QUIZ -2

PYQ

NEW!

JAN - 2021

- CT - 1
- Statistics
- English -1
- Maths -1

Foundation level Quiz 2 Jan 24 exam 2021 QP1

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 :	Foundation level Quiz 2 Jan 24 exam 2021 QP1
Duration :	240
Number of Questions :	65
Total Marks :	200

English

Number of Questions :	25
Section Marks :	50

Mark As Answered Required? : Yes

Question Number : 1

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the phrasal pause(s) given in the following sentences are true or false.

Stars/ twinkle/ planets/ do not//

Options :

- ✖ TRUE
- ✔ FALSE

Question Number : 2

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the phrasal pause(s) given in the following sentences are true or false.

No/thanks// I would like to/but I have some assignments to do//

Options :

- ✔ TRUE
- ✖ FALSE

Question Number : 3

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the phrasal pause(s) given in the following sentences are true or false.

Where/ there is a will/ there is a way//

Options :

- ✔ TRUE
- ✖ FALSE

Question Number : 4

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the phrasal pause(s) given in the following sentences are true or false.

I have a dream/that one day/ sons of former slaves and sons of former slave owners /shall sit together//

Options :

- ✖ TRUE
- ✔ FALSE

Question Number : 5

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the phrasal pause(s) given in the following sentences are true or false.

Solomon Grunty/ Born on/ Monday/
Christened on/ Tuesday / Married on/ Wednesday /
Sick on/ Thursday / Worse on/ Friday /
Died on/ Saturday / Buried on/ Sunday /
That's the end/ of Solomon Grundy //

Options :

- ✖ TRUE
- ✔ FALSE

Question Number : 6

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the given meaning against each idiom is true or false.

The best of both worlds

Meaning: Enjoy the benefit of two different opportunities at the same time.

Options :

• ✔ TRUE

• ✖ FALSE

Question Number : 7

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the given meaning against each idiom is true or false.

A hot potato

Meaning: The right answer.

Options :

• ✖ TRUE

• ✔ FALSE

Question Number : 8

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the given meaning against each idiom is true or false.

Hit the nail on the head

Meaning: A controversial issue.

Options :

• ✖ TRUE

• ✔ FALSE

Question Number : 9

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the given meaning against each idiom is true or false.

Add insult to injury

Meaning: Make a situation worse.

Options :

• ✔ TRUE

• ✖ FALSE

Question Number : 10

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the given meaning against each idiom is true or false.

Once in a blue moon

Meaning: An event that happens rarely.

Options :

• ✔ TRUE

• ✖ FALSE

Question Number : 11

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the following are true or false.

Prepositions combined with nouns make prepositional phrases.

Options :

• ✔ TRUE

• ✖ FALSE

Question Number : 12

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the following are true or false.

Objects precede the verb in an English sentence.

Options :

- ✖ TRUE
- ✔ FALSE

Question Number : 13

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the following are true or false.

Some sentences don’t have a verb.

Options :

- ✖ TRUE
- ✔ FALSE

Question Number : 14

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the following are true or false.

In the sentence, ‘Get out of this room’, ‘you’ is the subject.

Options :

- ✔ TRUE
- ✖ FALSE

Question Number : 15

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the following are true or false.

Adjectives are words that describe the qualities of nouns.

Options :

• ✔ TRUE

• ✖ FALSE

Question Number : 16

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the following are true or false.

Determiners follow a noun phrase.

Options :

• ✖ TRUE

• ✔ FALSE

Question Number : 17

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the following are true or false.

In the agreement in English sentences, gender plays a critical role.

Options :

• ✖ TRUE

• ✔ FALSE

Question Number : 18

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the following are true or false.

The sentence, ‘Some news are so boring’ is grammatically right.

Options :

• ✖ TRUE

• ✔ FALSE

Question Number : 19

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the following are true or false.

Plural subject requires plural marking on verb.

Options :

• ✔ TRUE

• ✖ FALSE

Question Number : 20

Correct Marks : 2

Question Label : Multiple Choice Question

State whether the following are true or false.

If a verb is transitive, it doesn't require objects.

Options :

• ✖ TRUE

• ✔ FALSE

Question Number : 21

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the correct form of the verb that agrees with the subject.

Annie and her brothers _____ at school.

Options :

• ✖ Is

• ✔ Are

Question Number : 22

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the correct form of the verb that agrees with the subject.

Either my mother or my father _____ coming to the meeting.

Options :

• ✔ Is

• ✖ Are

Question Number : 23

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the correct form of the verb that agrees with the subject.

The dog or the cats _____ outside.

Options :

• ✖ Is

• ✔ Are

Question Number : 24

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the correct form of the verb that agrees with the subject.

Swamy and Ram _____ want to see that movie.

Options :

• ✖ Doesn’t

• ✔ Don’t

Question Number : 25

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the correct form of the verb that agrees with the subject.

The man with all the birds _____ on my street.

Options :

• ✖ Live

• ✔ Lives

Mathematics for Data Science I

Number of Questions :	9
Section Marks :	50
Mark As Answered Required? :	Yes

Question Number : 26

Correct Marks : 0

Question Label : Multiple Choice Question

Set of instructions

Mathematics for Data Science - 1

- 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.
- Notations:
  - $\mathbb{R}$= Set of real numbers
  - $\mathbb{Q}$= Set of rational numbers
  - $\mathbb{Z}$= Set of integers
  - $\mathbb{N}$= Set of natural numbers
- The set of natural numbers includes 0.
- Standard acronyms:
  - m - metres
  - cm - centimetres
  - kg - kilograms
  - kcal- kilocalorie

Options :

- ✔ Useful data has been mentioned above
- ✖ This data attachment is just for a reference & not for an evaluation

Question Number : 27

Correct Marks : 4

Question Label : Multiple Choice Question

Which of the following is a factor of $x^4 + 4$?

Options :

. ✖ $x^2 - 3x + 3$

. ✖ $x^3 - 1$

. ✔ $x^2 + 2 + 2x$

. ✖ $x^2 - 2$

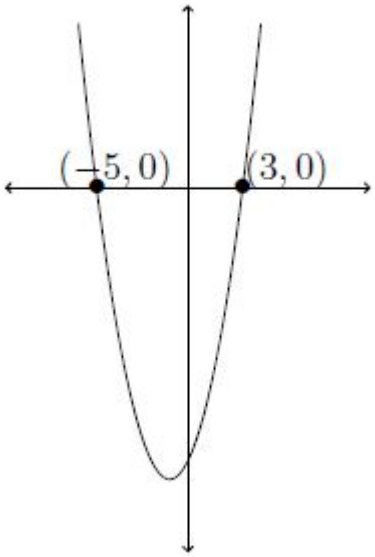
Question Number : 28

Correct Marks : 4

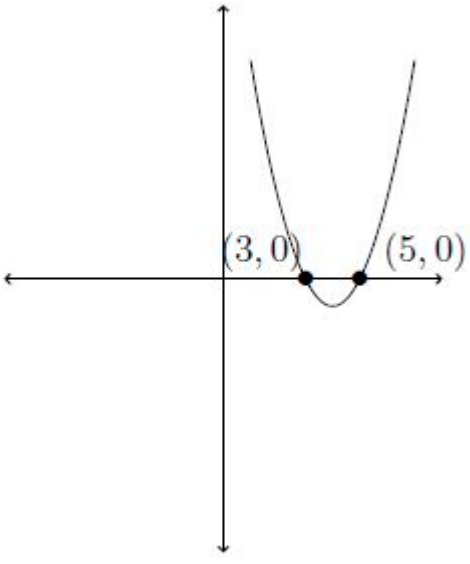
Question Label : Multiple Choice Question

Let $r(x)$ be a polynomial function which is obtained as the remainder after dividing the polynomial $p(x) = x^4 - 4x^3 + x^2 - 7$ by the polynomial $q(x) = x^3 - 2$. Choose the correct option which represents the polynomial $r(x)$ most appropriately.

Options :

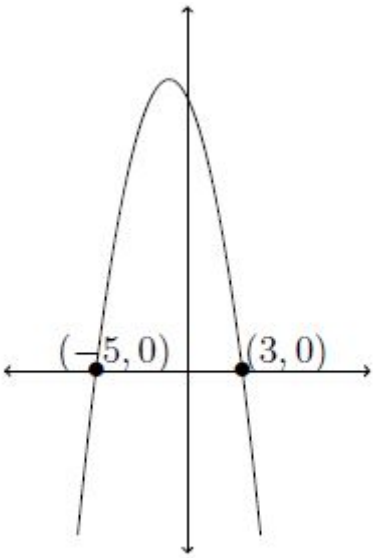


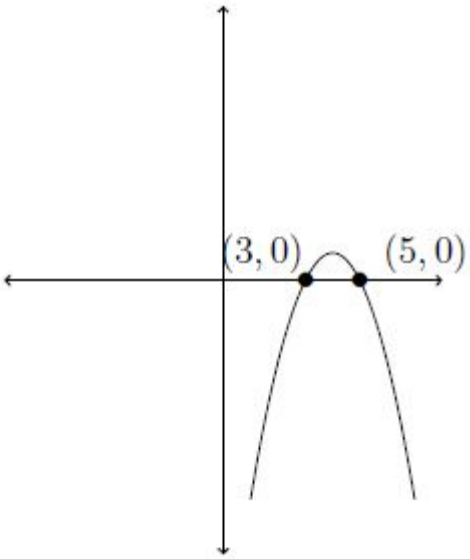
. ✔



. ✖

. ✖





Question Number : 29

Correct Marks : 4

Question Label : Short Answer Question

If a, b and c are the roots of the polynomial $x^3 + 11x - 7$ and sum of the roots is 0, then find the value of $a^3 + b^3 + c^3$.

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

21

Question Number : 30

Correct Marks : 6

Question Label : Multiple Select Question

Parvathi launches her new company in the year 2010, which makes yearly profit in lakhs as the quadratic function $P(x)$ for first 10 years since the launch, where x is the number of years after since 2010 (i.e., $x = 0$ denotes the year 2010, $x = 1$ denotes the year 2011, and so on). Let the loss be represented as $-ve$ of profit. Suppose in the year 2012 and 2014 the company had made neither profit nor loss, and in the year 2020 the company has been making profit. Which of the following options are correct?

Options :

• ✔ From the given information, the profit made by the company in the year 2010 cannot be determined.

• ✖ From the given information, the profit made by the company in the year 2010 can be determined precisely and it is exactly ₹8 lakhs.

• ✔ In the first ten years, the company made a loss in the year 2013 only.

• ✖ In the first ten years, the company never made a loss.

• ✖ From the given information, the year(s) for which the company made loss(es) cannot be determined.

• ✖ From the given information, the loss made by the company in the year 2013 can be determined precisely and it is exactly ₹1 lakh.

• ✔ From the given information, the loss made by the company in the year 2013 cannot be determined.

Question Number : 31

Correct Marks : 5

Question Label : Multiple Select Question

Which of the following is/are true?

Options :

. ✖ There is at least one polynomial $p(x)$ of degree two such that $p(1) = 3$ and $p(1) = 21$.

. ✖ Degree of the polynomial $p(x) = 0$ is 0.

. ✔ If $p(x)$ is a polynomial of degree n then $a - b$ divides $p(a) - p(b)$, where a and b are distinct integers.

. ✔ There are infinitely many polynomials $p(x)$ of degree two such that $p(1) = 0$ and $p(5) = 0$.

Question Number : 32

Correct Marks : 5

Question Label : Multiple Select Question

Consider the following curves C_1 and C_2 :

C_1: $y = x^2 - 3x + 4$

C_2: $y = x^2 - 3x - 4$

Let C_3 be the straight line which is parallel to X-axis and whose y-intercept is $\frac{7}{4}$. Define

- S_1 to be the set of x-intercepts of the curve C_1
- S_2 to be the set of points of intersection of C_1 and C_3
- S_3 to be the set of points of intersection of C_2 and C_3

Which of the following options are correct?

Options :

. ✖ Cardinality of $S_1 \cup S_2$ is 0.

. ✔ Cardinality of $S_1 \cup S_2$ is 1.

. ✖ Cardinality of $S_1 \cup S_2$ is 2.

. ✔ Cardinality of $S_1 \cup S_3$ is 2.

. ✖ Cardinality of $S_1 \cup S_3$ is 1.

. ✖ Cardinality of $S_1 \cup S_3$ is 0.

Question Number : 33

Correct Marks : 6

Question Label : Multiple Choice Question

Tamil Nadu government has planned to construct a road from Chennai to Bangalore, so that it passes near to Chittor, Vellore and Kuppam. They estimated that the road should look like a curve of the form $y = f(x) = x^3 + 2x^2 + mx + c$, with respect to some fixed coordinate axes. With respect to the same axes, the points $(0, 0), (-1, 0)$ and $(1, 2)$ represent the places Chittor, Vellore and Kuppam, respectively. They want to minimize the distance of the proposed road from the cities using SSE method. What will be the values of m and c, so that they will have the best possible road satisfying the previous conditions?

Options :

. ✖ $m = 0$ and $c = \frac{2}{3}$

. ✔ $m = 0$ and $c = -\frac{2}{3}$

. ✖ $m = -1$ and $c = \frac{2}{3}$

. ✖ $m = -1$ and $c = -\frac{2}{3}$

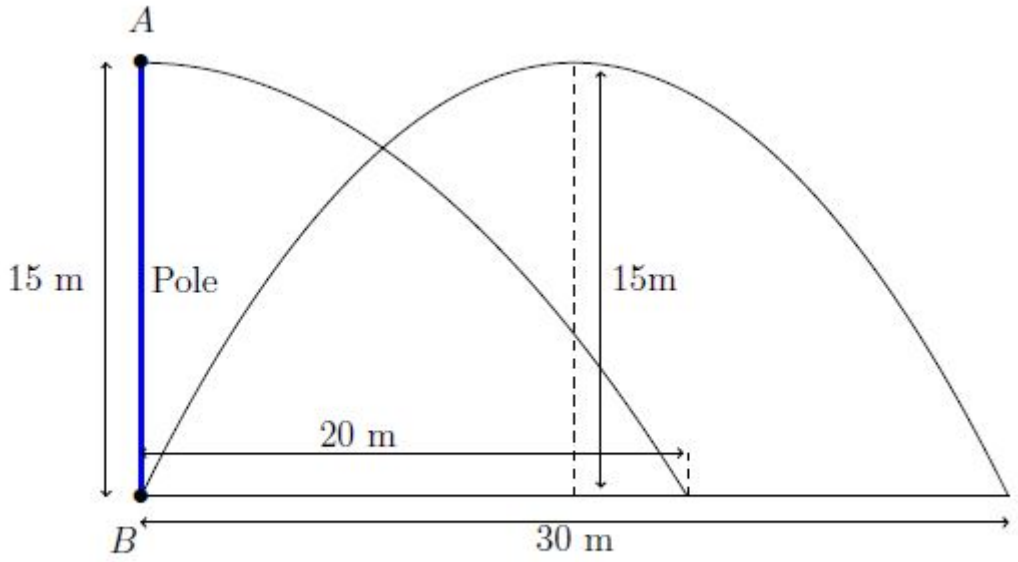
Sub Question Shuffling Allowed : No Group Comprehension Questions : No

Question Numbers : (34 to 36)

Question Label : Comprehension

A firework is projected from the lowest corner of a pole of height 15m into the air and reaches a maximum height which is same as the height of the pole. The path of the firework is parabolic and it lands 30m from the launch site *B* (as shown in the figure). A ball is thrown from the top of the

pole which follows the parabolic path (whose vertex is at the point of the throw (*A*)) and lands at a distance of 20m from the ground (as shown in the figure). Taking *B* as the origin, horizontal direction as the *X* axis, vertical direction as the *Y* axis, and unit length to be 1m, answer the given subquestions.



Figure

Sub questions

Question Number : 34

Correct Marks : 5

Question Label : Multiple Choice Question

Find out the equation of the curve followed by the firework.

Options :

✖ $y - 15 = -\frac{1}{15}x^2$

✔ $y - 15 = -\frac{1}{15}(x - 15)^2$

✖ $y - 30 = -\frac{1}{30}(x - 30)^2$

✖ $y - 30 = -\frac{1}{30}x^2$

Question Number : 35

Correct Marks : 5

Question Label : Multiple Choice Question

Find out the equation of the curve followed by the ball.

Options :

. ✖ $y-15=-\frac{15}{20}(x-15)^2$

. ✖ $y-20=-\frac{1}{20^2}x^2$

. ✖ $y-20=-\frac{15}{20^2}x^2$

. ✔ $y-15=-\frac{15}{20^2}x^2$

Question Number : 36

Correct Marks : 6

Question Label : Multiple Choice Question

If both the tasks are performed at the same time, find out the horizontal distance of the meeting point from the pole, assuming they are meeting at a point as shown in the figure.

Options :

. ✖ 10m

. ✖ $\frac{45}{7}\text{m}$

. ✔ $\frac{60}{7}\text{m}$

. ✖ $\frac{35\sqrt{2}}{7}\text{m}$

Computationl Thinking

Number of Questions : 14

Section Marks : 50

Mark As Answered Required? : Yes

Question Number : 37

Correct Marks : 0

Question Label : Multiple Choice Question

Scores

RowNo	Name	Gender	DateOfBirth	CityTown	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

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

Options :

- ✔ Useful data has been mentioned above
- ✖ This data attachment is just for a reference & not for an evaluation

Sub Question Shuffling Allowed : No Group Comprehension Questions : No

Question Numbers : (38 to 43)

Question Label : Comprehension

Let $\mathbf{L}$ be a non-empty list of integers, and $\mathbf{D}$ be a non-empty dictionary whose keys and values are integers.

Select the correct answer with the appropriate datatype for the given subquestions.

Sub questions

Question Number : 38

Correct Marks : 0.5

Question Label : Multiple Choice Question

$\mathrm{first}(\mathbf{L})$

Options :

- ✖ Undefined
- ✖ Invalid key
- ✖ Boolean
- ✖ List
- ✔ Integer

Question Number : 39

Correct Marks : 0.5

Question Label : Multiple Choice Question

$\mathrm{rest}(\mathbf{L})$

Options :

- ✖ Undefined
- ✖ Invalid key
- ✖ Boolean
- ✔ List
- ✖ Integer

Question Number : 40

Correct Marks : 0.5

Question Label : Multiple Choice Question

$\mathbf{keys(L)}$

Options :

- ✔ Undefined
- ✖ Invalid key
- ✖ Boolean
- ✖ List
- ✖ Integer

Question Number : 41

Correct Marks : 0.5

Question Label : Multiple Choice Question

$\mathbf{isKey(D,\ 10)}$

Options :

- ✖ Undefined
- ✖ Invalid key
- ✔ Boolean
- ✖ List
- ✖ Integer

Question Number : 42

Correct Marks : 0.5

Question Label : Multiple Choice Question

$\mathbf{init(D)}$

Options :

- ✔ Undefined
- ✖ Invalid key
- ✖ Boolean
- ✖ List
- ✖ Integer

Question Number : 43

Correct Marks : 0.5

Question Label : Multiple Choice Question

$\mathbf{D}[\text{“IITM”}]$

Options :

- ✖ Undefined
- ✔ Invalid key
- ✖ Boolean
- ✖ List
- ✖ Integer

Question Number : 44

Correct Marks : 4

Question Label : Multiple Choice Question

A word is said to be *perfect* if no letter is repeated. Let **isPerfect** be a procedure that takes a row **X** in the “Words” table as input and decides whether the word is perfect. Choose the correct implementation of the procedure **isPerfect**.

Options :

- ✖

```
Procedure isPerfect(X)
    C = [ ]
    i = 1
    while (i ≤ X.LetterCount) {
        A = i^th letter in X.Word
        if (member(C, A)) {
            return (False)
        }
        else{
            return (True)
        }
        i = i + 1
    }
End isPerfect
```

- ✔

```
Procedure isPerfect(X)
    C = [ ]
    i = 1
    while (i ≤ X.LetterCount) {
        A = i^th letter in X.Word
        if (member(C, A)) {
            return (False)
        }
        else{
            C = C ++ [A]
        }
        i = i + 1
    }
    return (True)
End isPerfect
```

```
Procedure isPerfect(X)
    C = [ ]
    i = 1
    while (i ≤ X.LetterCount) {
        A = i^th letter in X.Word
        if (member(C, A)) {
            C = C ++ [A]
        }
        else{
            return (False)
        }
        i = i + 1
    }
    return (True)
End isPerfect
```

- ✖
- ✖

```
Procedure isPerfect(X)
    C = [ ]
    i = 1
    while (i ≤ X.LetterCount) {
        A = i^th letter in X.Word
        if (member(C, A)) {
            return (True)
        }
        else{
            C = C ++ [A]
        }
        i = i + 1
    }
    return (False)
End isPerfect
```

Question Number : 45

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Words" table. What will the value of variable **A** represent at the end of the execution? [Assume that $A < B < \cdots < Z$ and, $A = a$, $B = b$, $\ldots$, $Z = z$.]

```
A = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    if (checkWord(X)) {
        A = A + 1
    }
    Move X to Table 2
}

Procedure checkWord(X)
    D = First letter of X.Word
    i = 2, C = [D]
    while (i ≤ X.LetterCount) {
        D = i^th letter of X.Word
        if (last(C) > D) {
            return (False)
        }
        C = C ++ [D]
        i = i + 1
    }
    return (True)
End checkWord
```

Options :

- ✔ Number of words where the letters are in non-decreasing order
- ✖ Number of words where the letters are in non-increasing order
- ✖ Number of words where the letters are in increasing order
- ✖ Number of words where the letters are in decreasing order

Question Number : 46

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Scores" table. What will the value of **A** represent at the end of the execution? [Note: Given a date of birth **B**, the procedure **month**(**B**) outputs the month of **B**. For example, **month**("Jan 06") is "Jan".]

```
DC = { }, DG = { }, DM = { }
while (Table 1 has more rows) {
    Read the first row X in Table 1
    DC = updateDictByField(DC, X.Mathematics, X.CityTown)
    DG = updateDictByField(DG, X.Mathematics, X.Gender)
    DM = updateDictByField(DM, X.Mathematics, month(X.DateOfBirth))
    Move X to Table 2
}
A = 0
while (Table 2 has more rows) {
    Read the first row X in Table 2
    Y = X.Mathematics
    if (Y == DC[X.CityTown] and Y == DG[X.Gender]
        and Y == DM[month(X.DateOfBirth)]) {
        A = A + 1
    }
    Move X to Table 1
}

Procedure updateDictByField(D, value, F)
    if (not isKey(D, F)) {
        D[F] = value
    }
    else {
        if (D[F] > value) {
            D[F] = value
        }
    }
End updateDictByField
```

Options :

- ✖ Number of students who scored highest Mathematics marks of the city, gender and month of birth

• ✖ Number of students who scored highest Mathematics marks of the city, gender or month of birth

• ✔ Number of students who scored lowest Mathematics marks of the city, gender and month of birth

• ✖ Number of students who scored lowest Mathematics marks of the city, gender or month of birth

Question Number : 47

Correct Marks : 4

Question Label : Multiple Choice Question

The details of persons tested for Covid 19 for the year 2020 is recorded in the dictionary **Covid** as follows: for each city **X**, for each patient **Y** in **X**, and for a day **Z** on which the test is taken for **Y**, **Covid**[X][Y][Z] = *Positive*/*Negative*. Date of test is recorded from 0 to 365 (0 : Jan 1, . . . , 365 : Dec 31).

Government classifies the city to be in containment zone based on pseudocode given below. Choose the correct option to classify a city as a containment zone.

```
containmentZone = { }
foreach X in keys(Covid) {
    Patients = 0
    foreach Y in keys(Covid[X]) {
        A = 0
        foreach Z in keys(Covid[X][Y]) {
            if (A < Z) {
                A = Z
            }
        }
        if (Covid[X][Y][A] == "Positive") {
            Patients = Patients + 1
        }
    }
    containmentZone[X] = "Yes"
    if (Patients < 50) {
        containmentZone[X] = "No"
    }
}
```

Options :

• ✖ When there is a patient with latest test result as positive

• ✖ When the number of patients with a test result as positive is greater than or equal to 50

- ✔ When the number of patients with the latest test result as positive is greater than or equal to 50
- ✖ When the number of patients with the latest test result as positive is less than 50
- ✖ None of these

Question Number : 48

Correct Marks : 6

Question Label : Multiple Choice Question

Let DX be a dictionary where the keys and values are integers. The procedure **invert()** constructs a dictionary DY from DX as follows: (i) for each key A in DX, DX[A] is a key in DY, and (ii) for each key B in DY, DY[B] is a list of integers such that for each A in the list, DX[A] = B. Choose the correct implementation of the procedure **invert()**.

Options :

- ✖
```
Procedure invert(DX)
    DY = { }
    foreach A in keys(DX) {
        B = DX[A]
        if (isKey(DY, B)) {
            DY[B] = [A]
        }
        DY[B] = DY[B] ++ [A]
    }
    return (DY)
End invert
```

- ✖
```
Procedure invert(DX)
    DY = { }
    foreach A in keys(DX) {
        B = DX[A]
        if (not isKey(DY, B)) {
            DY[B] = [ ]
        }
        else {
            DY[B] = DY[B] ++ [A]
        }
    }
    return (DY)
End invert
```

```
Procedure invert(DX)
    DY = { }
    foreach A in keys(DX) {
        B = DX[A]
        DY[B] = DY[B] ++ [A]
    }
    return (DY)
End invert
```

✗

```
Procedure invert(DX)
    DY = { }
    foreach A in keys(DX) {
        B = DX[A]
        if (not isKey(DY, B)) {
            DY[B] = [ ]
        }
        DY[B] = DY[B] ++ [A]
    }
    return (DY)
End invert
```

✓

Question Number : 49

Correct Marks : 2

Question Label : Multiple Select Question

Let **L** be a list. Choose the correct statement(s) about the list **L**.

Options :

✗ All the elements in **L** must be of the same datatype.

✗ **init**(**L**) returns a single element.

✓ A list can be appended to a list

✗ For any value **X**, **member**(**L**, **X**) returns **X** if **X** is in **L**.

. ✔ $\mathbf{length(init(L)) = length(rest(L))}$

Question Number : 50

Correct Marks : 2

Question Label : Multiple Select Question

Let $\mathbf{D}$ be a dictionary. Choose the correct statement(s) about the dictionary $\mathbf{D}$.

Options :

. ✖ For each key $\mathbf{X}$ in $\mathbf{D}$, $\mathbf{D[X]}$ is a distinct value

. ✔ $\mathbf{keys(D)}$ has no duplicate elements

. ✖ All the keys of $\mathbf{D}$ must be of the same datatype

. ✖ We can obtain the key from the value of the key stored in $\mathbf{D}$

. ✔ The values of $\mathbf{D}$ can be of different datatypes

Question Number : 51

Correct Marks : 2

Question Label : Multiple Select Question

Let $\mathbf{D}$ be a dictionary whose keys are strings and values are integers. For each key $\mathbf{A}$ in $\mathbf{D}$, $\mathbf{D[A]}$ is the letter count of $\mathbf{A}$. Choose the correct statement(s) about the dictionary $\mathbf{D}$.

Options :

. ✖ For two different keys $\mathbf{X}$ and $\mathbf{Y}$ in $\mathbf{D}$, $\mathbf{D[X]} \neq \mathbf{D[Y]}$

. ✔ $\mathbf{isKey(D, 1)}$ is False

. ✔ $\mathbf{keys(D)}$ returns a list of strings

. ✗ $\mathbf{D}[\text{“Hello”}] = 7$

Question Number : 52

Correct Marks : 2

Question Label : Multiple Select Question

Let $\mathbf{D}$ be a dictionary. Choose the correct way(s) to initialize $\mathbf{D}$.

Options :

. ✗ $\mathbf{D} = [\,]$

. ✓ $\mathbf{D} = \{\,\}$

. ✗ $\mathbf{D} = [\text{“City”}: \text{“Chennai”}, \text{“Pin”}: 600036]$

. ✓ $\mathbf{D} = \{\text{“City”}: \text{“Chennai”}, \text{“Pin”}: 600036\}$

. ✗ $\mathbf{D} = \{\text{“City”}, \text{“Chennai”}\}$

Question Number : 53

Correct Marks : 4

Question Label : Multiple Select Question

Let **LA** be a sorted list of integers in ascending order, and **X** be an integer. The procedure **insert**() inserts the element **X** into the list **LA** such that the list remains sorted. But the procedure may have mistakes. Identify all such mistakes (if any).

```
1   Procedure insert(LA, X)
2       LB = { }
3       flag = True
4       foreach A in LA {
5           if (flag) {
6               if (X <= A) {
7                   LB = LB ++ [A]
8                   flag = False
9               }
10          }
11          LB = LB ++ [A]
12      }
13      if (not flag) {
14          LB = LB ++ [X]
15      }
16      return (LB)
17  End insert
```

Options :

. ✔ Line 2: **LB** should be initialized as an empty list

. ✖ Line 5: Conditional expression should use "not" operator

. ✔ Line 7: **X** should be appended to the list **LB**

. ✖ Line 11: **X** should be appended to the list **LB**

. ✔ Line 13: Incorrect conditional expression

. ✖ Line 16: **LA** should be returned

Sub Question Shuffling Allowed : No Group Comprehension Questions : No

Question Numbers : (54 to 57)

Question Label : Comprehension

Choose the correct statement(s) based on the following pseudocode in the given subquestions

```
LA = [[1, 2, 3, 4], [2, 3, 4], [3, 4, 5], [4, 5], [5], [ ]]
LB = [ ]
LC = [ ]
foreach A in LA {
    LB = [A] ++ LB
    foreach B in A {
        LC = LC ++ [B]
    }
}
```

Sub questions

Question Number : 54

Correct Marks : 1

Question Label : Multiple Choice Question

$\text{length}(\text{LA}) == \text{length}(\text{LB})$

Options :

- ✔ TRUE
- ✖ FALSE

Question Number : 55

Correct Marks : 1

Question Label : Multiple Choice Question

$\text{last}(\text{LB}) == [\,]$

Options :

- ✖ TRUE
- ✔ FALSE

Question Number : 56

Correct Marks : 1

Question Label : Multiple Choice Question

$\text{length}(\text{LC}) == 14$

Options :

• ✖ TRUE

• ✔ FALSE

Question Number : 57

Correct Marks : 1

Question Label : Multiple Choice Question

Each element of **LB** is a non-empty list

Options :

• ✖ TRUE

• ✔ FALSE

Sub Question Shuffling Allowed : No Group Comprehension Questions : No

Question Numbers : (58 to 59)

Question Label : Comprehension

Answer the given subquestions.

Sub questions

Question Number : 58

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Scores" table. At the end of the execution, **D** captures the following information: for each city **A**, and for each subject **B**, **D**[**A**][**B**] stores the highest marks of a student in the subject **B** from the city **A**. Choose the correct code fragment to complete the pseudocode.

```
D = { }
L = ["Physics", "Chemistry", "Mathematics"]
while (Table 1 has more rows) {
    Read the first row X in Table 1
    **********************
    *     Fill the code     *
    **********************
    Move X to Table 2
}
```

Options :

```
foreach B in L {
    if (D[X.CityTown][A] < X.B) {
        D[X.CityTown][B] = X.B
    }
}
```

✖

```
if (not isKey(D, X.CityTown)) {
    foreach B in L {
        D[X.CityTown][B] = X.B
    }
}
foreach B in L {
    if (D[X.CityTown][B] > X.B) {
        D[X.CityTown][B] = X.B
    }
}
```

✖

✔

```
if (not isKey(D, X.CityTown)) {
    D[X.CityTown] = { }
    foreach B in L {
        D[X.CityTown][B] = X.B
    }
}
else {
    foreach B in L {
        if (D[X.CityTown][B] < X.B) {
            D[X.CityTown][B] = X.B
        }
    }
}
```

```
    if (not isKey(D, X.CityTown)) {
        D[X.CityTown] = { }
    }
    else {
        foreach B in L {
            if (D[X.CityTown][B] < X.B) {
                D[X.CityTown][B] = X.B
            }
        }
    }
```

Question Number : 59

Correct Marks : 5

Question Label : Multiple Select Question

The following pseudocode is executed using the "Scores" table. Consider the dictionary **D** computed in the previous question. At the end of the execution, **C** captures the number of students who are city toppers in all subjects. Choose the correct code fragment(s) to complete the pseudocode.

```
C = 0
L = ["Physics", "Chemistry", "Mathematics"]
while (Table 2 has more rows) {
    Read the first row X in Table 2
    **********************
    *     Fill the code     *
    **********************
    Move X to Table 1
}
```

Options :

```
flag = False
foreach A in L {
    if (D[X.CityTown][A] > X.A) {
        flag = True
    }
}
if (flag) {
    C = C + 1
}
```

✖

```
flag = True
foreach A in L {
    if (D[X.CityTown][A] > X.A) {
        flag = False
    }
}
if (flag) {
    C = C + 1
}
```

✔

✔

```
B = 0
foreach A in L {
    if (D[X.CityTown][A] > X.A) {
        B = B + 1
    }
}
if (B == 0) {
    C = C + 1
}
```

```
B = 0
foreach A in L {
    if (D[X.CityTown][A] > X.A) {
        B = B + 1
    }
}
if (B == 3) {
    C = C + 1
}
```

Statistics for Data Science I

Number of Questions :	17
Section Marks :	50
Mark As Answered Required? :	Yes

Question Number : 60

Correct Marks : 5

Question Label : Short Answer Question

During Covid-19, the number of orders for food received on an online food delivery application over 7 days for a city is shown in Table Q2.1. The revenue generated from these orders is also tabulated. Find the correlation coefficient for the data.(Correct upto 2 decimal points)

Number of orders (in thousands)	Revenue (In lakh Rupees)
12	21
8	13
8	15
7	14
9	16
8	14
11	12

Table Q2.1

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.49 to 0.55

Question Number : 61

Correct Marks : 5

Question Label : Short Answer Question

In how many ways can Rakhi paint the rectangle as shown in Figure Q2.2?

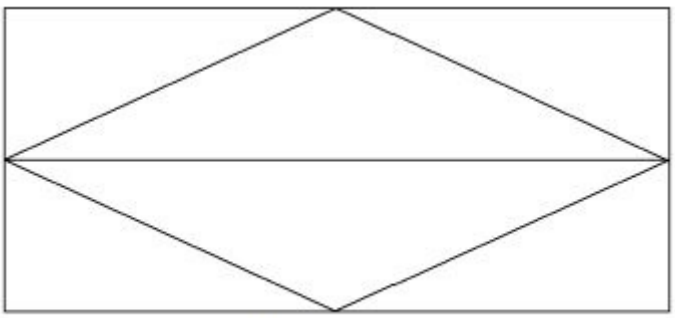


Figure Q2.2

Following conditions should be satisfied:

1) Each triangle can be painted using one of the four colors- red, green, blue and yellow.

2) No two adjacent triangles should have same colour.

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

972

Sub Question Shuffling Allowed : No Group Comprehension Questions : No

Question Numbers : (62 to 63)

Question Label : Comprehension

Use the information given below to answer the subquestions.

An interview panel of a company comprises of four male and three female selectors. They have to sit on 7 chairs arranged in a row.

Sub questions

Question Number : 62

Correct Marks : 2

Question Label : Short Answer Question

What is the probability that not all of the three female selectors sit together?(Correct upto 2 decimal points)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.83 to 0.88

Question Number : 63

Correct Marks : 2

Question Label : Short Answer Question

If they have to choose a Head from among themselves, what is the probability that the randomly chosen Head is a male?(Correct upto 2 decimal points)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.55 to 0.59

Question Number : 64

Correct Marks : 2

Question Label : Multiple Choice Question

The 100% stacked bar chart shown in Figure Q2.1, indicates the status of loan approval for 1200 candidates who applied for a loan. From Figure Q2.1, identify the correct options.

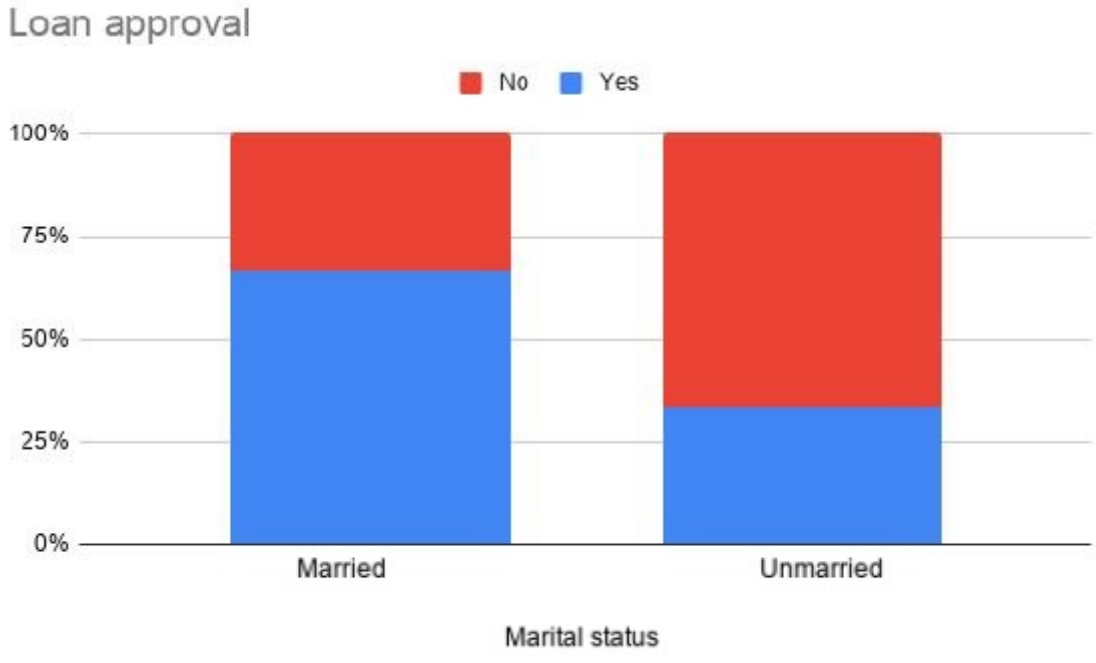


Figure Q2.1

Options :

- ✔ Marital status is associated with the loan approval.
- ✖ Marital status is not associated with the loan approval.
- ✖ The stacked bar chart is not plotted properly.
- ✖ Cannot say about any association from the above bar chart.

Question Number : 65

Correct Marks : 2

Question Label : Multiple Choice Question

There are 13 students standing in a row. Among these 13 students Raghu and Rajat are identical twins and Kajal and Janani are identical twins. How many ways can they be arranged in a row?

Options :

- ✖ $\frac{13!}{4!}$
- ✖ $\frac{13!}{2!\times 2!}$
- ✔ $13!$
- ✖ None of these

Question Number : 66

Correct Marks : 2

Question Label : Multiple Choice Question

Ricky and Sadie play a game by tossing a fair coin. If the outcome is a head then Ricky earns one point and if the outcome is a tail then Sadie earns one point. What is the probability that after 10 tosses of the coin, both have same points?

Options :

- ✖ $\frac{252}{2^5}$
- ✔

$\frac{252}{2^{10}}$

. ✖ $\frac{512}{2^{10}}$

. ✖ $\frac{512}{2^5}$

Question Number : 67

Correct Marks : 3

Question Label : Multiple Choice Question

A blindfolded person is asked to form the word `VICTORY' from 26 distinct alphabet blocks placed in front of her. She picks out seven blocks and arranges them in a sequence. What is the probability that she forms the word "VICTORY"? Blindfolded person knows that all the letters in the word "VICTORY" are distinct.

Options :

. ✖ $\frac{26!}{19!}$

. ✔ $\frac{19!}{26!}$

. ✖ $\frac{1}{26^7}$

. ✖ None of these

Question Number : 68

Correct Marks : 3

Question Label : Multiple Choice Question

A local football maker makes 75 balls which should be bought by 4 teams. Each team will buy a

minimum of 15 balls. What is the total numbers of ways in which these 75 balls can be bought by 4 teams?

Options :

- ✔ $^{18}C_3$
- ✖ $^{75}C_3$
- ✖ $^{15}C_3$
- ✖ $^{78}C_3$

Question Number : 69

Correct Marks : 3

Question Label : Short Answer Question

In the Statistics paper of a qualifier exam, there are five multiple choice questions each of which has four possible answer options. Find the number of ways a student will not get all the answers correct.

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1023

Question Number : 70

Correct Marks : 3

Question Label : Short Answer Question

Nitya wants to download some books online. There are 10 books available to download from that website. Among those 10 books, one book is on Machine Learning and one book is of Python. She does not want to download the Machine learning book unless the Python book is also downloaded. In how many ways can she download the three books from the website?

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

92

Question Number : 71

Correct Marks : 3

Question Label : Short Answer Question

In a tennis competition involving both boys and girls, every player has to play exactly one match with every other player. It was found that 10 games are such that both the players are girls and in 105 games both players are boys. What is the number of games in which one player is a girl and the opponent is a boy?

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

75

Question Number : 72

Correct Marks : 3

Question Label : Short Answer Question

A manned submersible dives down into the sea to discover rare minerals in the depths of the sea. One kilogram of a sample contains 16 minerals out of which four are rare. Scientists extract eight minerals randomly from this one kilogram sample. What is the probability that the extracted minerals will contain at least two rare minerals?(Correct upto one decimal place)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.7 to 0.8

Question Number : 73

Correct Marks : 3

Question Label : Short Answer Question

India, Pakistan, Sri Lanka and Bangladesh are competing for the Asia cup. A survey from the previous performances shows that India and Pakistan have equal chances of winning while Sri Lanka is twice as likely to win the Asia cup as Bangladesh. Probability that either India or Sri Lanka will win the Asia cup is 0.48. Weather forecast shows that there is a 10% chance that the tournament will get cancelled due to rain. What is the probability that Sri Lanka will win the Asia cup?(Correct upto 2 decimal points)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.12

Question Number : 74

Correct Marks : 3

Question Label : Short Answer Question

Find the number of words that can be formed from five distinct alphabets taking two or more alphabets at a time. Repetition of alphabets is not allowed. (Words can be meaningless)

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

320

Question Number : 75

Correct Marks : 2

Question Label : Short Answer Question

If $\frac{1}{6!} - \frac{1}{7!} = \frac{x}{8!}$. Find x.

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

48

Question Number : 76

Correct Marks : 2

Question Label : Short Answer Question

How many numbers are there between 999 to 10000 having at least one of their digits as 5?

NOTE: Enter your answer to the nearest integer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3168

Question Number : 77

Correct Marks : 2

Question Label : Multiple Select Question

Find the number of ways in which the twelve letters in the word "PERMUTATIONS" can be arranged (More than one option could be correct).

Options :

. ✔ $\frac{12!}{2!}$

. ✔ $6 \times 11 \times 10!$

. ✖ $12!$

. ✖ None of these