Options :

6406532306867. ✖ Jaspreet: Kuldeep:

6406532306868. ✖ Jaspreet: 9 Kuldeep: 10

6406532306869. ✓ Rohit: Virat:

6406532306870. ✖ Rohit:397 Virat:355

Question Number : 166 Question Id : 640653689588 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

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

index.html:

```
<style>
    .heading {
        color: yellow;
    }

    .raw-text {
        color: blue;
    }
</style>
<body>
    <div id="app">
        <p :class="[iteration ? 'heading' : 'raw-text']"> {{displayText}}
    </p>
    </div>
</body>
<script src=".//script.js"> </script>
```

app.js:

```
const app = new Vue({
  el: '#app',
  data: {
    iteration: 1,
  },
  computed: {
    displayText: function() {
      let result = "";
      for (let i = 0; i <= this.iteration; i++)
        result += sessionStorage.getItem("data");
      return result;
    }
  },
  mounted() {
    const iteration = sessionStorage.getItem("iteration") ?
    parseInt(sessionStorage.getItem("iteration")) + 2 : 1;
    if (iteration >= 1 && iteration < 7) {
      const data = sessionStorage.getItem("data");
      console.log(data);
      if (!data) sessionStorage.data = "JS";
      else
        sessionStorage.data += data;
      sessionStorage.iteration = iteration + 2;
      window.location.reload();
    }
  }
});
```

If you open the 'index.html' file in a browser, what content will be displayed on the browser screen after the automatic reloading of the browser tab stops?

Options :

6406532306878. ❌ Black

6406532306879. ❌ Blue

6406532306880. ✓ Yellow

6406532306881. ❌ None of these

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

Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below javascript program, and predict the output assuming the variable "random_num" always has a value greater than 8.

Note: `Math.random()` method returns a random number from 0 (inclusive) up to but not including 1 (exclusive)

```
const num = "9";

new Promise((rej, res) => {
    const random_num = Math.floor(Math.random() * 10);

    if (random_num == num) rej(random_num)
    else res(num + num);
}).then(
    (msg) => console.log("Some Data Came"),
    (msg) => console.log("Some Data Lost")
).then(data => {
    console.log("Data Sent");
    return data;
}).then(num => console.log(num));
```

Options :

6406532306890. ✖ Some Data Came

Some Data Lost

Some Data Lost

6406532306891. ✖ Some Data Came

Data Sent

Data Sent

6406532306892. ✓ Some Data Came

Data Sent

undefined

6406532306893. ✖ Some Data Lost

Data Sent

undefined

6406532306894. ✘ Some Data Lost

undefined

Data Sent

Question Number : 168 Question Id : 640653689594 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the below javascript program, and predict the output if executed.

```
let x = 5;
const obj1 = {
    x : 10,
    func : function () {
        console.log(x * this.x)
    }
}
const obj2 = {
    x : 20,
    func : () => {
        console.log(this.x);
        obj1.func.call(obj2);
    }
}
obj2.func();
```

Options :

6406532306903. ✘ 20

100

6406532306904. ✘ 5

NaN

6406532306905. ✘ 20

NaN

6406532306906. ✘ 5

50

6406532306907. ✓ undefined

100

6406532306908. ✘ undefined

50

Sub-Section Number : 3

Sub-Section Id : 640653100854

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 169 Question Id : 640653689580 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the Vue app with markup index.html and script app.js

index.html

```
<body>
  <div id="app"></div>
</body>
```

app.js

```
Vue.component('NavBar', {
  template: `<div> This is navbar </div>`,
})

const Model = {
  template: `<div> This is model </div>`,
}

new Vue({
  el: '#app',
  template: `<div><NavBar /><Model/></div>`,
})
```

Suppose the application is running on "<http://localhost:8080>" . What will be rendered by the browser?

Options :

6406532306843. ✓ This is navbar

6406532306844. ✗ This is model

6406532306845. ✗ This is navbar

This is model

6406532306846. ✗ None of these

Question Number : 170 Question Id : 640653689592 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following statements is false regarding promise in javascript?

Options :

6406532306895. ✗ A promise has 3 states - pending, fulfilled & rejected.

6406532306896. ✗ The promises can be chained to perform dependent tasks.

6406532306897. ✓ Promises can have only two states, Fulfilled and Rejected.

6406532306898. ✗ A promise constructor accepts an executor function, which in itself received 2 parameters for resolve and reject functions.

Sub-Section Number : 4

Sub-Section Id : 640653100855

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 171 Question Id : 640653689582 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Consider the following Vue app with markup index.html and JavaScript app.js.

index.html

```
<body>
  <div id="app"></div>
</body>
```

app.js

```
const Dashboard = {
  template: `<div> This is dashboard for {{user.name}} </div>`,
  props: ['id'],
  data() {
    return {
      users: [
        { id: 1, name: 'User1' },
        { id: 2, name: 'User2' },
        { id: 3, name: 'User3' },
      ],
    }
  },
  computed: {
    user() {
      const user = this.users.find(user => user.id == this.id)
      if (user) {
        return user
      } else {
        return this.users[2]
      }
    },
  },
}

const router = new VueRouter({
  routes: [{ path: '/dashboard/:id', component: Dashboard, props: true }],
})

new Vue({
  el: '#app',
  template: `<router-view />`,
  router,
})
```

Suppose the application is running on "<http://localhost:8080>". What will be rendered inside the router-view component of root component for the URL "<http://localhost:8080/dashboard/1>" ?

Options :

6406532306851. ✓ This is dashboard for User1

6406532306852. ✗ This is dashboard for User2

6406532306853. ✘ This is dashboard for User3

6406532306854. ✘ None of these

Question Number : 172 Question Id : 640653689585 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

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

index.html

```
<body>
  <div id="app"></div>
</body>
```

app.js

```
const players = [
  { name: 'Rohit', role: 'Batsman', runs: 397 },
  { name: 'Jaspreet', role: 'Bowler', wickets: 9 },
  { name: 'Virat', role: 'Batsman', runs: 355 },
  { name: 'Kuldeep', role: 'Bowler', wickets: 10 },
]

const Batsman = {
  template: `<div><span v-for="batsman in batsmans">{{batsman.name}}: {{batsman.runs}}</span></div>`,
  computed: {
    batsmans() {
      return players.filter((player) => player.role == 'Bowler')
    },
  },
}

const Bowler = {
  template: `<div><span v-for="bowler in bowlers">{{bowler.name}}: {{bowler.wickets}}</span></div>`,
  computed: {
    bowlers() {
      return players.filter((player) => player.role == 'Batsman')
    },
  },
}
```

```

const Players = {
  template: `<div>
    Ranking
    <router-view />
  </div>
  `,
}

const router = new VueRouter({
  routes: [
    {
      path: '/players',
      component: Players,
      children: [
        { path: '', component: Batsman, name: 'batsman' },
        { path: '*', component: Bowler, name: 'bowler' },
      ],
    },
  ],
})
new Vue({
  el: '#app',
  template: `<router-view />`,
  router,
})

```

Suppose the application is running on “<http://localhost:8080>” . What will be rendered inside the router-view component of Players component by the browser for the URL
[“<http://localhost:8080/#/players>”](http://localhost:8080/#/players) ?

Options :

6406532306863. ✓ Jaspreet: Kuldeep:

6406532306864. ✗ Jaspreet: 9 Kuldeep: 10

6406532306865. ✗ Rohit: Virat:

6406532306866. ✗ Rohit:397 Virat:355

Question Number : 173 Question Id : 640653689587 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4.5

Question Label : Multiple Choice Question

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

index.html:

```
<style>
    .heading {
        color: yellow;
    }

    .raw-text {
        color: blue;
    }
</style>
<body>
    <div id="app">
        <p :class="[iteration ? 'heading' : 'raw-text']"> {{displayText}}
    </p>
    </div>
</body>
<script src=". ./script.js"> </script>
```

app.js:

```
const app = new Vue({
  el: '#app',
  data: {
    iteration: 1,
  },
  computed: {
    displayText: function() {
      let result = "";
      for (let i = 0; i <= this.iteration; i++)
        result += sessionStorage.getItem("data");
      return result;
    }
  },
  mounted() {
    const iteration = sessionStorage.getItem("iteration") ?
      parseInt(sessionStorage.getItem("iteration")) + 2 : 1;
    if (iteration >= 1 && iteration < 7) {
      const data = sessionStorage.getItem("data");
      console.log(data);
      if (!data) sessionStorage.data = "JS";
      else
        sessionStorage.data += data;
      sessionStorage.iteration = iteration + 2;
      window.location.reload();
    }
  }
});
```

Suppose you open the file “index.html” in a browser, what will be shown on the browser screen post which browser tab will not be reloaded programmatically?

If you open the 'index.html' file in a browser, what content will be displayed on the browser screen after the automatic reloading of the browser tab stops?

Options :

6406532306871. ❌ JSJS

6406532306872. ❌ JSJSJS

6406532306873. ✓ JSJSJSJS

6406532306874. ❌ NaNNaNNaN

6406532306875. ✘ NaNNaN

6406532306876. ✘ NaNNaNNaNNaN

6406532306877. ✘ None of these

Question Number : 174 Question Id : 640653689589 Question Type : MCQ Is Question

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

Correct Marks : 4.5

Question Label : Multiple Choice Question

Suppose you are organizing a ceremony to award the startup companies who have progressed considerably well in the past few years. You have received a lot of registrations. The committee has decided to shortlist the companies based on the following 2 criteria:

1. The company must have a website
2. The company must have a capital of more than 40000

Fill in the **code1** & **code2**, which can be used in Vuex Store to update the “awardees” state variable with the objects of those companies who satisfy the above-mentioned criteria. The objects to be inserted in the “awardees” state variable must only have the company name and a random token generated in the “send_task” action function.

```

const store = new Vuex.Store({
  state : {
    companies : [
      {
        name : 'sample1',
        website : 'sample1.com',
        capital : 50000
      },
      {
        name : 'sample2',
        website : null,
        capital : 75000
      },
      {
        name : 'sample3',
        website : 'sample3.com',
        capital : 42000
      },
      {
        name : 'sample4',
        website : 'sample4.com',
        capital : 38000
      },
    ],
    awardees : []
  },
  mutations : {
    update_final(state, payload) {
      for (company of state.companies)
        code2
      }
    },
    actions : {
      send_task : function (context) {
        const token = get_token(); // generates a random token
        code1
      }
    }
  })
}

```

Options :

```

code1: this.$store.commit("update_final", {"min" : 40000, "token" : token});
code2: if (company.website != null && company.capital > payload) {
  const obj = {};
  obj.name = company.name;
  obj.token = payload.token
  state.awardees.push(company)
}

```

6406532306882. *

```
code1: context.commit("update_final", 40000, token);
code2: if (company.website != null && capital > payload)
        awardees.push(company)
```

6406532306883. ✘

```
code1: this.$store.commit("update_final", 40000, token);
code2: if (company.website != null && capital > payload.min)
        awardees.push(company)
```

6406532306884. ✘

```
code1: context.commit("update_final", {"min": 40000, "token": token});
code2: if (company.website != null && company.capital > payload.min) {
        const obj = {};
        obj.name = company.name;
        obj.token = payload.token
        state.awardees.push(company)
    }
```

6406532306885. ✓

Sub-Section Number :	5
Sub-Section Id :	640653100856
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 175 Question Id : 640653689584 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are true regarding JSON Web Tokens?

Options :

6406532306859. ✓ Each token has three components, header, payload and signature

6406532306860. ✘ Each token has two components, payload and signature.

6406532306861. ✓ Each component of the token is encoded using Base-64.

6406532306862. ✓ Components of the token are joined using period.

Question Number : 176 Question Id : 640653689590 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statement(s) is/are true, regarding REST and GraphQL?

Options :

6406532306886. ✓ GraphQL helps to fetch exactly the same data which is needed, and avoids over fetching as well as under fetching

6406532306887. ✓ In general, a GraphQL response always returns 200 status code, with the "error" field containing the errors (if any).

6406532306888. ✓ A REST API provides multiple endpoints to access multiple resources.

6406532306889. ✗ None of these.

Sub-Section Number : 6

Sub-Section Id : 640653100857

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 177 Question Id : 640653689593 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

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

Options :

6406532306899. ✓ Vuex is a state management library for Vue.js applications.

6406532306900. ✗ Using Vuex always becomes difficult when an application scales.

6406532306901. ✓ Vuex provides actions for performing asynchronous operations.

6406532306902. * The Vuex getters are not reactive.

MLT

Section Id :	64065348510
Section Number :	12
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100858
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 178 Question Id : 640653689595 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MACHINE LEARNING TECHNIQUES (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406532306909. ✓ YES

6406532306910. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653100859

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689596 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (179 to 181)

Question Label : Comprehension

Consider a training set $\{X, y\}$, where $X \in \mathbb{R}^{d \times n}$ and the target $y \in \mathbb{R}^n$.

Suppose a team decided to use linear regression model, $h = w^T X$ where $w \in \mathbb{R}^{d \times 1}$ that minimizes the objective function $L(w)$ given below

$$L(w) = \sum_{i=1}^n (w^T x_i - y_i)^2$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 179 Question Id : 640653689597 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

Let the dimensions of $d = 3$ and $n = 100$. What is the sum of the elements of $X(X^T w - y)$? If you think the given information is insufficient, 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 : 180 **Question Id :** 640653689598 **Question Type :** MSQ **Is Question**

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

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

Question Label : Multiple Select Question

Suppose we transform the data points X using a mapping $\Phi(\cdot)$. Assume there exists a kernel matrix K for the mapping $\Phi(\cdot)$. Moreover, we categorize the model as parametric and non-parametric according to the following definitions.

- **Parametric:** The samples in the training set are not necessary for making predictions on a test sample
- **non-Parametric:** All the samples in the training set are necessary for making predictions on a test sample

Check all that is true about the kernel regression.

Options :

6406532306912. ✘ The kernel regression is parametric

6406532306913. ✓ The kernel regression is non-parametric

6406532306914. ✓ The Kernel matrix K is positive semi-definite

6406532306915. ✓ In general, Kernel regression is computationally expensive than a simple linear regression

Question Number : 181 Question Id : 640653689599 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

The team modifies the relation as

$y = X^T w + \epsilon$ where $\epsilon \sim \mathcal{N}(0, \sigma^2)$.

Suppose that $\sigma^2 = 1$, $d = 3$ and $n = 100$.

Assume that $\sum_{i=1}^n (w^T x_i - y_i)^2 = 0$

for $w = w^*$. What is the negative log-likelihood of the dataset (X, y) at w^* ? Use logarithm to base 10.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

39 to 40

Sub-Section Number : 3

Sub-Section Id : 640653100860

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 182 Question Id : 640653689600 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

In a Ridge regression scenario with the following dataset:

$$X = \begin{bmatrix} -2 & 3 & 4 \end{bmatrix}$$

And the corresponding target vector:

$$Y = \begin{bmatrix} -15 \\ 18 \\ 24 \end{bmatrix}$$

The regularization parameter is set at $\lambda = 3$. Calculate the ratio of the Maximum Likelihood Estimate (MLE) weight vector (w_{MLE}) to the Ridge weight vector (w_{Ridge}) and select the correct range.

Options :

6406532306917. ✓ (1.05, 1.20)

6406532306918. ✗ (0.85, 0.95)

6406532306919. ✗ (1,1)

6406532306920. ✗ (3, 3.5)

Sub-Section Number : 4

Sub-Section Id : 640653100861

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 183 Question Id : 640653689601 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are the primary advantages of using L1 regularization

Options :

6406532306921. ✓ L1 regularization reduces the risk of overfitting.

6406532306922. ✓ L1 regularization tends to produce sparse models.

6406532306923. ✗ L1 regularization always improves the model's predictive accuracy on large datasets.

6406532306924. ✗ L1 regularization is primarily used to increase model complexity.

Question Number : 184 Question Id : 640653689605 Question Type : MSQ Is Question

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

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select all the statements that are true about decision trees and k-Nearest Neighbors (k-NN) in machine learning:

Options :

6406532306935. ✓ Decision trees are a supervised learning algorithm used for classifications.

6406532306936. ✓ The k-NN algorithm is a lazy learner, which means it doesn't build an explicit model during the training phase.

6406532306937. ✗ In k-NN, the value of k represents the number of features used for classification.

6406532306938. ✗ k-Nearest Neighbors (k-NN) is a parametric model that requires estimating probability distributions.

6406532306939. ✓ The depth of the tree is a hyperparameter and is typically chosen using cross-validation.

Sub-Section Number : 5

Sub-Section Id : 640653100862

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 185 Question Id : 640653689602 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Consider that the three weight vectors w_1, w_2 , and w_3 are learned for an eight-dimensional dataset using different regression models (Not in any particular order).

$$w_1 = [0.32, -0.12, 0, 0.42, -0.18, -0.05, 0.2, -0.09]$$

$$w_2 = [0.25, -0.08, 0.38, -0.22, 0.14, -0.31, 0.19, -0.12]$$

$$w_3 = [0.22, -0.11, 0.04, 0.16, 0.08, -0.03, 0.1, -0.14]$$

Select the most appropriate match for these weight vectors.

Options :

6406532306925. ✓ $w_1 \rightarrow$ Lasso regression, $w_2 \rightarrow$ Linear regression, $w_3 \rightarrow$ Ridge regression

6406532306926. ✗ $w_1 \rightarrow$ Ridge regression, $w_2 \rightarrow$ Lasso regression, $w_3 \rightarrow$ Linear regression

6406532306927. ✗ $w_1 \rightarrow$ Linear regression, $w_2 \rightarrow$ Ridge regression, $w_3 \rightarrow$ Lasso regression

6406532306928. ✗ $w_1 \rightarrow$ Ridge regression, $w_2 \rightarrow$ Linear regression, $w_3 \rightarrow$ Lasso regression

Question Number : 186 Question Id : 640653689603 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Given a design matrix $X \in \mathbb{R}^{d \times n}$ and a target vector $Y \in \mathbb{R}^{n \times 1}$, where d represents the number of features, n represents the number of data points, and the data is defined as:

$$X = \begin{bmatrix} 2 & 3 \\ 4 & 1 \end{bmatrix}$$

$$Y = \begin{bmatrix} 2 \\ 4 \end{bmatrix}$$

Calculate the coefficients β for Ridge regression with $\lambda = 2$.

Options :

6406532306929. ✘ $\beta = [0.75, 0.75]$

6406532306930. ✘ $\beta = [1, 0.5]$

6406532306931. ✘ $\beta = [0.5, 1]$

6406532306932. ✓ $\beta = [0.85, 0.12]$

6406532306933. ✘ None of these

Sub-Section Number : 6

Sub-Section Id : 640653100863

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 187 Question Id : 640653689604 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

You are working on a decision tree algorithm to classify whether a bank loan applicant will default on their loan based on several financial factors. The dataset includes Credit Score, Annual Income, Loan Amount, Loan Term as features.

The target variable is binary: 1 for "Default" and 0 for "No Default."

You have a dataset of 500 loan applicants, and you want to construct a decision tree to predict loan default. To determine the first split (root node), you'll use the information gain as the criterion. Here's the distribution of loan default in the dataset:

Default: 150 applicants No Default: 350 applicants

Calculate the Entropy for the initial dataset.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.83 to 0.92

Question Number : 188 Question Id : 640653689608 Question Type : SA Calculator : None

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

Correct Marks : 4

Question Label : Short Answer Question

Consider the problem of classifying an input text as positive sentiment or negative sentiment. For example, the text “I am happy” is positive and the text “ I am a bit worried” is negative. The dictionary that is used to encode the text into a vector contains 12 words. Suppose we prefer to use a generative learning algorithm that estimates the joint probability $P(x, y)$, where $x \in \{0, 1\}^{12}$ and $y \in \{0, 1\}$. Assume that the features x_i in a sample are not independent given the label. How many parameters do we need to estimate from the given data? (Enter -1 if you think the given information is insufficient to find the answer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8191

Sub-Section Number : 7

Sub-Section Id : 640653100864

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 189 Question Id : 640653689606 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Given a training dataset with 100 data points, how many distances would we have to compute in the process of predicting the label of test-point in the k-NN algorithm with $k = 5$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Number : 190 **Question Id :** 640653689607 **Question Type :** SA **Calculator :** None

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

Correct Marks : 2

Question Label : Short Answer Question

If the proportion of points belonging to class 1 in a node is p , for what value of p is the node's entropy maximum?

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 : 8

Sub-Section Id : 640653100865

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689609 **Question Type :** COMPREHENSION **Sub Question Shuffling**

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

Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (191 to 192)

Question Label : Comprehension

Consider the following dataset with 6 samples along with the corresponding labels. Each sample has three binary features f_1, f_2 and f_3 .

sample	f_1	f_2	f_3	y
x_1	1	1	0	1
x_2	0	1	0	1
x_3	1	0	0	0
x_4	0	0	1	0
x_5	1	0	1	0
x_6	1	1	1	1

Assume that the features are conditionally independent given the label y .

Suppose the test sample is $x_{test} = [0, 1, 1]^T$.

Based on the above data answer the given subquestions.

Sub questions

Question Number : 191 Question Id : 640653689610 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

What is the estimated probability that the test point belongs to class 0 (that is, $p(y = 0|x_{test})$)?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 192 Question Id : 640653689611 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

What will be the predicted label according to the Naive Bayes decision rule?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

MLP

Section Id : 64065348511

Section Number : 13

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 24

Number of Questions to be attempted : 24

Section Marks : 50

Display Number Panel : Yes

Group All Questions : No

Enable Mark as Answered Mark for Review and Yes

Clear Response :

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 640653100866

Question Shuffling Allowed : No

Is Section Default? : null

Question Number : 193 Question Id : 640653689612 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

**THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MACHINE LEARNING PRACTICE
(COMPUTER BASED EXAM)"**

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

**(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS
REGISTERED BY YOU)**

Options :

6406532306945. ✓ YES

6406532306946. ✘ NO

Sub-Section Number : 2

Sub-Section Id : 640653100867

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 194 Question Id : 640653689626 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

You are working with a dataset containing 1000 samples, aiming to classify them using the `KNeighborsClassifier` from `scikit-learn`. After trying an initial configuration, you observe that the model seems to be overfitting, with the following accuracies:

```
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import accuracy_score

# Initial Configuration
knn = KNeighborsClassifier(n_neighbors=3)
knn.fit(X_train, y_train)
train_acc = accuracy_score(y_train, knn.predict(X_train))
val_acc = accuracy_score(y_val, knn.predict(X_val))
```

- Training accuracy: 98%
- Validation accuracy: 65%

After observing such performance of the model, Which of the following values for `n_neighbors` would be more suitable to try next?

Options :

6406532306996. ✘ 1

6406532306997. ✘ 2

6406532306998. ✓ 10

6406532306999. ✘ 500

Question Number : 195 Question Id : 640653689630 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Consider the following code segment which uses CountVectorizer on a set of documents:

```
from sklearn.feature_extraction.text import CountVectorizer

documents = [
    'apple orange banana',
    'apple apple',
    'banana orange',
    'apple banana orange orange'
]

vectorizer = CountVectorizer()
X = vectorizer.fit_transform(documents)
```

After executing the code, what will be the shape of matrix X?

Options :

6406532307012. ✓ (4, 3)

6406532307013. ✗ (3, 4)

6406532307014. ✗ (4, 4)

6406532307015. ✗ (3, 3)

Sub-Section Number : 3

Sub-Section Id : 640653100868

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 196 Question Id : 640653689613 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Assume train data (X_{train} , y_{train}) and test data (X_{test}) is given as numpy array and you build and train a LogisticRegression model. Which of the following options might possibly be the predicted class of first two samples(rows) of the test data according to the code given below?

```
>>> from sklearn.linear_model import LogisticRegression
>>> log_reg = LogisticRegression()
>>> log_reg.fit(X_train,y_train)

>>> print(log_reg.classes_)
[0,1,2] #output of above code

>>> print(log_reg.predict_proba(X_test[[0]]))
[[2.73e-45, 1.21e-51, 1.00e+00]] #output of above code

>>> print(log_reg.predict_proba(X_test[[1]]))
[[7.09e-29, 1.00e+00, 2.02e-36]] #output of above code

>>> print(log_reg.predict(X_test[0:2]))
```

Options :

6406532306947. ✖ [2.73 , 1.00]

6406532306948. ✖ [True , False]

6406532306949. ✓ [2 , 1]

6406532306950. ✖ cannot be found

Question Number : 197 Question Id : 640653689614 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the block of code given below:

```
from sklearn.metrics import confusion_matrix
y_true = ["cat", "ant", "cat", "cat", "ant", "bird"]
y_pred = ["ant", "ant", "cat", "cat", "ant", "cat"]
cm = confusion_matrix(y_true, y_pred, labels=["ant", "bird", "cat"])
print(cm)
```

Which of the following option represents the print output :

Options :

6406532306951. ✓ [[2, 0, 0],
[0, 0, 1],
[1, 0, 2]]

6406532306952. ✗ [[1, 0, 2],
[2, 0, 0],
[0, 0, 1]]

6406532306953. ✗ [[1, 0, 2],
[0, 0, 1],
[2, 0, 0]]

6406532306954. ✗ [[2, 0, 0],
[1, 0, 0],
[1, 0, 2]]

Question Number : 198 Question Id : 640653689618 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the correct output of the following code?

```
data = [[1, 3],  
        [2, 4],  
        [3, 5]]  
from sklearn.preprocessing import PolynomialFeatures  
pf = PolynomialFeatures(degree=3, interaction_only=True)  
print(pf.fit_transform(data))
```

Options :

6406532306961. ✘ [[1, 2, 3, 2, 4],
[1, 2, 4, 6, 8],
[1, 2, 5, 10, 12]]

6406532306962. ✓ [[1, 1, 3, 3],
[1, 2, 4, 8],
[1, 3, 5, 15]]

6406532306963. ✘ [[1, 1, 3, 1, 3, 9, 1, 3, 9, 27],
[1, 2, 4, 4, 8, 16, 8, 16, 32, 64],
[1, 3, 5, 9, 15, 25, 27, 45, 75, 125]]

6406532306964. ✘ [[1, 1, 2, 2, 3, 3, 4, 4],
[1, 1, 4, 4, 9, 9, 16, 16]]
[1, 1, 9, 9, 27, 27, 64, 64]

Question Number : 199 Question Id : 640653689621 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

What will following code implement?

```
from sklearn.linear_model import LogisticRegression  
logreg = LogisticRegression()  
logreg.fit(X,y)
```

where X and y are the training data.

Options :

6406532306974. ✘ It will perform regression on the given data.

6406532306975. ✘ It will generate synthetic regression data.

6406532306976. ✓ It will perform classification on the given data.

6406532306977. ✘ It will generate synthetic classification data.

Question Number : 200 Question Id : 640653689623 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Which method of classification needs more than n classifiers, where n is the number of classes?

Options :

6406532306982. ✘ OneVsRestClassifier

6406532306983. ✓ OneVsOneClassifier

6406532306984. ✘ OutputCodeClassifier

6406532306985. ✘ MultiOutputClassifier

Question Number : 201 Question Id : 640653689624 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Consider following code snippet:

```
estimator = RidgeClassifier(normalize=False, _____='auto')
pipe_ridge = make_pipeline(MinMaxScaler(),estimator)
pipe_ridge.fit(x,y)
```

If we want to apply the ridge classifier on X and choose the appropriate algorithm to train on the data, what will be the missing attribute?

Options :

6406532306986. ✘ alpha

6406532306987. ✘ tol

6406532306988. ✓ solver

6406532306989. ✘ learner

6406532306990. ✘ algo

6406532306991. ✘ algorithm

Question Number : 202 Question Id : 640653689627 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the following code?

```
from sklearn.neighbors import KNeighborsClassifier
import numpy as np

X_train = np.array([[1, 0.5], [2, 1], [3, 1.5], [4, 2], [5, 2.5],
                   [6, 3], [7, 3.5], [8, 4], [9, 4.5], [10, 5]])

y_train = [0, 0, 1, 1, 2, 2, 2, 2, 2, 2]

knn = KNeighborsClassifier(n_neighbors=7)
knn.fit(X_train, y_train)
```

Given a single test data point X_{test} , what will be the output of the following code?

```
print(knn.predict(X_test))
```

Options :

6406532307000. ✘ 0

6406532307001. ✘ 1

6406532307002. ✓ 2

6406532307003. ✘ Can not be determined without knowing the test data point.

Question Number : 203 Question Id : 640653689629 Question Type : MCQ Is Question

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

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following statements accurately describes the difference between SVC and LinearSVC in scikit-learn?

Options :

SVC supports only non-linear kernels while LinearSVC supports only linear kernels.

LinearSVC is designed specifically for linear SVM problems and does not support the use of kernels, while SVC supports both linear and non-linear kernel functions.

6406532307009. ✓

Both SVC and LinearSVC are optimized for non-linear problems and make use of kernel functions.

6406532307010. ✘

LinearSVC is a regression model while SVC is a classification model.

Sub-Section Number :

4

Sub-Section Id :

640653100869

Question Shuffling Allowed :

Yes

Is Section Default? :

null

Question Number : 204 Question Id : 640653689620 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following classifier and select the correct option.

```
estimator = SGDClassifier(loss='log',
                           penalty='l2',
                           max_iter=1,
                           warm_start=True,
                           eta0=0.01,
                           alpha=0,
                           learning_rate='constant',
                           random_state=1729)
```

Options :

6406532306970. ❌ It applies the perceptron classification with regularization.

6406532306971. ❌ It applies the perceptron classification without regularization.

6406532306972. ❌ It applies the logistic regression with regularization.

6406532306973. ✓ It applies the logistic regression without regularization.

Question Number : 205 Question Id : 640653689634 Question Type : MCQ Is Question

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

Correct Marks : 3

Question Label : Multiple Choice Question

Consider below code for a given training data:

```
from sklearn.model_selection import RandomizedSearchCV
from sklearn.ensemble import RandomForestClassifier

param_distributions = {"n_estimators" : range(3,100,2),
                      "max_depth": range(3,40,2),
                      "min_samples_split" : [3,4,5,6,7]}

RS_CV = RandomizedSearchCV(estimator=RandomForestClassifier(random_state=0),
                           param_distributions=param_distributions,
                           cv=3,
                           n_iter=12)

RS_CV.fit(X_train,y_train)
```

Which of the following option(s) are True ?

Options :

6406532307029. ✓ A total of 12 estimators will be trained, with each estimator using 3-fold crossvalidation

6406532307030. ✗ The parameter combination will be the same in every run because random_state is set to 0.

6406532307031. ✗ Given code will throw an error because all the parameters are not presented as a list

6406532307032. ✗ All of the options are incorrect

Sub-Section Number : 5

Sub-Section Id : 640653100870

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 206 Question Id : 640653689632 Question Type : MCQ Is Question

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

Correct Marks : 4

Question Label : Multiple Choice Question

According to DecisionTreeClassifier parameters which of the following option will have least fitting(underfit) for the same data.

Options :

6406532307020. ❌
DecisionTreeClassifier(max_depth = **None**,
min_samples_split= 20,
min_samples_leaf = 10)

6406532307021. ❌
DecisionTreeClassifier(max_depth = 20,
min_samples_split= 15,
min_samples_leaf = 8)

6406532307022. ✓
DecisionTreeClassifier(max_depth = 2,
min_samples_split= 30,
min_samples_leaf = 15)

6406532307023. ❌
DecisionTreeClassifier(max_depth = 5,
min_sample_split= 18,
min_sample_leaf = 12)

Sub-Section Number : 6

Sub-Section Id : 640653100871

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 207 Question Id : 640653689616 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

For the given X_train (in pandas DataFrame) below which of the following options can successfully impute the null values ?

	Weight	Education
0	NaN	School
1	56.0	High-School
2	45.0	Bachelor
3	NaN	Masters
4	40.0	School
5	40.0	High-School
6	20.0	Bachelor
7	67.0	NaN
8	20.0	School
9	35.0	NaN

Options :

```
from sklearn.pipeline import Pipeline
pipe = Pipeline([
    ("weight_si", SimpleImputer(strategy="median")),
    ("education_si", SimpleImputer(strategy="most_frequent"))
])
```

6406532306956. ✘ X_train = pipe.fit_transform(X_train)

```
from sklearn.pipeline import FeatureUnion
union = FeatureUnion([
    ("weight_si", SimpleImputer(strategy="median")),
    ("education_si", SimpleImputer(strategy="most_frequent"))
])
```

6406532306957. ✘ X_train = union.fit_transform(X_train)

```
from sklearn.impute import SimpleImputer

weight_si = SimpleImputer(strategy="median")
X_train['Weight'] = weight_si.fit_transform(X_train[['Weight']])

education_si = SimpleImputer(strategy="most_frequent")
X_train['Education']=education_si.fit_transform(X_train[['Education']])
```

6406532306958. ✓

6406532306959. ✓

```
from sklearn.compose import ColumnTransformer
from sklearn.impute import SimpleImputer

ct= ColumnTransformer(transformers= [
("weight_si",SimpleImputer(strategy="median"), ["Weight"]),
("education_si",SimpleImputer(strategy="most_frequent"),["Education"])
])

X_train= ct.fit_transform(X_train)
```

Question Number : 208 Question Id : 640653689619 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is/are true about DummyClassifier?

Options :

6406532306965. ✓ DummyClassifier makes predictions that ignore the input features.

6406532306966. ✓ DummyClassifier serves as a simple baseline to compare against other more complex classifiers.

6406532306967. ✓ The predictions of DummyClassifier typically depend on values observed in the y parameter passed to fit().

6406532306968. ✗ The predictions of DummyClassifier typically depend on values observed in the X parameter passed to fit().

6406532306969. ✗ All of these.

Question Number : 209 Question Id : 640653689622 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which solver in LogisticRegression() is a better choice for a large dataset?

Options :

6406532306978. ✓ sag

6406532306979. ✓ saga

6406532306980. ✗ lbfgs

6406532306981. ✗ liblinear

Question Number : 210 Question Id : 640653689625 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

You are analyzing a dataset with features X_{train} and targets y_{train} . After standardizing the feature set, you decide to apply the KNeighborsClassifier from scikit-learn to classify data points. You use the following code:

```
from sklearn.neighbors import KNeighborsClassifier

model = KNeighborsClassifier(n_neighbors=5,
                             weights='distance',
                             metric='minkowski', p=1)

model.fit(X_train, y_train)
```

Given the above code configuration for KNeighborsClassifier, which of the following statements are true? (Select all that apply)

Options :

6406532306992. ✗ The classifier is using the Euclidean distance metric.

6406532306993. ✗ Outliers will have a stronger influence on predictions.

The classifier is using the Manhattan distance metric and will calculate distance as the sum of absolute differences for each feature.

6406532306994. ✓

When `weights` is set to `distance`, points closer to the decision boundary will have a stronger influence on predictions than those farther away.

Question Number : 211 Question Id : 640653689628 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following Python code where you are using the SVC classifier to categorize data from a binary classification problem:

```
from sklearn.svm import SVC
from sklearn.preprocessing import StandardScaler
from sklearn.pipeline import make_pipeline

clf = make_pipeline(StandardScaler(),
                    SVC(C=1.0, kernel='rbf', gamma='scale'))

clf.fit(X_train, y_train)
prediction = clf.predict(X_test)
```

Assume that `X_train`, `y_train`, and `X_test` are training feature matrix, label vector, and test feature matrix, respectively. Which of the following statements is/are true using the code given above?

Options :

The model doesn't need scaling because SVMs are not sensitive to feature scales.

Using a pipeline that incorporates `StandardScaler` before `SVC`. This ensures that each feature is scaled before fitting the model.

6406532307005. ✓

The C parameter controls the trade-off between achieving a low error on the training data and maximizing the margin.

6406532307006. ✅ The model is using a linear kernel due to the nature of the dataset.

Question Number : 212 Question Id : 640653689635 Question Type : MSQ Is Question

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

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following are advantages of using ensemble methods in machine learning?

Options :

6406532307033. ✅ Improved model performance

6406532307034. ✅ Reduced overfitting

6406532307035. ✖ Faster model training

6406532307036. ✖ Simplicity of model interpretation

Sub-Section Number : 7

Sub-Section Id : 640653100872

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 213 Question Id : 640653689631 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following option(s) are True ?

Options :

ccp_alpha parameter helps in post-pruning and hence classifier will prioritize

6406532307016. ✘ it more than pre-pruning parameters.

In DecisionTreeClassifier if a sample (data point) meets the condition at the parent node (i.e., if it satisfies the split criteria), it goes to the left child node; Otherwise, it goes to the right child node.

6406532307017. ✓

RandomForestClassifier is better than DecisionTreeClassifier because it's Loss

6406532307018. ✘ function converges much faster while optimizing through gradient descent.

In DecisionTreeClassifier there is no predefined priority in parameters. The

6406532307019. ✓

tree will stop growing as soon as the first parameter condition is met.

Question Number : 214 Question Id : 640653689633 Question Type : MSQ Is Question

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

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Suppose In a classification problem you want to use BaggingClassifier, which of the following estimator(s) could be used as base estimator in that?

Options :

6406532307024. ✓ `tree.DecisionTreeClassifier()`

6406532307025. ✘ `svm.SVR()`

6406532307026. ✓ `linear_model.Perceptron()`

6406532307027. ✘ `cluster.KMeans()`

6406532307028. * impute.KNNImputer()

Sub-Section Number :	8
Sub-Section Id :	640653100873
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 215 Question Id : 640653689615 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

Consider given below confusion matrix code :

```
from sklearn.metrics import confusion_matrix
y_true = ["cat", "ant", "cat", "cat", "ant", "bird"]
y_pred = ["ant", "ant", "cat", "cat", "ant", "cat"]
cm = confusion_matrix(y_true, y_pred, labels=["ant", "bird", "cat"])
```

Determine the recall score for class “ant” in the given confusion_matrix?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 216 Question Id : 640653689617 Question Type : SA Calculator : None

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

Correct Marks : 2

Question Label : Short Answer Question

What will be the output of the following code:

```
from sklearn.preprocessing import MaxAbsScaler
a = [[-3],[ 0],[-2],[ 2],[-1],[-4]]
mas = MaxAbsScaler()
scaled_a = mas.fit_transform(a)
print(scaled_a.max())
```

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Business Analytics

Section Id : 64065348512

Section Number : 14

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 7

Number of Questions to be attempted : 7

Section Marks : 20

Display Number Panel : Yes

Group All Questions : No

Enable Mark as Answered Mark for Review and Clear Response : Yes

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 640653100874

Question Shuffling Allowed : No

Is Section Default? :

null

Question Number : 217 Question Id : 640653689636 Question Type : MCQ Is Question

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

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : BUSINESS ANALYTICS (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

Options :

6406532307037. ✓ YES

6406532307038. ✗ NO

Sub-Section Number : 2

Sub-Section Id : 640653100875

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 218 Question Id : 640653689637 Question Type : MCQ Is Question

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

Correct Marks : 1

Question Label : Multiple Choice Question

"Latent demand" in a demand-response curve refers to?

Options :

6406532307039.

* The area under the curve beyond the optimal price

6406532307040. * The Quantity at the optimal price

6406532307041. * The quantity at a price above the optimal price

6406532307042. ✓ None of these

Sub-Section Number : 3

Sub-Section Id : 640653100876

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 219 Question Id : 640653689638 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

In Multiple Linear Regression, the "R" represents _____ (choose all those that are applicable)

Options :

6406532307043. * Correlation between the dependent variable and all independent variables

6406532307044. ✓ Correlation between the actual and predicted values of the dependent variable

6406532307045. * Correlation between the predicted value of the dependent variable and the actual value of the independent variable

6406532307046. * Correlation between the errors

6406532307047. * Correlation between the actual and predicted value of any given independent variable

6406532307048. * Correlation between the actual value of the dependent variable and the predicted value of the errors

6406532307049. * None of these

Sub-Section Number :

Sub-Section Id :	640653100877
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653689639 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (220 to 224)

Question Label : Comprehension

For the regression output provided in Figure-1, answer the given subquestions.

Note: For all questions in this comprehension, enter your answer in decimals rounded to two decimal places. For example, if your answer is "20.3247" then enter it as "20.32"

SUMMARY OUTPUT							
Regression Statistics							
Multiple R		1					
R Square		1					
Adjusted R Square		1					
Standard Error		1.92403E-15					
Observations	A1						
ANOVA							
	df	SS	MS	F	Significance F		
Regression	A3	905.7333333	A4				
Residual		12					
Total		14					
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%
Intercept	7.10543E-15	3.48311E-15			-4.83607E-16	1.46945E-14	-4.83607E-16
X Variable 1	2	1.57612E-16			2	2	2
X Variable 2	3	2.25138E-16			3	3	3
							Upper 95.0%

Figure-1: Partial Excel Regression Model Output

Sub questions

Question Number : 220 Question Id : 640653689640 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

What is the value of "A1" in the figure?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

15

Question Number : 221 **Question Id :** 640653689641 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

How many columns are present in the sample used to develop the regression model (all the columns present in the sample)?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 222 **Question Id :** 640653689642 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the value for "A3" in the figure?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 223 **Question Id :** 640653689643 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the value for "A4" in the figure?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

452 to 453

Question Number : 224 **Question Id :** 640653689644 **Question Type :** MSQ Is Question

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

Correct Marks : 1 **Max. Selectable Options :** 0

Question Label : Multiple Select Question

Which of the following variables are "**NOT Significant**"? (choose all that is applicable)

Options :

6406532307054. ❌ X Variable 1

6406532307055. ❌ X Variable 2

6406532307056. ✓ None of these

Sub-Section Number :

Sub-Section Id : 640653100878

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689645 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (225 to 227)

Question Label : Comprehension

The demand for Diyas at a shop is as given in below figure. If the demand is expected to follow a constant elasticity curve, then answer the given subquestions

Note: For all questions in this comprehension, enter your answer in decimals rounded to two decimal places. For example, if your answer is "20.3247" then enter it as "20.32"



Sub questions

Question Number : 225 Question Id : 640653689646 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

What is the elasticity of the demand response curve?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.32 to 0.36

Question Number : 226 Question Id : 640653689647 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the demand at a price of Rs. 35?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

34.00 to 37.00

Question Number : 227 Question Id : 640653689648 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Based on the elasticity what can be the conclusion?

Options :

6406532307059. ❌ The demand is elastic

6406532307060. ✓ The demand is in-elastic

6406532307061.

* Need more information to comment on elasticity

Question Id : 640653689649 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (228 to 230)

Question Label : Comprehension

The primal formulation of a production planning problem, where the objective is to maximizing the total profit is formulated as specified below.

Maximize: $225*X1 + 200*X2 + 165*X3$

Subject to the following constraints

$13*X1 + 26*X2 + 71*X3 \leq 100012$	Constraint-1
$45*X1 + 10*X2 + 5*X3 \leq 100000$	Constraint-2
$12*X1 + 15*X2 + 34*X3 \leq 100000$	Constraint-3
$0*X1 + 45*X2 + 4*X3 \leq 100000$	Constraint-4
$X1 \geq 0$	Constraint-5
$X2 \geq 0$	Constraint-6
$X3 \geq 0$	Constraint-7

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 228 Question Id : 640653689650 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

How many constraints will be present in the dual formulation (after converting the primal to the standard form)?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 229 **Question Id :** 640653689651 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

How many decision variables will be present in the dual formulation? (after converting the primal to the standard form)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

4

Question Number : 230 **Question Id :** 640653689652 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

If the optimal solution of the primal is $X_1 = 1701$, $X_2 = 2196$, $X_3 = 293$. Then, how many decision variables will have a value of "0" in the optimal solution of the dual (after converting the primal to the standard form)?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Sub-Section Number : 6

Sub-Section Id : 640653100879

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689653 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (231 to 237)

Question Label : Comprehension

An AI system is being tested by a bank to identify the customer traffic. It is currently implemented at a single branch. The AI system uses a logistic model in the backend and its primary purpose (at the moment) is to classify customers as "Male" or "Female". In the past week, a total of 300 willing participants took part in a trial run of the AI system. Among the 300 participants, 129 were "Male" and the remaining were "Female". Among the "Male" participants, the system correctly identified 120 as "Male" and the rest were identified as "Female". Among the "Female" participants, the system correctly identified 142 as "Female" and the rest were identified as "Male".

Then answer the given subquestions

Note: For all questions in this comprehension, where ever applicable enter your answer in PERCENTAGE rounded to two decimal places without the percentage sign. For example, if your answer is "20.324%" then enter it as "20.32"

Sub questions

Question Number : 231 Question Id : 640653689654 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

If "Female" is categorised as the positive class (that is Y=1), then how many "True Positives" are present? (**Note: do not convert to percentage, give actual count**)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

142

Question Number : 232 Question Id : 640653689655 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

If "Female" is categorised as the positive class (that is Y=1), then how many "True Negatives" are present? (**Note: do not convert to percentage, give actual count**)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

120

Question Number : 233 Question Id : 640653689656 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

If "Female" is categorised as the positive class (that is Y=1), then how many "False Positives" are present? (**Note: do not convert to percentage, give actual count**)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

9

Question Number : 234 Question Id : 640653689657 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

If "Female" is categorised as the positive class (that is Y=1), then how many "False Negatives" are present? (**Note: do not convert to percentage, give actual count**)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

29

Question Number : 235 Question Id : 640653689658 Question Type : SA Calculator : None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the accuracy of the AI system?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

86.00 to 88.00

Question Number : 236 **Question Id :** 640653689659 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the “Precision” of the AI system for predicting “Male” class?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

80.00 to 82.00

Question Number : 237 **Question Id :** 640653689660 **Question Type :** SA **Calculator :** None

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

Correct Marks : 1

Question Label : Short Answer Question

What is the “Recall” of the AI system for predicting the “Female” class?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

82.00 to 84.00

System Commands

Section Id :	64065348513
Section Number :	15
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	14
Number of Questions to be attempted :	14
Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100880
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 238 Question Id : 640653689661 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : SYSTEM COMMANDS (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

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

REGISTERED BY YOU)

Options :

6406532307072. ✓ YES

6406532307073. ✘ NO

Sub-Section Number : 2

Sub-Section Id : 640653100881

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 239 Question Id : 640653689662 Question Type : SA Calculator : None

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

Correct Marks : 7

Question Label : Short Answer Question

```
$ pwd  
/home/pinky  
$ cd /var  
$ pwd  
/var  
$ for i in {1..11}; do cd -; done
```

What is the output to the command `pwd` at the end of the execution of the given script?

Hint: `cd -` will change the current working directory to the previous current working directory.

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : Yes

Text Areas : PlainText

Possible Answers :

/home/pinky

Sub-Section Number : 3

Sub-Section Id :	640653100882
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653689663 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (240 to 244)

Question Label : Comprehension

```
mkdir dir1 dir2

echo 0 > file1

ln file1 file1_h1
ln -s file1 file1_s1
ln -s file1 dir1/file1_s2

cd dir1
mv ../* .
echo 1 > ../file1
echo 2 > file1
ln -s ../file1 file1_s3
ln -s file1 file1_s4
cd ..

cp file1 dir2/file1
cp file1_s1 dir2/file1_s5
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 240 Question Id : 640653689664 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

What will be the output of
cat ./dir1/file1 after
the execution of the given script?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 241 **Question Id :** 640653689665 **Question Type :** SA **Calculator :** None

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

Correct Marks : 3

Question Label : Short Answer Question

What will be the output of

```
echo 3 > file1_h1; cat ./file1
```

after the execution of the

given script?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 242 **Question Id :** 640653689666 **Question Type :** SA **Calculator :** None

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

Correct Marks : 3

Question Label : Short Answer Question

What will be the output of

```
echo 4 > ./dir1/file1_s1; cat ./file1
```

after the execution of the given script?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 243 **Question Id :** 640653689667 **Question Type :** SA **Calculator :** None

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

Correct Marks : 3

Question Label : Short Answer Question

What will be the output of

```
echo 5 > ./dir1/file1_s3; cat ./dir1/file1
```

after the execution of the given script?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 244 **Question Id :** 640653689668 **Question Type :** SA **Calculator :** None

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

Correct Marks : 3

Question Label : Short Answer Question

What will be the output of

```
echo 6 > ./dir1/file1_s3; cat ./file1
```

after the execution of the given script?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Sub-Section Number : 4

Sub-Section Id : 640653100883

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 245 **Question Id :** 640653689669 **Question Type :** MCQ **Is Question**

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

Correct Marks : 6

Question Label : Multiple Choice Question

```
$ cat data  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
$ awk '  
{  
    arr1[NR % 2] += $1  
    arr2[$1 % 2] += $1  
}  
END {  
    for (i in arr1) {  
        print i, arr1[i] - arr2[i]  
    }  
}  
' data
```

What will be output of last command in the given console command?

Options :

6406532307080. ✘ 0 0
0 1

6406532307081. ✘ 1 0
0 1

6406532307082. ✘ 1 1
0 0

6406532307083. ✘ 1 1
0 1

6406532307084. ✓ 1 0
0 0

Question Number : 246 Question Id : 640653689672 Question Type : MCQ Is Question

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

Time : 0

Correct Marks : 6

Question Label : Multiple Choice Question

```
[ a = a ] && [ 1 -ne 2 ]
v1=$?
[[ a = a && 1 -ne 2 ]]
v2=$?
echo $((v1 + v2))
```

What will be the output from the given script?

Options :

6406532307090. ✓ 0

6406532307091. ✗ 1

6406532307092. ✗ 2

6406532307093. ✗ -1

Sub-Section Number : 5

Sub-Section Id : 640653100884

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 247 Question Id : 640653689670 Question Type : SA Calculator : None

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

Correct Marks : 8

Question Label : Short Answer Question

What will be the output of the given command?

```
seq 100 |  
    sed 's/\(\[[[:digit:]]\)\)\1/\1/g' |  
    sort -n |  
    uniq |  
    wc -l
```

Hints:

1. `seq 100` will generate 1 to 100 in each line
2. `-n` option in `sort` command sort numerically
3. `uniq` command will remove the **adjacent** duplicate lines

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

90

Sub-Section Number : 6

Sub-Section Id : 640653100885

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 248 **Question Id :** 640653689671 **Question Type :** MCQ **Is Question**

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

Correct Marks : 8

Question Label : Multiple Choice Question

```

awk '
/^[^0-9].*[0-9].*$/ {
    arr[FILENAME]=arr[FILENAME]:::$0
}
END {
    for (i in arr) {
        print i, arr[i]
    }
}
' *

```

What does the given AWK command print?

Hint: FILENAME is a default variable have the value of filename

Options :

6406532307086. ✘ The filename and contains all the lines in the file that starts with numbers

6406532307087. ✘ The filename and contains all the lines in the file that ends with numbers

6406532307088. ✘ The filename and contains all the lines in the file that starts and ends with numbers

6406532307089. ✓ The filename and contains all the lines that has a number in it but not at the beginning

Sub-Section Number : 7

Sub-Section Id : 640653100886

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 249 Question Id : 640653689673 Question Type : MSQ Is Question

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

Correct Marks : 6 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following sed commands will show only line 6th and 8th line of a index.txt file.

Options :

6406532307094. ❌ sed -e '6p' -e '8p' index.txt

6406532307095. ✅ sed -n '8p;6p' index.txt

6406532307096. ✅ sed -n -e '6p' -e '8p' index.txt

6406532307097. ❌ sed -n '6,8p' index.txt

Sub-Section Number : 8

Sub-Section Id : 640653100887

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 250 Question Id : 640653689674 Question Type : MCQ Is Question

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

Correct Marks : 7

Question Label : Multiple Choice Question

What will the following command do upon execution.

```
find /home/users/Documents/ -name '*,.doc' | grep -v '102421' | xargs -I{} mv {} /home/Documents/OfficeFiles
```

Options :

Move all files with doc extension from `Documents` folder whose content matches with 6406532307098. ❌ 102421 to `OfficeFiles` folder

Move all files with doc extension from `Documents` folder whose content does not match 6406532307099. ❌ with 102421 to `OfficeFiles` folder

Move all files with doc extension from `Documents` folder whose name matches with 6406532307100. ❌ 102421 to `OfficeFiles` folder

Move all files with doc extension from `Documents` folder whose name does not match 6406532307101. ✓ with 102421 to `OfficeFiles` folder

Sub-Section Number : 9
Sub-Section Id : 640653100888
Question Shuffling Allowed : Yes
Is Section Default? : null

Question Number : 251 Question Id : 640653689675 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

A html file index.html has following general format. Identify the correct command which will extract content from `<p>` tags (that is the content between `<p>` and `</p>` and **not the lines with tags**).

```
<!-- Case 1 -->
<html>
  <head>
    <title>Alphabets</title>
  </head>

  <body>
    <p>
      abcd
    </p>
  </body>
</html>
```

HINT:

```
$ cat data
START_REGION1
START_REGION7
a
b
END_REGION7
END_REGION1
START_REGION2
START_REGION7
1
2
END_REGION7
END_REGION2
$ sed -n '/START_REGION7/,/END_REGION7/p' data
START_REGION7
a
b
END_REGION7
START_REGION7
1
2
END_REGION7
$ sed -n '/START_REGION1/,/END_REGION1/ {/START_REGION7/,/END_REGION7/p}'
data
START_REGION7
a
b
END_REGION7
```

Options :

6406532307102. ❌ sed -n "< p > / , < \ p > / p" index.html

6406532307103. ✓ sed -n "< p > / , < \ p > / { < p > / ! { / < \ p > / ! p } } " index.html

6406532307104. ❌ sed -n "< p > / , < \ p > / { < p > / ! , < \ p > / ! p } " index.html

6406532307105. ✓ awk '< p > / , < \ p > / ' index.html|grep -v "<"

Question Number : 252 Question Id : 640653689676 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

A html file index.html has following general format. Identify the correct command which will extract content from `<p>` tags (that is the content between `<p>` and `</p>`).

```
<!-- Case 2 -->
<html>
  <head>
    <title>Alphabets</title>
  </head>

  <body>
    <p>efgh
    </p>
    <p>
      ijk</p>
    </body>
  </html>
```

HINT:

```
$ cat data
START_REGION1
START_REGION7
a
b
END_REGION7
END_REGION1
START_REGION2
START_REGION7
1
2
END_REGION7
END_REGION2
$ sed -n '/START_REGION7/,/END_REGION7/p' data
START_REGION7
a
b
END_REGION7
START_REGION7
1
2
END_REGION7
$ sed -n '/START_REGION1/,/END_REGION1/ {/START_REGION7/,/END_REGION7/p}'
data
START_REGION7
a
b
END_REGION7
```

Options :

6406532307106. ✓ sed -n "/<p>/ , /<\/p>/p" index.html | sed -E 's#/</?p>##g'

6406532307107. ❌ sed -n "/<p>/ , /<\/p>/{/<p>/! {/<\/p>/! p}}" index.html

6406532307108. ❌ sed -n "/<p>/ , /<\/p>/{/<p>/! , /<\/p>/! p}" index.html

6406532307109. ✓ awk '/<p>/ , /<\/p>/' index.html | sed -E 's#/</?p>##g'

Question Number : 253 Question Id : 640653689677 Question Type : MSQ Is Question

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

Time : 0

Correct Marks : 8 Max. Selectable Options : 0

Question Label : Multiple Select Question

A html file index.html has following general format. Identify the correct command which will extract content from `<p>` tags (that is the content between `<p>` and `</p>`).

```
<!-- Case 3 -->
<html>
  <head>
    <title>Alphabets</title>
  </head>

  <body>
    <p>mnop</p>
  </body>
</html>
```

HINT:

```
$ cat data
START_REGION1
START_REGION7
a
b
END_REGION7
END_REGION1
START_REGION2
START_REGION7
1
2
END_REGION7
END_REGION2
$ sed -n '/START_REGION7/,/END_REGION7/p' data
START_REGION7
a
b
END_REGION7
START_REGION7
1
2
END_REGION7
$ sed -n '/START_REGION1/,/END_REGION1/ {/START_REGION7/,/END_REGION7/p}'
data
START_REGION7
a
b
END_REGION7
```

Options :

6406532307110. ✓ sed -n "<?p>.*<?p>/p" index.html | sed -E 's#<?p>##g'

6406532307111. ✗ sed -n "<?p>/,<?p>/{<?p>!/ {<?p>!/ p}}" index.html

6406532307112. ✗ sed -n "<?p>/,<?p>/{<?p>!/,<?p>!/ p}" index.html

6406532307113. ✓ awk '<?p>.*<?p>/' index.html | sed -E 's#<?p>##g'

Sub-Section Id : 640653100889

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 254 Question Id : 640653689678 Question Type : SA Calculator : None

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

Correct Marks : 6

Question Label : Short Answer Question

How many background processes will be running after 5 seconds after execution of the script?

```
sleep 1 &
echo two &
echo three && echo four || echo five && echo six
sleep 6 &
sleep 2 &
sleep 7 &
sleep 12 &
```

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 : 640653100890

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 255 Question Id : 640653689679 Question Type : MSQ Is Question

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

Correct Marks : 7 Max. Selectable Options : 0

Question Label : Multiple Select Question

The below text is the file mycpuinfo

```
processor      : 0
vendor_id     : GenuineIntel
cpu family    : 6
model         : 126
model name    : Intel(R) Core(TM) i5-1035G1 CPU @ 1.00GHz
stepping       : 5
microcode     : 0xb0
cpu MHz        : 1200.000
cache size    : 6144 KB
physical id   : 0
siblings       : 8
core id        : 0
cpu cores     : 4
apicid         : 0
initial apicid : 0
fpu            : yes
fpu_exception  : yes
cpuid level   : 27
wp             : yes
```

```
flags      : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca
cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx
pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl
xtopology nonstop_tsc cpuid aperfmpf tsc_known_freq pni pclmulqdq dtes64
monitor ds_cpl vmx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1
sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand
lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single ssbd ibrs ibpb
stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase
tsc_adjust sgx bmi1 avx2 smep bmi2 erms invpcid avx512f avx512dq rdseed
adx smap avx512ifma clflushopt intel_pt avx512cd sha_ni avx512bw avx512vl
xsaveopt xsavec xgetbv1 xsaves split_lock_detect dtherm ida arat pln pts
hwp hwp_notify hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku
ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
avx512_vpocntdq rdpid sgx_lc fsrm md_clear flush_l1d arch_capabilities
vmx flags    : vnmi preemption_timer posted_intr invvpid ept_x_only ept_ad
ept_lgb flexpriority apicv tsc_offset vtpr mtf vapid ept vpid
unrestricted_guest vapid_reg vid ple pml ept_mode_based_exec tsc_scaling
bugs       : spectre_v1 spectre_v2 spec_store_bypass swapgs itlb_multihit
srbds mmio_stale_data
```

```
bogomips   : 2380.80
clflush size   : 64
cache_alignment   : 64
address sizes   : 39 bits physical, 48 bits virtual
power management:
```

Select the command that retrieves only the model name of the cpu. The output from the command should be "Intel(R) Core(TM) i5-1035G1 CPU @ 1.00GHz"

Note: The option -o will print only the matches not the entire line.

Options :

6406532307115. ❌ grep model_name mycpuinfo

6406532307116. ❌ grep -o "model_name" mycpuinfo

6406532307117. ✓ grep "model name" mycpuinfo | egrep -o ".*" | sed 's/://g'

6406532307118. ✓ grep "model[]name" mycpuinfo | egrep -o ".*" | cut -d: -f2-

