Question Paper Preview

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 :	IITM Online Foundation Qualifier Q1QP3 22 Nov 2020
Duration :	210
Number of Questions :	46
Total Marks :	200

English

Number of Questions :	5
Section Marks :	50

Mark As Answered Required? : Yes

Question Numbers : (1 to 5)

Question Label : Comprehension

READING

Read the poem and answer the given subquestions.

Stopping by the Woods by Robert Frost

Whose woods these are I think I know.
His house is in the village though;
He will not see me stopping here
To watch his woods fill up with snow.

My little horse must think it queer
To stop without a farmhouse near
Between the woods and frozen lake
The darkest evening of the year.

He gives his harness bells a shake
To ask if there is some mistake.
The only other sound's the sweep
Of easy wind and downy flake.

The woods are lovely, dark and deep,
But I have promises to keep,
And miles to go before I sleep,
And miles to go before I sleep.

Sub questions

Question Number : 1

Correct Marks : 1

Question Label : Multiple Choice Question

Where has the speaker stopped his horse?

Options :

1. ✖ Near a mountain

2. ✖ In a village

3. ✔ In a forest

4. ✖ Near a farmhouse

Question Number : 2

Correct Marks : 1

Question Label : Multiple Choice Question

Why does the speaker stop by the woods?

Options :

1. ✖ His horse was tired

2. ✖ The speaker was sleepy

3. ✖ It was dark

4. ✔ To observe the snowfall and the natural beauty

Question Number : 3

Correct Marks : 1

Question Label : Multiple Choice Question

What are the sounds that the speaker hears in the woods?

Options :

1. ✖ Sweeping wind

2. ✖ Falling snowflakes

3. ✖ Horse's harness bell

4. ✔ All of these

Question Number : 4

Correct Marks : 1

Question Label : Multiple Choice Question

Why didn't the speaker stay longer to enjoy the natural beauty of woods?

Options :

1. ✖ It was dark

2. ✖ The horse was tired

3. ✖ There was no farmhouse nearby

4. ✔ He had duties and responsibilities to be fulfilled

Question Number : 5

Correct Marks : 1

Question Label : Multiple Choice Question

The last two lines in the poem symbolize a short span of human life and the duties and responsibilities that he has to fulfil before his life ends.

Options :

1. ✔ TRUE

2. ✖ FALSE

Question Numbers : (6 to 10)

Question Label : Comprehension

READING

Read the passage and state whether the given subquestions are true or false.

(Source : Spark Notes)

The Call of the Wild by Jack London

Buck, a powerful dog, half St. Bernard and half sheepdog, lives on Judge Miller's estate in California's Santa Clara Valley. He leads a comfortable life there, but it comes to an end when men discover gold in the Klondike region of Canada and a great demand arises for strong dogs to pull

sleds. Buck is kidnapped by a gardener on the Miller estate and sold to dog traders, who teach Buck to obey by beating him with a club and, subsequently, ship him north to the Klondike.

Arriving in the chilly North, Buck is amazed by the cruelty he sees around him. As soon as another dog from his ship, Curly, gets off the boat, a pack of huskies violently attacks and kills her. Watching her death, Buck vows never to let the same fate befall him. Buck becomes the property of Francois and Perrault, two mail carriers working for the Canadian government, and begins to adjust to life as a sledge dog. He recovers the instincts of his wild ancestors: he learns to fight, scavenge for food, and sleep beneath the snow on winter nights. At the same time, he develops a fierce rivalry with Spitz, the lead dog in the team. One of their fights is broken up when a pack of wild dogs invades the camp, but Buck begins to undercut Spitz's authority, and eventually the two dogs become involved in a major fight. Buck kills Spitz and takes his place as the lead dog.

With Buck at the head of the team, Francois and Perrault's sled makes record time. However, the men soon turn the team over to a mail carrier who forces the dogs to carry much heavier loads. In the midst of a particularly arduous trip, one of the dogs becomes ill, and eventually, the driver has to shoot him. At the end of this journey, the dogs are exhausted, and the mail carrier sells them to a group of American gold hunters—Hal, Charles, and Mercedes.

Sub questions

Question Number : 6

Correct Marks : 1

Question Label : Multiple Choice Question

Buck has a hard time soon after men discover gold in the Klondike region of Canada.

Options :

1. ✔ TRUE

2. ✖ FALSE

Question Number : 7

Correct Marks : 1

Question Label : Multiple Choice Question

Curly kills a pack of huskies.

Options :

1. ✖ TRUE

2. ✔ FALSE

Question Number : 8

Correct Marks : 1

Question Label : Multiple Choice Question

Spitz is a sledge dog.

Options :

1. ✔ TRUE

2. ✖ FALSE

Question Number : 9

Correct Marks : 1

Question Label : Multiple Choice Question

During a trip, the driver kills Spitz.

Options :

1. ✖ TRUE

2. ✔ FALSE

Question Number : 10

Correct Marks : 1

Question Label : Multiple Choice Question

Buck's wild nature was tampered by civilization.

Options :

1. ✔ TRUE

2. ✖ FALSE

Question Numbers : (11 to 20)

Question Label : Comprehension

LISTENING

I Know Why the Caged Birds Sing

Listen to the audio sample and answer the given subquestions.

885_388245_0_1984128_e300a1.mp3

Sub questions

Question Number : 11

Correct Marks : 1

Question Label : Multiple Choice Question

The caged bird is a _____ of the oppressed.

Options :

1. ✔ Connotation

2. ✖ Denotation

Question Number : 12

Correct Marks : 1

Question Label : Multiple Choice Question

What does the caged bird singing reveal about him?

Options :

1. ✖ He is angry.

2. ✖ He is brown.

3. ✔ He is unhappy and wants to be free.

4. ✖ He is lonely.

Question Number : 13

Correct Marks : 1

Question Label : Multiple Choice Question

'Pre' in the word 'previous' is a prefix.

Options :

1. ✖ TRUE

2. ✔ FALSE

Question Number : 14

Correct Marks : 1

Question Label : Multiple Choice Question

The poet is Maya Angelou.

Options :

1. ✔ TRUE

2. ✖ FALSE

Question Number : 15

Correct Marks : 1

Question Label : Multiple Choice Question

The caged bird knows (deep-down) that he was created to be free.

Options :

1. ✔ TRUE

2. ✖ FALSE

Question Number : 16

Correct Marks : 1

Question Label : Multiple Choice Question

The poem is a reflection of the author's feelings about her dreams.

Options :

1. ✔ TRUE

2. ✖ FALSE

Question Number : 17

Correct Marks : 1

Question Label : Multiple Choice Question

The author's voice was not heard in the wide (white) world.

Options :

1. ✔ TRUE

2. ✖ FALSE

Question Number : 18

Correct Marks : 1

Question Label : Multiple Choice Question

The literary device used in the poem is onomatopoeia.

Options :

1. ✖ TRUE

2. ✔ FALSE

Question Number : 19

Correct Marks : 1

Question Label : Multiple Choice Question

The bird preying hungrily on the worm is referred to as _____.

Options :

1. ✖ Deworming

2. ✔ Devouring

Question Number : 20

Correct Marks : 1

Question Label : Multiple Choice Question

Low spirit from the loss of hope or courage is known as _____.

Options :

1. ✖ Devour

2. ✔ Despondence

3. ✖ Racism

4. ✖ Oppression

Question Numbers : (21 to 35)

Question Label : Comprehension

GRAMMAR AND USAGE

Fill in the blanks from the options given in the subquestions.

Call of the Wild by Jack London

(Reference: Spark Notes)

Buck's new masters are 1. _____ and out of place in the wilderness. They overload the sledge, beat the dogs, and plan poorly. Halfway through their journey, they begin to run out 2._____ food. While the humans bicker, the dogs begin to starve, and the weaker animals soon die. 3. _____ an original team of fourteen, only five 4._____ still alive when they limp into John Thornton's camp, still some distance from their destination. Thornton 5._____ them that the ice 6._____which they are travelling is melting and that they may fall through it. Hal dismisses these warnings and tries to get going immediately. The other dogs begin to move, 7. _____ Buck refuses. When Hal begins to beat him, Thornton intervenes, knocking a knife from Hal's hand and cutting Buck 8. _____. Hal curses Thornton and starts the sledge again, but before they have gone a quarter of a mile, the ice breaks 9. _____, swallowing both the humans and the dogs.

Thornton becomes Buck's master, and Buck's devotion to him is total. He saves Thornton from drowning in a river, attacks a man who tries to start a fight with Thornton in a bar, and, most remarkably, wins a $1,600 wager for his new master by pulling a sledge carrying a thousand-pound load. But Buck's love for Thornton is mixed 10. _____ a growing attraction to the wild, and he feels as if he is being called 11. _____ from civilization and into the 12._____. This feeling grows stronger when he accompanies Thornton and his friends in search of a lost mine hidden deep 13. _____ the Canadian forest.

While the men search for gold, Buck ranges far afield, befriending wolves and hunting bears and moose. He always returns to Thornton in the end, until one day, he 14. _____ back to camp to find that Yeehat Indians have attacked and killed his master. Buck attacks the Indians, killing several and scattering the rest, and then heads off into the wild, where he becomes the leader of a pack of wolves. He becomes a legendary figure, a Ghost Dog, fathering countless cubs and inspiring fear in the Yeehats—but every year he returns to the place where Thornton died, to mourn his master before returning to his life in the 15_____.

Sub questions

Question Number : 21

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 1 _____.

Options :

1. ✖ unexperienced

2. ✔ inexperienced

3. ✖ aexperienced

Question Number : 22

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 2 _____.

Options :

1. ✖ from

2. ✔ of

Question Number : 23

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 3 _____.

Options :

1. ✔ of

2. ✖ off

Question Number : 24

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 4 _____.

Options :

1. ✖ is

2. ✔ are

Question Number : 25

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 5 _____.

Options :

1. ✖ warn

2. ✔ warns

Question Number : 26

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 6 _____.

Options :

1. ✖ in

2. ✔ over

3. ✖ against

Question Number : 27

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 7 _____.

Options :

1. ✖ still

2. ✖ yet

3. ✔ but

Question Number : 28

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 8 _____.

Options :

1. ✔ loose

2. ✖ tight

3. ✖ over

Question Number : 29

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 9 _____.

Options :

1. ✖ out

2. ✔ open

3. ✖ down

Question Number : 30

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 10 _____.

Options :

1. ✖ out of

2. ✖ inside

3. ✔ with

Question Number : 31

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 11 _____.

Options :

1. ✖ out

2. ✖ for

3. ✔ away

Question Number : 32

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 12 _____.

Options :

1. ✖ wilder

2. ✖ widest

3. ✔ wilderness

Question Number : 33

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 13 _____.

Options :

1. ✔ in

2. ✖ into

Question Number : 34

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 14 _____.

Options :

1. ✖ come

2. ✔ comes

Question Number : 35

Correct Marks : 1

Question Label : Multiple Choice Question

Enter the correct answer for blank 15 _____.

Options :

1. ✔ wild

2. ✖ wilder

3. ✖ wildest

Question Numbers : (36 to 50)

Question Label : Comprehension

SOUNDS, WORDS AND SENTENCES

Choose the right answer from the options given in the subquestions.

Sub questions

Question Number : 36

Correct Marks : 1

Question Label : Multiple Choice Question

How many consonant sounds are there in the word 'spark'?

Options :

1. ✖ 1

2. ✖ 2

3. ✖ 3

4. ✔ 4

Question Number : 37

Correct Marks : 1

Question Label : Multiple Choice Question

/p/, /t/, /k/ are known as _____ sounds.

Options :

1. ✖ dental

2. ✔ stop

Question Number : 38

Correct Marks : 1

Question Label : Multiple Choice Question

A cluster of three consonant sounds is possible only in the initial position of a word.

Options :

1. ✖ TRUE

2. ✔ FALSE

Question Number : 39

Correct Marks : 1

Question Label : Multiple Choice Question

/p/ in the word 'span' is an aspirated sound.

Options :

1. ✖ TRUE

2. ✔ FALSE

Question Number : 40

Correct Marks : 1

Question Label : Multiple Choice Question

Comprehension begins with first understanding the sounds.

Options :

1. ✔ TRUE

2. ✖ FALSE

Question Number : 41

Correct Marks : 1

Question Label : Multiple Choice Question

More obstruction to the exhaling flow of air leads to the production of vowel sounds.

Options :

1. ✖ TRUE

2. ✔ FALSE

Question Number : 42

Correct Marks : 1

Question Label : Multiple Choice Question

There are 24 consonant sounds in English.

Options :

1. ✔ TRUE

2. ✖ FALSE

Question Number : 43

Correct Marks : 1

Question Label : Multiple Choice Question

In the word 'clips', plural marking sound is:

Options :

1. ✖ /z/

2. ✔ /s/

Question Number : 44

Correct Marks : 1

Question Label : Multiple Choice Question

Select the correct one.

Options :

1. ✔ bliss- /blis/

2. ✖ bliss- /bliis/

Question Number : 45

Correct Marks : 1

Question Label : Multiple Choice Question

In the phrase, 'The Teacher', 'the' is a _____, and 'teacher' a noun.

Options :

1. ✖ Verb

2. ✔ Determiner

3. ✖ Adjective

4. ✖ Adverb

Question Number : 46

Correct Marks : 1

Question Label : Multiple Choice Question

He _____ like ice-creams.

Options :

1. ✖ do not

2. ✔ does not

Question Number : 47

Correct Marks : 1

Question Label : Multiple Choice Question

In this sentence, 'He hates Pizza', the word 'hates' has a _____ marker on it.

Options :

1. ✔ Singular

2. ✖ Plural

Question Number : 48

Correct Marks : 1

Question Label : Multiple Choice Question

'She liked to run.' The verb 'liked' has _____ tense marker on it.

Options :

1. ✖ Present

2. ✔ Past

Question Number : 49

Correct Marks : 1

Question Label : Multiple Choice Question

In the agreement in English sentences, number and _____ play a critical role.

Options :

1. ✖ Gender

2. ✔ Person

Question Number : 50

Correct Marks : 1

Question Label : Multiple Choice Question

'Get out of my class' is a request.

Options :

1. ✖ TRUE

2. ✔ FALSE

Computational thinking

Number of Questions : 14

Section Marks : 50

Mark As Answered Required? : Yes

Question Number : 51

Correct Marks : 0

Question Label : Multiple Choice Question

Library

RowNo	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

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 :

1. ✔ Useful Data has been mentioned above.

2. ✖ This data attachment is just for a reference & not for an evaluation.

Question Number : 52

Correct Marks : 3

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 execution?

```
A = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    if (X.Gender == "F" and X.CityTown == "Vellore") {
        A = A + X.Physics
    }
    Move X to Table 2
}
```

Options :

1. ✖ Sum of Physics marks of students from Vellore
2. ✔ Sum of Physics marks of female students from Vellore
3. ✖ Sum of Physics marks of female students
4. ✖ Sum of Physics marks of female students not from Vellore

Question Number : 53

Correct Marks : 3

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Words" table. At the end of the execution, **A** captures the maximum letter count of a word which is not a verb. Choose the correct code fragment to complete the pseudocode.

```
A = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    **********************
    *      Fill the code      *
    **********************
    Move X to Table 2
}
```

Options :

1. ✖

```
if (X.PartOfSpeech == "Verb" and X.LetterCount > A) {
    A = X.LetterCount
}
```

```
    if (X.PartOfSpeech ≠ "Verb" and X.LetterCount < A) {
        A = X.LetterCount
    }
```

2. ✖

```
    if (X.PartOfSpeech == "Verb" and X.LetterCount < A) {
        A = X.LetterCount
    }
```

3. ✖

```
    if (X.PartOfSpeech ≠ "Verb" and X.LetterCount > A) {
        A = X.LetterCount
    }
```

4. ✔

Question Number : 54

Correct Marks : 3

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Scores" table. At the end of the execution, **A** captures the second highest mark in Chemistry. Assume that the variable **Max** holds the value of the highest mark in Chemistry. Choose the correct code fragment to complete the pseudocode.

```
A = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    **********************
    *      Fill the code      *
    **********************
    Move the row X to Table 2
}
```

Options :

```
    if (X.Chemistry > A) {
        A = X.Chemistry
    }
```

1. ✖

```
if (X.Chemistry > Max and X.Chemistry < A) {
    A = X.Chemistry
}
```

2. ✖

```
if (X.Chemistry < Max and X.Chemistry > A) {
    A = X.Chemistry
}
```

3. ✔

```
if (X.Chemistry < Max) {
    A = X.Chemistry
}
```

4. ✖

Question Number : 55

Correct Marks : 3

Question Label : Multiple Choice Question

Let **X** be a row in the "Library" table. Let **isShortNonfiction** be a procedure to find whether the book in the row **X** is a nonfiction book with number of pages at most 300. Choose the correct code fragment to complete the pseudocode.

```
Procedure isShortNonfiction (X)
    **********************
    *      Fill the code      *
    **********************
End isShortNonfiction
```

Options :

```
if (X.Genre == "Nonfiction") {
    return (True)
}
else {
    return (False)
}
```

1. ✖

2. ✖

```
if (X.Genre == "Nonfiction" and X.Pages <= 300) {
    return (False)
}
else {
    return (True)
}
```

```
if (X.Genre == "Nonfiction" and X.Pages <= 300) {
    return (True)
}
else {
    return (False)
}
```

3. ✔

```
if (X.Genre == "Nonfiction" or X.Pages <= 300) {
    return (True)
}
else {
    return (False)
}
```

4. ✖

Question Number : 56

Correct Marks : 3

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?

```
A = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    B = True
    if (X.Physics ≥ 65) {
        B = False
    }
    if (X.Chemistry ≥ 65) {
        B = False
    }
    if (X.Mathematics ≥ 65) {
        B = False
    }
    if (B) {
        A = A + 1
    }
    Move X to Table 2
}
```

Options :

1. ✖ Number of students with all subject marks more than 65

2. ✖ Number of students with exactly one subject marks less than 65

3. ✔ Number of students with all subject marks less than 65

4. ✖ Number of students with all subject marks at least 65

Question Number : 57

Correct Marks : 3

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Library" table. At the end of the execution, **A** is set to True if and only if there is a pair of books with same author and same language of publication. Choose the correct code fragment to complete the pseudocode.

```
A = False
while (Table 1 has more rows) {
    Read the first row X in Table 1
    Move X to Table 2
    while (Table 1 has more rows) {
        Read the first row Y in Table 1
        Move Y to Table 3
        **********************
        *      Fill the code      *
        **********************
    }
    Move all rows from Table 3 to Table 1
}
```

Options :

1. ✖
```
if (X.Author == Y.Author or X.Language == Y.Language) {
    A = True
}
```

2. ✔
```
if (X.Author == Y.Author and X.Language == Y.Language) {
    A = True
}
```

3. ✖
```
if (X.Author == Y.Author or X.Language == Y.Language) {
    A = False
}
```

4. ✖
```
if (X.Author == Y.Author and X.Language == Y.Language) {
    A = False
}
```

Question Number : 58

Correct Marks : 3

Question Label : Multiple Select Question

The following pseudocode is executed using the "Scores" table. At the end of the execution, **A** captures the number of students who are either from Ambur or whose Physics marks are less than the average Physics marks. Assume that the variable **Avg** holds the value of the average Physics marks. The pseudocode may have mistakes. Identify all such mistakes (if any).

```
1  A = 0
2  while (Table 1 has more rows) {
3        Read the first row X in Table 1
4        C = False
5        if (X.CityTown == "Ambur") {
6              C = False
7        }
8        if (X.Physics < Avg) {
9              C = True
10       }
11       if (C) {
12             A = 1
13       }
14       Move X to Table 2
15 }
```

Options :

1. ✖ Error in Line 5

2. ✔ Error in Line 6

3. ✖ Error in Line 8

4. ✔ Error in Line 12

5. ✖ No error

Question Number : 59

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Scores" table. What will the values of the variables **A** and **B** represent at the end of the execution?

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

Options :

1. ✖ **A** = Number of students with maximum Mathematics marks

B = Highest Mathematics marks in the dataset

2. ✖ **A** = Lowest Mathematics marks in the dataset

B = It is always one

3. ✖ **A** = Highest Mathematics marks in the dataset

B = It is always one

4. ✔ **A** = Highest Mathematics marks in the dataset

B = Number of students with maximum Mathematics marks

Question Number : 60

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Words" table. What will the value of **C** represent at the end of the execution?

```
C = 0
while (Table 1 has more rows) {
    Read the first row X from Table 1
    Move X to Table 2
    if (X.Word ends with a full stop) {
        C = C + GetSomething(Table 2 )
        Clear all rows in Table 2
    }
}

Procedure GetSomething (Table 2)
    A = 0
    While (Table 2 has more rows) {
        Read the first row X in Table 2
        Move X to Table 3
        while (Table 2 has more rows) {
            Read the first row Y in Table 2
            if (X.LetterCount == Y.LetterCount and X.PartOfSpeech ≠ Y.PartOfSpeech) {
                A = A + 1
            }
            Move Y to Table 4
        }
        Move all rows from Table 4 to Table 2
    }
    return (A)
End GetSomething
```

Options :

1. ✖ Number of pairs of words with the same part of speech and letter count

2. ✖ Number of pairs of words with the same part of speech and different letter count

3. ✖ Number of pairs of words with the same part of speech and letter count, that occur in the same sentence

4. ✔ Number of pairs of words with same letter count and different part of speech, that occur in the same sentence

Question Number : 61

Correct Marks : 5

Question Label : Multiple Select Question

The following pseudocode is executed using the "Words" table. At the end of the execution, **A** captures the number of prepositions with letter count at least three and at most four. The

pseudocode may have mistakes. Identify all such mistakes (if any).

```
1   C = 1
2   while (Table 1 has more cards) {
3       Read the first row X from Table 1
4       if (CheckSomething(X, 3, 4)) {
5           C = C + 1
6       }
7       Move X to Table 2
8   }

9   Procedure CheckSomething (Y, C1, C2,)
10      if (Y.PartOfSpeech == "Preposition") {
11          if (C1 ≤ Y.LetterCount and Y.LetterCount ≥ C2) {
12              return (True)
13          }
14          else {
15              return (False)
16          }
17      }
18      else {
19          return (False)
20      }
21  End CheckSomething
```

Options :

1. ✔ Error in Line 1

2. ✖ Error in Line 5

3. ✖ Error in Line 10

4. ✔ Error in Line 11

5. ✖ Multiple *return(False)* in procedure **CheckSomething**

6. ✖ No error

Question Number : 62

Correct Marks : 5

Question Label : Multiple Select Question

The following pseudocode is executed using the "Scores" table. At the end of the execution, **A** captures the number of female students who are above average in at least one subject. Assume that the variables **M**, **P** and **C** hold the average marks of the subjects Mathematics, Physics and

Chemistry respectively. The pseudocode may have mistakes. Identify all such mistakes (if any).

```
1  A = 0
2  while (Table 1 has more cards) {
3       Read the first row X from Table 1
4       if (CheckSomething(X, M, P, C)) {
5            A = A + 1
6       }
7       Move X to Table 2
8  }

9  Procedure CheckSomething (Y, C1, C2, C3)
10      if (Y.Gender ≠ "F") {
11           if (Y.Mathematics > C1 and Y.Physics > C2 and Y.Chemistry > C3) {
12                return (True)
13           }
14           else {
15                return (False)
16           }
17      }
18      else {
19           return (False)
20      }
21 End CheckSomething
```

Options :

1. ✖ Error in Line 4

2. ✖ Error in Line 5

3. ✔ Error in Line 10

4. ✔ Error in Line 11

5. ✖ Multiple *return(False)* in procedure **CheckSomething**

6. ✖ No error

Question Number : 63

Correct Marks : 5

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Scores" table. Let **B** be a positive integer value.

What does the procedure **DoSomething** compute?

```
Procedure DoSomething (B)
    C = 0, D = 100
    while (Table 1 has more rows) {
        Read the first row X in Table 1
        if (X.Physics > C) {
            C = X.Physics
        }
        if (X.Physics < D) {
            D = X.Physics
        }
        Move X to Table 2
    }
    if (C – D >= B) {
        return (True)
    }
    else {
        return (False)
    }
End DoSomething
```

Options :

1. ✔ Outputs "True" if and only if the difference between the maximum Physics marks and the minimum Physics marks is at least **B**

2. ✖ Outputs "True" if and only if the difference between the maximum Physics marks and the second maximum Physics marks is at most **B**

3. ✖ Outputs "True" if and only if the difference between the maximum Physics marks and the second minimum Physics marks is at least **B**

4. ✖ Outputs "True" if and only if the difference between the maximum Physics marks and the minimum Physics marks is more than **B**

Question Number : 64

Correct Marks : 6

Question Label : Multiple Select Question

The following pseudocode is executed using the "Library" table. At the end of the execution, **C** captures the number of pairs of books which have the same year of publication, or the same genre but different language. Choose the correct code fragment(s) to compute the pseudocode.

```
C = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    Move X to Table 2
    while (Table 1 has more rows) {
        Read the first row Y in Table 1
        Move Y to Table 3
        **********************
        *      Fill the code      *
        **********************
    }
    Move all rows from Table 3 to Table 1
}
```

Options :

1. ✖
```
if (X.Year == Y.Year) {
    C = C + 1
}
if (X.Genre == Y.Genre and X.Language ≠ Y.Language) {
    C = C + 1
}
```

2. ✔
```
if (X.Year == Y.Year) {
    C = C + 1
}
else{
    if (X.Genre == Y.Genre and X.Language ≠ Y.Language) {
        C = C + 1
    }
}
```

3. ✖
```
if (X.Year == Y.Year) {
    if (X.Genre == Y.Genre and X.Language ≠ Y.Language) {
        C = C + 1
    }
}
```

4. ✔
```
if ((X.Year == Y.Year)
   or (X.Genre == Y.Genre and X.Language ≠ Y.Language)) {
    C = C + 1
}
```

Statistics for Data Science 1

Number of Questions : 14

Section Marks : 50

Mark As Answered Required? : Yes

Question Number : 65

Correct Marks : 3

Question Label : Multiple Choice Question

The mean annual salary paid to all employees in a company is ₹66 lakhs. The mean annual salaries paid to male and female employees of the company are ₹50 lakhs and ₹70 lakhs respectively. Then, the percentage of males employed by the company is:

Options :

1. ✖ 60%

2. ✖ 80%

3. ✔ 20%

4. ✖ 40%

5. ✖ 50%

Question Number : 66

Correct Marks : 3

Question Label : Multiple Choice Question

If first quartile (Q_1) = 30 and third quartile (Q_3) = 40, which of the following must be true?

I. The variance is at most 100.

II. The median is 35.

III. The mean is between 30 and 40.

Options :

1. ✖ I only

2. ✖ II only

3. ✖ III only

4. ✖ I and II

5. ✖ All I,II and III are true.

6. ✔ None is true.

Question Number : 67

Correct Marks : 3

Question Label : Multiple Choice Question

Suppose the correlation coefficient between two variables *x* and *y* is 0.47. What will be the new correlation coefficient if 0.15 is added to all values of the *x* variable, every value of *y* variable is doubled, and the two variables are interchanged?

Options :

1. ✔ 0.47

2. ✖ 0.32

3. ✖ 0.94

4. ✖ 0.62

5. ✖ 0.97

Question Number : 68

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following statements about correlation coefficient, *r*, is true?

Options :

1. ✖ A correlation coefficient of 0.80 indicates a linear relationship whose slope is 4 times that of data whose correlation is 0.20.

2. ✖ A correlation coefficient of 0.4 means that 40% of the points are highly correlated.

3. ✔ Correlation coefficient is affected by outliers.

4. ✖ Correlation coefficient of variable *x* with variable *y* need not be the same as correlation coefficient of *y* with *x*.

Question Number : 69

Correct Marks : 1

Question Label : Multiple Choice Question

If the standard deviation of a set of non-zero observations is zero, you can conclude

Options :

1. ✖ that the mean (average) value is zero.

2. ✖ that the observations have same number of positive and negative data points.

3. ✔ that all observations have the same value.

4. ✖ that a mistake in calculation has been made.

5. ✖ none of these

Question Number : 70

Correct Marks : 1

Question Label : Multiple Select Question

Consider various variables that describe a used Royal Enfield motorcycle. These variables include price(INR lakhs), mileage(km/litre), model type, and model year. Their values are collected for 250 used motorcycles which are then organised in a data table. Based on this information, choose the correct option(s) from below.

Options :

1. ✔ The number of cases/observations in the data table is 250.

2. ✖ The number of cases/observations in the data table is 4.

3. ✔ Model type is a categorical variable.

4. ✖ Mileage is a categorical variable.

5. ✔ Price is a numerical variable.

Question Number : 71

Correct Marks : 3

Question Label : Multiple Select Question

The bar chart given in Figure Q.1 shows the shoe sizes of a group of 50 children. Based on this information, which of the following statements is(are) true?

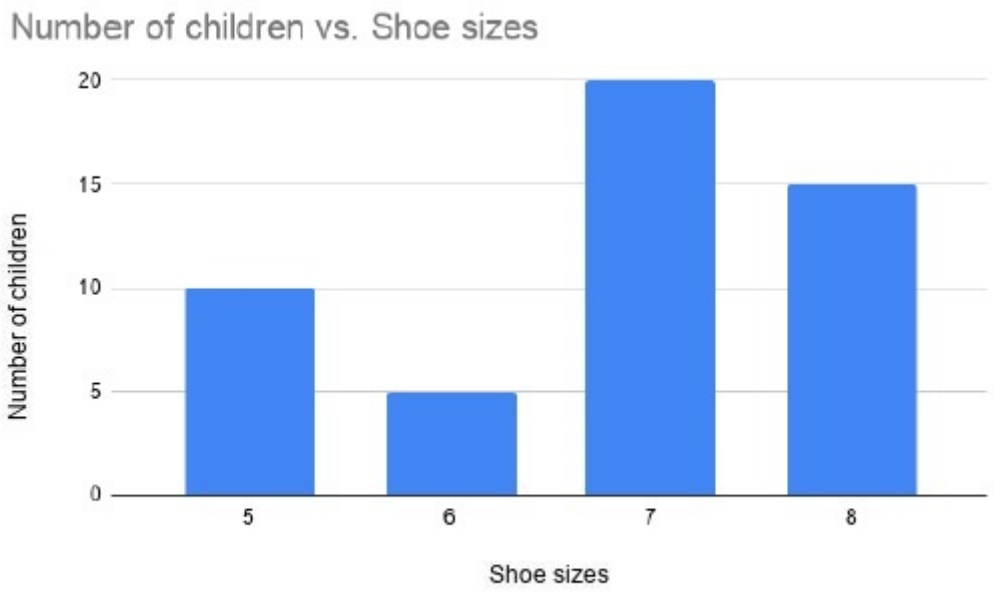

Figure Q.1: Shoe size dataset

Options :

1. ✖ 15 children wear size 7 shoes.

2. ✖ 30 children wear shoes of size less than 8.

3. ✔ 7 is the modal shoe size.

4. ✖ 6 is the median shoe size.

5. ✖ Range of the shoe size is 4.

6. ✖ The value of the first quartile (Q_1) for the shoe size is 5.

7. ✔ 35 children wear shoes size larger than 6.

Question Number : 72

Correct Marks : 3

Question Label : Multiple Select Question

In a call center, there are 100 employees and the number of calls they receive vary over the length of the day. The working hours are 9 AM to 6 PM with lunch break from 1 PM to 2 PM. The average number of calls received from 9 AM to 1 PM by an employee is 6 per hour, and the average number of calls received by the employee from 2 PM to 6 PM is 10 per hour. Based on this data, choose the correct options from below.

Options :

1. ✖ Average number of calls received by an employee in working hours is 10 *calls/hour*.

2. ✔ Average number of calls received by an employee in working hours is 8 *calls/hour*.

3. ✔ The correlation coefficient of time and calls received is positive.

4. ✖ The correlation coefficient of time and calls received is negative.

5. ✖ The standard deviation of the calls received is equal to zero.

6. ✖ The slope of the trend line is negative.

Question Number : 73

Correct Marks : 3

Question Label : Multiple Select Question

The correlation was found to be r = - 0.86 between price (x) and demand of mobile phones (y). Which of the following options could be true?

Options :

1. ✔ Given two points from the scatter plot of price and demand of mobile phones, one point has a smaller x value and a larger y value than another point.

2. ✔ Given two points from the scatter plot of price and demand of mobile phones, one point has a larger x value and a smaller y value than another point.

3. ✔ The covariance of price and demand of mobile phones is negative.

4. ✖ The covariance of price and demand of mobile phones is positive.

Question Number : 74

Correct Marks : 3

Question Label : Short Answer Question

Annual summary of five employees in an insurance company is given in Table Q.2. If the ratio of insurance policies sold by B and D are in the ratio 5:12, then how many insurance policies did employee D sell?

Insurance employee	Frequency	Relative frequency
A	175	0.21875
B		
C	100	0.125
D		
E	100	0.125

Table Q.2: Insurance dataset

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

300

Question Numbers : (75 to 77)

Question Label : Comprehension

Use the following information and data given in Figure Q.2 and Figure Q.3 to answer the given subquestions

The stem and leaf plot diagrams given in Figure Q.2 and Figure Q.3 show the results of Statistics and Mathematics exams conducted in a school respectively. In Figure Q.3, a is an unknown value.

4	2 4 8
5	1 3 6 9
6	2 4 6 8 9
7	3 5 7 8 8 8 9
8	2 5 8
9	5 7

Figure Q.2: Stem and leaf plot of scores of Statistics paper, Key: $4|2 = 42$

4	0
5	2 3 7
6	1 2 4 9
7	7
8	1 3 5 7 7 7
9	a

Figure Q.3: Stem and leaf plot of scores of Mathematics paper, Key: $4|0 = 40$

Sub questions

Question Number : 75

Correct Marks : 1

Question Label : Short Answer Question

What is the difference between the modal scores of Mathematics and Statistics?

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

9

Question Number : 76

Correct Marks : 3

Question Label : Short Answer Question

If the range of Mathematics scores is greater than the range of Statistics scores by 3, then the value of α is

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

8

Question Number : 77

Correct Marks : 1

Question Label : Short Answer Question

What is the difference between the medians of the two scores?

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

2

Question Numbers : (78 to 81)

Question Label : Comprehension

Use the following information and data given in Table Q.1 to answer the given subquestions

The placement statistics for the year 2020 of an engineering college that grants degrees in Computer Engineering and Mechanical Engineering is given in Table Q.1.

Roll No	Gender	Score Percentage	Specialisation	Placement Status	Salary (INR lakhs)
CS18B001	M	85%	CSE	Placed	12.00
ME18B001	M	95%	ME	Placed	8.00
ME18B002	F	75%	ME	Placed	9.00
CS18B002	F	78%	CSE	Placed	8.00
CS18B003	M	85%	CSE	Not placed	
CS18B004	F	88%	CSE	Placed	9.00
ME18B003	M	85%	ME	Not placed	
CS18B005	F	75%	CSE	Placed	12.00
CS18B006	F	65%	CSE	Placed	6.00
CS18B007	M	92%	CSE	Placed	25.00
CS18B008	F	55%	CSE	Not placed	
ME18B004	M	95%	ME	Placed	9.00
CS18B009	M	82%	CSE	Placed	15.00
CS18B010	F	87%	CSE	Placed	8.00
ME18B005	M	50%	ME	Not placed	

Table Q.1: Placements dataset

Sub questions

Question Number : 78

Correct Marks : 1

Question Label : Multiple Select Question

Which of the following is (are) case(s)?

Options :

1. ✔ CS18B001

2. ✔ ME18B004

3. ✖ F

4. ✔ CS18B009

5. ✖ CSE

6. ✖ ME

Question Number : 79

Correct Marks : 1

Question Label : Multiple Select Question

Which of the following is (are) numerical variable(s)?

Options :

1. ✖ Roll No

2. ✔ Score Percentage

3. ✖ Placement Status

4. ✖ Specialisation

5. ✔ Salary (INR lakhs)

Question Number : 80

Correct Marks : 3

Question Label : Short Answer Question

What is the population standard deviation of the salary in INR lakhs of the students? (Ignore the cases of students who are not placed.) Enter the answer up to 3 decimal points accuracy.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

4.8 to 5.2

Question Number : 81

Correct Marks : 5

Question Label : Short Answer Question

What is the absolute value of the point bi-serial correlation coefficient of association between gender and salary among the students? (Ignore the cases of students who are not placed.) Enter the answer up to 3 decimal points accuracy.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

0.48 to 0.53

Question Numbers : (82 to 84)

Question Label : Comprehension

Use the following information and data given in Figure Q.4 to answer the given subquestions

The stacked bar chart given in Figure Q.4 represents the repayment status of 2000 loans sanctioned by a prominent bank in the month of July.

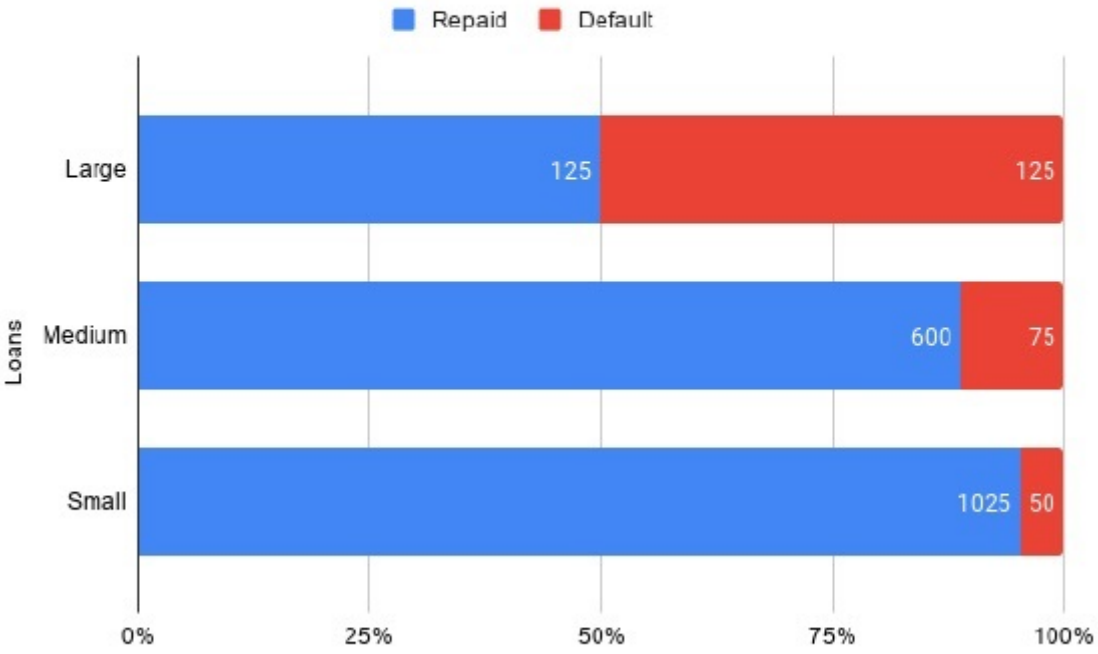

Figure Q.4: Loan dataset

Sub questions

Question Number : 82

Correct Marks : 1

Question Label : Multiple Choice Question

What is the median of the loan variable?

Options :

1. ✖ Large

2. ✔ Small

3. ✖ Medium

4. ✖ Median is not defined for the loans.

Question Number : 83

Correct Marks : 1

Question Label : Short Answer Question

What is the relative frequency of repaid loans in the overall 2000 loans lent by the bank? Enter the answer up to three decimals accuracy.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

0.875

Question Number : 84

Correct Marks : 1

Question Label : Multiple Choice Question

What is the mode of the loans lent by the bank?

Options :

1. ✖ Large

2. ✔ Small

3. ✖ Medium

4. ✖ Mode is not defined for the loans.

Question Numbers : (85 to 86)

Question Label : Comprehension

Use the data given in Figure Q.5 to answer the given subquestions

The histogram of runs scored by a batsman in his career is given in Figure Q.5.

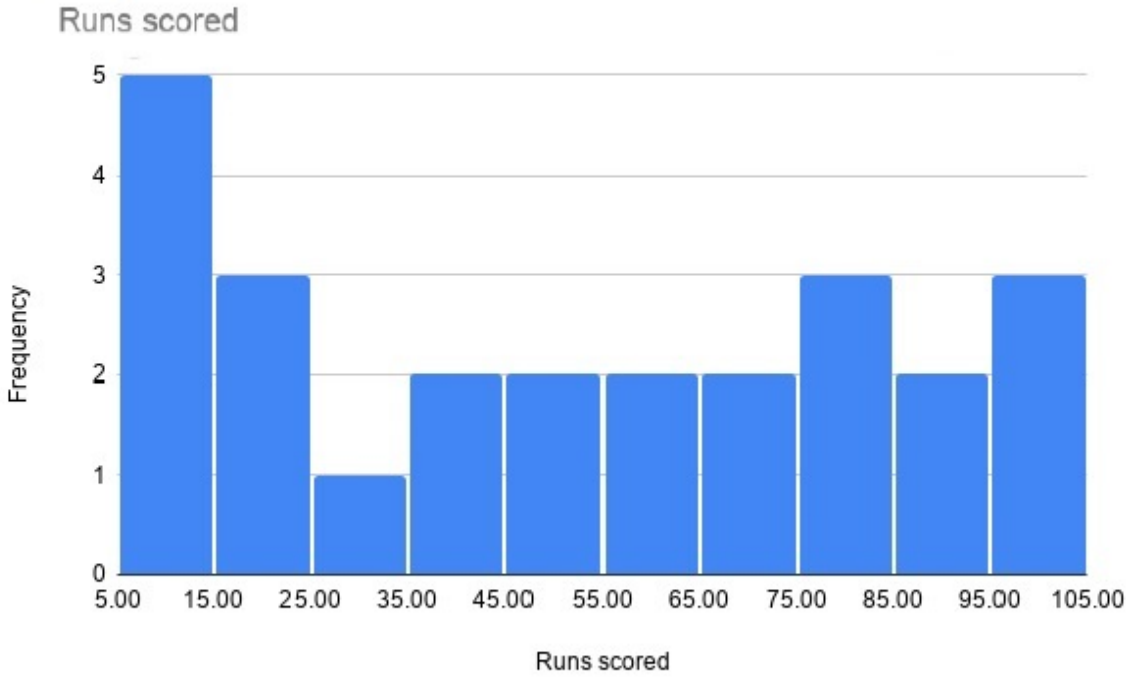

Figure Q.5: Runs dataset

Sub questions

Question Number : 85

Correct Marks : 1

Question Label : Short Answer Question

What is the approximate mean of the runs scored by the batsman?

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

Question Number : 86

Correct Marks : 5

Question Label : Short Answer Question

What is the approximate sample standard deviation of the runs scored by the batsman? Enter the answer up to 3 decimals accuracy. Hint: Use the class mark and frequency to solve for standard deviation.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

32.4 to 32.9

Mathematics for Data Science 1

Number of Questions :	13
Section Marks :	50
Mark As Answered Required? :	Yes

Question Number : 87

Correct Marks : 0

Question Label : Multiple Choice Question

Set of instructions
Qualifier examination
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 :

1. ✔ Useful Data has been mentioned above.

2. ✖ This data attachment is just for a reference & not for an evaluation.

Question Number : 88

Correct Marks : 2

Question Label : Multiple Choice Question

Find the midpoint of the line segment joining the origin and the point of intersection of the straight lines $\frac{x}{3}+\frac{y}{6}=1$ and $\frac{x}{6}+\frac{y}{3}=1$.

Options :

1. ✖ $(2,2)$

2. ✖ $(\frac{2}{3},\frac{2}{3})$

3. ✔ $(1, 1)$

4. ✖ $(\frac{4}{3}, \frac{4}{3})$

Question Number : 89

Correct Marks : 2

Question Label : Multiple Choice Question

The points $(\lambda, -2\lambda)$, $(2\lambda, -\lambda)$ and $(2\lambda - 1, \lambda + 1)$ are collinear if

Options :

1. ✖ $\lambda = 1$

2. ✔ $\lambda = -1$

3. ✖ $\lambda = 0$

4. ✖ $\lambda = \frac{1}{2}$

Question Number : 90

Correct Marks : 3

Question Label : Multiple Choice Question

A student finds that the rate of loss of stability (r) of a chemical is a function of pressure (P) and temperature (T) inside the container holding the chemical. He further finds that r is given by $r = cPT$, where c is a constant. The pressure is the function of internal surface area (a) of the container given by $P = (25 - 8a + a^2)$ and $T = 81k$, where k is constant. What should be the internal surface area of the container to keep the rate minimum?

Options :

1. ✔ 4

2. ✖ 9

3. ✖ 16

4. ✖ 6

Question Number : 91

Correct Marks : 3

Question Label : Multiple Choice Question

There are four employees in a company. Their salaries (₹ in lakhs) for the year 2010 are given in Table 1. Further, the table also gives their respective increments in salary (₹ in lakhs) per year for all employees except Sonia.

Employee	Salary in 2010	Increment in salary per year
Hemant	8	0.3
Natasha	9	0.4
Sonia	10	-
Kunal	11	0.7

Table 1: Incomplete table of salaries and increments

If Sonia's salary is ₹20 lakhs for the year 2020, which option gives the correct relationship between the number of years since 2010 (y) and the total salary (C) given away by the company for the same year?

Options :

1. ✖ $C = 2.6y + 38$

2. ✖ $C = 0.8y + 10$

3. ✖ $C = 2.6y + 32$

4. ✖ $C = 2.6y + 40$

5. ✖ $C = 2.4y + 20$

6. ✔ $C = 2.4y + 38$

Question Number : 92

Correct Marks : 2

Question Label : Multiple Select Question

Which of the following pairs of straight lines are perpendicular to each other?

Options :

1. ✖ $2x + y = 1$ and $2x - y = -1$

2. ✖ $x = 0$ and $x = y$

3. ✔ $2x + 3y = 9$ and $\frac{y}{12} - \frac{x}{8} = 3$

4. ✔ $\frac{x}{8} + \frac{y}{9} = 1$ and $\frac{x}{9} - \frac{y}{8} = 1$

Question Number : 93

Correct Marks : 4

Question Label : Multiple Select Question

Define the following three sets.

- $S_1 = \{x \mid x \in \mathbb{R}, x^2 + 3 = 0\}$
- $S_2 = \{x \mid x \in \mathbb{R}, x^2 - 3 = 0\}$
- $S_3 = \{x \mid x \in \mathbb{R} \setminus \mathbb{Q}, (x^2 - 3)(x^2 - 9) = 0\}$

Which of the following statements is (are) correct?

Options :

1. ✖ S_2 is null set.

2. ✔ $S_1 \cap S_3$ is null set.

3. ✔ $S_1 \setminus S_3$ is null set.

4. ✔ $S_2 = S_3$.

Question Number : 94

Correct Marks : 5

Question Label : Multiple Select Question

A Wi-Fi router is kept at position $(0, 0)$ and its maximum transmission range is 20m. If Rohan is walking along a straight line ℓ and his phone is in the transmission range of the Wi-Fi router for a brief duration, then ℓ could be (assume $x \in [-40, 40]$ for all the options and unit length is 1m):

Options :

1. ✔ $y = 10$

2. ✖ $x + y - 20\sqrt{3} = 0$

3. ✖ $x - y - 30 = 0$

4. ✔ $x - y - 15 = 0$

5. ✖ All of these

Question Number : 95

Correct Marks : 5

Question Label : Multiple Select Question

A mobile company offers two plans. Plan A costs ₹300 and offers 900 free minutes per month with a charge of 15 paise per minute for every additional minute. Plan B costs ₹400 and offers 1500 free minutes per month with a charge of 10 paise per minute for every additional minute. Let $C_A(t)$ and $C_B(t)$ represent the total cost per month for the plan A and the plan B respectively, where t represents the number of minutes used. If Riya uses 1800 minutes per month, then choose the set of correct options with respect to Riya.

Options :

1. ✖ Plan A costs less than plan B.

2. ✔ Plan B costs less than plan A.

3. ✔ $C_A(t) = 300$, for all $t \in [0, 900]$.

4. ✖ $C_A(t) = 0.1t + 250$, for all $t \in [900, 1800]$.

5. ✔ $C_B(t) = 0.1t + 250$, for all $t \in [1500, 1800]$.

Question Number : 96

Correct Marks : 4

Question Label : Short Answer Question

A sponsor organized a cricket tournament consisting of exactly 30 matches in which each participating teams played with every other team exactly 2 times. How many teams participated?

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

6

Question Number : 97

Correct Marks : 5

Question Label : Short Answer Question

The cable of a uniformly loaded suspension bridge hangs in the form of a parabola. The roadway which is horizontal and 100 m long is supported by vertical wires attached to the cable, the longest wire being 25 m and the shortest being 5 m, as in Figure 1. Find the length (in m) of a supporting wire attached to the roadway 25 m from the middle (assuming there is a supporting wire attached to the roadway 25m from the middle).

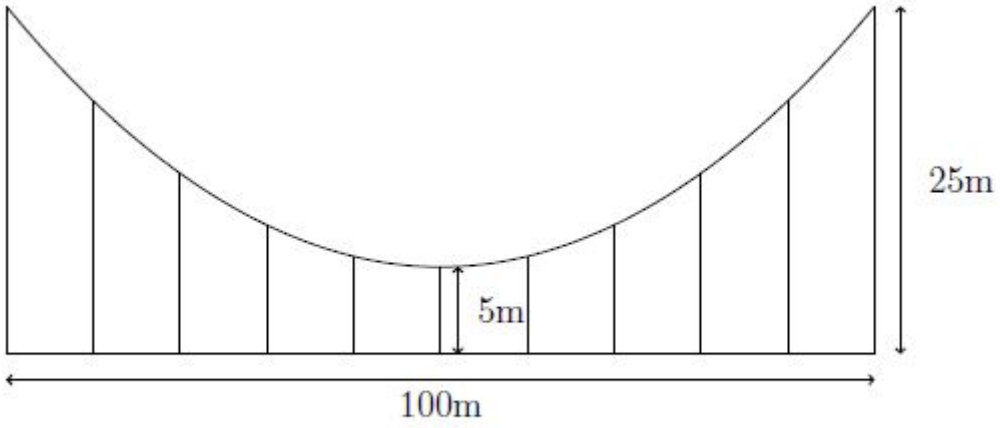

Figure 1

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

10

Question Numbers : (98 to 99)

Question Label : Comprehension

Let L be the set of all lines in the XY plane. Define the relations R_1 and R_2 as follows,

- $R_1 = \{(\ell_1, \ell_2) \mid \ell_1, \ell_2 \in L \text{ and } \ell_1 \text{ is perpendicular to } \ell_2\}$.
- $R_2 = \{(\ell_1, \ell_2) \mid \ell_1, \ell_2 \in L \text{ and } \ell_1 \text{ is parallel to } \ell_2\}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 98

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following is (are) correct?

Options :

1. ✔ If $(\ell_1, \ell_2) \in R_1$ and $(\ell_2, \ell_3) \in R_2$, then $(\ell_1, \ell_3) \in R_1$

2. ✖ If (ℓ_1, ℓ_2) and (ℓ_2, ℓ_3) are in R_2, then $(\ell_1, \ell_3) \in R_1$

3. ✔ If $(\ell_1, \ell_2) \in R_2$ and $(\ell_2, \ell_3) \in R_1$, then $(\ell_1, \ell_3) \in R_1$

4. ✖ R_1 is an equivalence relation

Question Number : 99

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following is (are) correct?

Options :

1. ✔ $(2x + 3y = 4,\ 3x + \frac{9}{2}y = 9) \in R_2$

2. ✔ $(y = \frac{x}{2} + \frac{5}{2},\ 2x + y = 7) \in R_1$

3. ✖ $(3x - 5y = 7, y = \frac{5}{3}x + \frac{4}{3}) \in R_1$

4. ✖ $(\sqrt{2}x + \sqrt{3}y = 1, \sqrt{3}x - \sqrt{2}y = 1) \in R_2$

Question Numbers : (100 to 102)

Question Label : Comprehension

Figure 2 shows the known values and future predictions of the amount of municipal solid waste (in

million metric tons) generated across India from 2001 to 2041 for every 10 years.

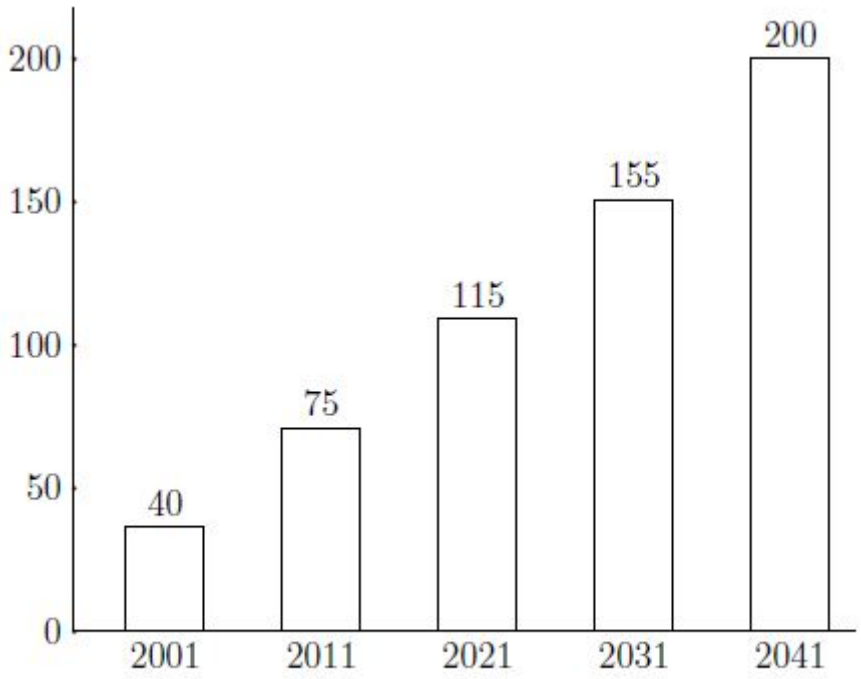

Figure 2

Using this information, answer the given subquestions.

Sub questions

Question Number : 100

Correct Marks : 4

Question Label : Multiple Select Question

Two organisations *A* and *B* have fitted a line for the given data as $y = 4x + 40$ and $y = 4.1x + 40$ respectively, where y is the waste generated, and x is the number of years since 2001 (i.e., we are considering $x = 0$ for the year 2001, $x = 1$ for the year 2002 and so on). Choose the correct set of options.

Options :

1. ✔ Line fit predicted by organisation *A* is better than that predicted by *B*.

2. ✖ Line fit predicted by organisation *B* is better than that predicted by *A*.

3. ✖ Both fit are same in terms of Sum Squared Error (SSE).

4. ✔ SSE calculated by organisation *B* is 165.

5. ✔ SSE calculated by organisation *A* is 75.

6. ✖ SSE calculated by both the organisations is 150.

Question Number : 101

Correct Marks : 3

Question Label : Multiple Choice Question

An organisation has come up with an idea to predict the line for the given data as $y = mx + c$, where m is calculated as the arithmetic mean of slopes taken at each 10 year interval, and the line is assumed to pass through the first point. What will the predicted line be?

Options :

1. ✖ $y = 3.8x + 40$

2. ✖ $y = 3.7x + 40$

3. ✔ $y = 4.0x + 40$

4. ✖ $y = 4.1x + 40$

5. ✖ $y = 4x$

6. ✖ $y = 4.1x$

Question Number : 102

Correct Marks : 2

Question Label : Short Answer Question

If the most accurate model is $y = 4.1x + 37$, what will be the increment in waste generated (in million metric ton) from year 2021 to year 2031?

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

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