IIT M QUALIFIER EXAM POD21QFBQPB

Notations :

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

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

Question Paper Name :	IIT M QUALIFIER EXAM POD21QFBQPB AN 11 July 2021
Total Marks :	200

English

Number of Questions :	18
Section Marks :	50

Question Type : COMPREHENSION

Question Numbers : (1 to 5)

Question Label : Comprehension

Read the passage and answer the subquestions that follow

The Battle of Chancellorsville

The Battle of Chancellorsville, one of the most famous battles of the Civil War, took place in Virginia in the spring of 1863. For months, the two armies had been staked out on opposite banks of a narrow river. The Confederate troops were led by perhaps the most revered military tactician in American history, General Robert E. Lee. The Union soldiers were led by "Fighting" Joe Hooker. In appearance, personality, and lifestyle, these men were nearly perfect opposites. Lee, an older man in poor health with a gray beard, had a somber, measured demeanor. Hooker was a blond, strapping young man whose vanity over his appearance was but one aspect of his egotism. Whereas Lee was devout and principled, Hooker was known for his rollicking enjoyment of both women and whiskey. Despite the fact that the Confederacy had won the last four major battles and the Union soldiers were famished, exhausted, and demoralized, Hooker proclaimed, "My plans are perfect. And when I start to carry them out, may God have mercy on Bobby Lee, for I shall have none." Why, aside from a propensity for narcissism, was Hooker so confident? Hooker had used spies, analysts, and even hot air balloons to compile a vast amount of intelligence about Lee's army. He had discerned, for example, that Lee had only 61,000 men to Hooker's own 134,000. Buoyed by his superior numbers, Hooker covertly moved 70,000 of his men fifteen miles up and across the river, and then ordered them to sneak back down to position themselves behind Lee's army. In effect, Hooker had cut off the Confederate soldiers in front and behind. They were trapped. Satisfied with his advantage, Hooker became convinced that Lee's only option was to retreat to Richmond, thus assuring a Union victory. Yet Lee, despite his disadvantages of both numbers and position, did not retreat. Instead, he moved his troops into position to attack. Union soldiers who tried to warn Hooker that Lee was on the offensive were dismissed as cowards. Having become convinced that Lee had no choice but to retreat, Hooker began to ignore reality. When Lee's army attacked the Union soldiers at 5:00 p.m., they were eating supper, completely unprepared for battle. They abandoned their rifles and fled as Lee's troops came shrieking out of the brush, bayonets drawn. Against all odds, Lee won the Battle of Chancellorsville, and Hooker's forces withdrew in defeat.

Sub questions

Question Number : 1 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the odd one out.

Options :

A. ✖ Somber

B. ✖ Dull

C. ✖ Dingy

D. ✔ Demeanor

Question Number : 2 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

The word that means “excessive interest or admiration of oneself and one's physical appearance”.

Options :

A. ✔ Narcissism

B. ✖ Confederate

C. ✖ Demeanor

D. ✖ Retreat

Question Number : 3 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

A _____ person has deep religious beliefs and principles.

Options :

A. ✖ Narcissist

B. ✖ Somber

C. ✔ Devout

D. ✖ Superior

Question Number : 4 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Joe Hooker and Robert Lee have opposite personality traits.

Options :

A. ✔ TRUE

B. ✖ FALSE

Question Number : 5 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

From the passages given, it can be inferred that the bigger the size of the army, the better the chances of victory.

Options :

A. ✖ TRUE

B. ✔ FALSE

Question Type : COMPREHENSION

Question Numbers : (6 to 10)

Question Label : Comprehension

[Listen to the audio sample and answer the given subquestions. You need no background information to answer these questions.]


885_640653_0_1984128_qualifier2.mp3

Sub questions

Question Number : 6 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

An item of property owned by a person is _____.

Options :

A. ✖ Income

B. ✖ Expenditure

C. ✔ Asset

D. ✖ Liability

Question Number : 7 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

A lifetime cash flow forecast is a calculation of the money that one can expect to have in future.

Options :

A. ✔ TRUE

B. ✖ FALSE

Question Number : 8 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Neil lives in bliss, having a fair idea of how big his debts are.

Options :

A. ✖ TRUE

B. ✔ FALSE

Question Number : 9 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Financial organisation is not significant for young people.

Options :

A. ✖ TRUE

B. ✔ FALSE

Question Number : 10 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

The word ‘millionaire’ first appeared in French.

Options :

A. ✔ TRUE

B. ✖ FALSE

Question Type : COMPREHENSION

Question Numbers : (11 to 25)

Question Label : Comprehension

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

1._____ marine biologist placed a shark into a large holding tank during a research experiment and then released several small 2. _____ fish into the tank. As you would 3._____, the shark quickly swam around the tank, attacked and ate the smaller fish. The marine biologist then inserted a strong piece of clear fibreglass 4._____ the tank, creating two separate partitions. She then put the shark on one side of the fibreglass and a new baitfish set on the 5._____. Again, the shark quickly attacked. This time, 6._____, the shark slammed into the fibreglass divider and bounced off. 7._____, the shark kept repeating this behaviour every few minutes to no avail.

Meanwhile, the baitfish swam around unharmed in the second partition. Eventually, about an hour into the experiment, the shark gave 8._____. This experiment was repeated several dozen times over the next few 9._____. Each time, the shark got less aggressive and made 10._____ attempts to attack the baitfish, 11._____eventually, the shark got tired of

hitting the fibreglass divider and simply stopped attacking altogether. The marine biologist then removed the fibreglass divider, but the shark did not attack. The shark was trained to 12._____a barrier existed between it and the baitfish, so the baitfish swam wherever they wished, free 13. _____ harm.

The Moral of the story: Most people tend to give up after facing a series of setbacks and failures. But do not let these setbacks keep you 14. _____ trying again. Think of each setback as an opportunity to learn. Do not let the 15. _____ that you set for yourself in your mind keep you from achieving your goals. Remember, nothing is impossible if you set your mind to it.

Sub questions

Question Number : 11 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 1.** _____

Options :

A. ✔ a

B. ✖ an

C. ✖ the

Question Number : 12 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 2.** _____

Options :

A. ✖ bate

B. ✔ bait

C. ✖ bite

Question Number : 13 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 3.** _____

Options :

A. ✖ accept

B. ✔ expect

C. ✖ excerpt

Question Number : 14 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 4.** _____

Options :

A. ✖ on

B. ✔ inside

C. ✖ at

Question Number : 15 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 5.** _____

Options :

A. ✖ former

B. ✖ latter

C. ✔ other

Question Number : 16 Question Type : MCQ Is Question Mandatory : No Option Orientation :

Vertical

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 6.** _____

Options :

A. ✔ however

B. ✖ so

C. ✖ therefore

Question Number : 17 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 7.** _____

Options :

A. ✖ Dettered

B. ✔ Undettered

Question Number : 18 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 8.** _____

Options :

A. ✔ up

B. ✖ over

C. ✖ with

Question Number : 19 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 9.** _____

Options :

A. ✖ weak

B. ✖ week

C. ✔ weeks

Question Number : 20 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 10.** _____

Options :

A. ✖ fewest

B. ✔ fewer

C. ✖ weakest

Question Number : 21 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 11.** _____

Options :

A. ✔ until

B. ✖ over

C. ✖ because

Question Number : 22 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 12.** _____

Options :

A. ✖ beleive

B. ✔ believe

C. ✖ beleave

Question Number : 23 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 13.** _____

Options :

A. ✔ from

B. ✖ off

C. ✖ over

Question Number : 24 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 14.** _____

Options :

A. ✔ from

B. ✖ out of

C. ✖ over

Question Number : 25 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Select your answer for **Blank 15.** _____

Options :

A. ✔ barriers

B. ✖ dreams

Question Number : 26 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

The word ‘split’ is monosyllabic.

Options :

A. ✔ TRUE

B. ✖ FALSE

Question Number : 27 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

'The' is a definite determiner.

Options :

A. ✔ TRUE

B. ✖ FALSE

Question Number : 28 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

In the phrase, 'to the school', 'to' is (a/an) _____.

Options :

A. ✔ Preposition

B. ✖ Adverb

Question Number : 29 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

In the word 'scream', /k/ is a non-aspirated sound.

Options :

A. ✔ TRUE

B. ✖ FALSE

Question Number : 30 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

The word 'bring' is monosyllabic.

Options :

A. ✔ TRUE

B. ✖ FALSE

Question Number : 31 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

'Please come' is a request.

Options :

A. ✔ TRUE

B. ✖ FALSE

Question Number : 32 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

The phrase ‘hang up’ (in the context of phone conversations) means to wait for a short time.

Options :

A. ✖ TRUE

B. ✔ FALSE

Question Number : 33 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

In the sentence, ‘I can hear you **on and off**’, the phrase ‘on and off’ means

Options :

A. ✖ The voice is clear and audible.

B. ✔ The voice is unclear and gets cut off from time to time.

Question Number : 34 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Mark the correct one.

Options :

A. ✖ loot- /lut/

B. ✔ loot- /lu:t/

Question Number : 35 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

In the phrase, 'the king', 'the' is a determiner and 'king' is a _____.

Options :

A. ✖ Verb

B. ✔ Noun

C. ✖ Adjective

D. ✖ Adverb

Question Number : 36 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

They _____ like ice-creams.

Options :

A. ✔ do not

B. ✖ does not

Question Number : 37 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

'He was a good player.' This sentence is an indicator of _____ tense.

Options :

A. ✖ Present

B. ✔ Past

Question Number : 38 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Do you mind/coming tomorrow at the same time // sir

The phrasal pause marked is

Options :

A. ✖ Appropriate

B. ✔ Inappropriate

Question Number : 39 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

The phrase 'hang on' (in the context of telephonic conversation) means to wait for sometime or hold for a moment.

Options :

A. ✔ TRUE

B. ✖ FALSE

Question Number : 40 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

In the word ‘creeper’, the sound /k/ is aspirated.

Options :

A. ✔ TRUE

B. ✖ FALSE

Computational thinking

Number of Questions : 14

Section Marks : 50

Question Number : 41 Question Type : MCQ

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

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

Olympics

Seq. No.	Name	Gender	Nationality	Host country	Year	Sport	Medal
0	Karnam Malleswari	F	Indian	Australia	2000	Weightlifting	Bronze
▬ ▬ ▬							
49	Michael Phelps	M	American	China	2008	Swimming	Gold

Options :

A. ✔ Useful Data has been mentioned above.

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

Question Number : 42 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

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

```
Count = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    if (X.CityTown == "Chennai" and X.Chemistry < 75) {
        Count = Count + 1
    }
    Move X to Table 2
}
```

Options :

A. ✖ Number of students who scored less than 75 marks in Chemistry

B. ✖ Number of students who scored more than 75 marks in Chemistry

C. ✔ Number of Chennai students who scored less than 75 marks in Chemistry

D. ✖ Number of Chennai students who scored more than 75 marks in Chemistry

Question Number : 43 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

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

```
A = 0
while (Pile 1 has more cards) {
    Read the first row X in Table 1
    Move X to Pile 2
    while (Pile 1 has more cards) {
        Read the first row Y in Table 1
        Move Y to Pile 3
        if (X.Author == Y.Author and X.Language ≠ Y.Language) {
            A = A + 1
        }
    }
    Move all cards from Pile 3 to Pile 1
}
```

Options :

A. ✖ Number of pairs of books having different author but in the same language

B. ✖ Number of pairs of books having either same author or in the same language

C. ✔ Number of pairs of books having same author but in the different languages

D. ✖ Number of pairs of books having same author and in the same language

Question Number : 44 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

The following pseudocode is executed using the "Words" dataset. What will **A** represent at the end of execution? It is a Multiple Select Question (MSQ).

```
A = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    Move X to Table 2
    if (X.PartOfSpeech == "Adverb" or X.LetterCount > 5) {
        A = A + 1
    }
}
```

Options :

A. ✖ Number of adverbs which have more than 5 letters

B. ✖ Number of adverbs + Number of words which have more than 5 letters

C. ✔ Number of adverbs + Number of words other than adverbs which have more than 5 letters

D. ✔ Number of words which have letter count more than 5 + Number of adverbs which have 5 letters or less

Question Number : 45 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

The following pseudocode is executed using the "Olympics" dataset. Assume that no player has won multiple medals of the same type in a given sport. **Count** represents the number of pairs of distinct players who won different medals in the same sport. Choose the correct code fragment to complete the pseudocode. It is a Multiple Select Question (MSQ).

```
Count = 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 :

A. ✖

```
if (X.Medal ≠ Y.Medal and X.Sport == Y.Sport) {
    Count = Count + 1
}
```

B. ✔

```
if (X.Name ≠ Y.Name and X.Medal ≠ Y.Medal and X.Sport == Y.Sport) {
    Count = Count + 1
}
```

C. ✔

```
if (X.Name ≠ Y.Name) {
    if (X.Medal ≠ Y.Medal) {
        if (X.Sport == Y.Sport) {
            Count = Count + 1
        }
    }
}
```

```
    if (X.Name ≠ Y.Name) {
        if (X.Medal ≠ Y.Medal and X.Sport == Y.Sport) {
            Count = Count + 1
        }
    }
```

D. ✔

Question Type : COMPREHENSION

Question Numbers : (46 to 47)

Question Label : Comprehension

The following pseudocode is executed using the "Words" dataset.

```
CountA = 0, CountB = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    i = X.LetterCount
    A = first letter of X.Word
    B = i^th letter of X.Word
    if (A ≠ B) {
        if (A is a vowel) {
            if (B is a vowel) {
                CountA = CountA + 1
            }
            CountB = CountB + 1
        }
    }
    Move X to Table 2
}
```

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 46 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

What will **CountB** represent at the end of execution?

Options :

A. ✖ Number of words which start and end with the different vowels

B. ✖ Number of words which start and end with the different letters

C. ✖ Number of words which start with a vowel and end with a non-vowel

D. ✔ Number of words which start with a vowel and end with a letter which is different from the starting letter

Question Number : 47 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

What will **CountA** represent at the end of execution?

Options :

A. ✔ Number of words which start and end with the different vowels

B. ✖ Number of words which start and end with the different letters

C. ✖ Number of words which start with a vowel but end with a non-vowel

D. ✖ Number of words which start with a vowel and end with a letter which is different from the starting letter

Question Number : 48 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Words" dataset. What will **A** and **Count**

represent at the end of execution?

```
A = 0, Count = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    if (X.LetterCount == A and X.PartOfSpeech == "Noun") {
        Count = Count + 1
    }
    if (X.LetterCount > A and X.PartOfSpeech == "Noun") {
        A = X.LetterCount
        Count = 1
    }
    Move X to Table 2
}
```

Options :

A. ✖ A = Length of a noun
Count = Number of occurrences of nouns

B. ✖ A = Length of the longest noun
Count = It is always one

C. ✖ A = Length of the shortest noun
Count = Number of occurrences of the shortest nouns

D. ✔ A = Length of the longest noun
Count = Number of occurrences of the longest nouns

Question Number : 49 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

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

```
Count = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    Move the row X to Table 2
    while (Table 1 has more rows) {
        Read the first row Y in Table 1
        Count = Count + compareSomething(X.Total, Y.Total)
        Count = Count + compareSomething(Y.Total, X.Total)
        Move the row Y to Table 3
    }
    Move all rows from Table 3 to Table 1
}
Procedure compareSomething(A, B)
    if (A ≥ B) {
        return (1)
    }
    else {
        return (-1)
    }
End compareSomething
```

Options :

A. ✖ Number of pairs of students who have different total marks

B. ✖ Number of pairs of students who have same total marks

C. ✖ Twice the number of pairs of students who have different total marks

D. ✔ Twice the number of pairs of students who have same total marks

E. ✖ It is always zero

Question Number : 50 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Scores" dataset. At the end of execution, **B** captures the maximum Mathematics marks of a student whose

(i) Total marks is more than the average total marks

(ii) Mathematics marks is less than Physics and Chemistry marks

Assume that the variable **Avg** holds the value of the average total marks. Choose the correct code

fragment to complete the pseudocode.

```
while (Table 1 has more rows) {
    Read the first row X in Table 1
    **********************
    *      Fill the code      *
    **********************
}
B = 0
while (Table 3 has more rows) {
    Read the first row X in Table 3
    if (X.Total > Avg  and X.Mathematics > B) {
        B = X.Mathematics
    }
    Move X  to Table 2
}
```

Options :

A. ✖

```
if (X.Mathematics < X.Physics  and X.Mathematics > X.Chemistry) {
    Move X  to Table 2
}
else {
    Move X  to Table 3
}
```

B. ✔

```
if (X.Mathematics < X.Physics  and X.Mathematics < X.Chemistry) {
    Move X  to Table 3
}
else {
    Move X  to Table 2
}
```

C. ✖

```
if (X.Mathematics > X.Physics  or X.Mathematics > X.Chemistry) {
    Move X  to Table 2
}
else {
    Move X  to Table 3
}
```

D. ✖

```
if (X.Mathematics < X.Physics  or X.Mathematics < X.Chemistry) {
    Move X  to Table 3
}
else {
    Move X  to Table 2
}
```

Question Number : 51 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

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

```
A = 0, B = 0, C = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    Move X to Table 2
    if (X.PartOfSpeech == "Noun") {
        B = B + 1
    }
    if (X.PartOfSpeech == "Pronoun") {
        C = C + 1
    }
    if (X.Word ends with a full stop) {
        if (B ≤ 2 and C ≥ 1) {
            A = A + 1
        }
        B = 0, C = 0
    }
}
```

Options :

A. ✖ Number of sentences with at most two nouns and one pronoun

B. ✖ Number of sentences with two nouns and at least one pronoun

C. ✖ Number of sentences with at least two nouns and at most one pronoun

D. ✔ Number of sentences with at most two nouns and at least one pronoun

Question Number : 52 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

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

```
A = 0
while (Table 1 has more rows) {
    Read the first row X in Table 1
    Move X to Table 2
    B = True
    while (Table 1 has more rows) {
        Read the first row Y in Table 1
        if (X.Word == Y.Word) {
            B = False
            Move Y to Table 2
        }
        else {
            Move Y to Table 3
        }
    }
    if (B) {
        A = A + 1
    }
    Move all rows from Table 3 to Table 1
}
```

Options :

A. ✖ Number of pairs of unique words

B. ✔ Number of unique words

C. ✖ Number of duplicate words

D. ✖ Twice the number of duplicate words

Question Number : 53 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Library" dataset. What will (**A** - **B**) represent at the end of execution?

```
A = 0, B = 0
while (Pile 1 has more cards) {
    Read the first row X in Table 1
    Move X to Pile 2
    while (Pile 1 has more cards) {
        Read the first row Y in Table 1
        Move Y to Pile 3
        if (X.Genre == Y.Genre or X.Year == Y.Year) {
            A = A + 1
        }
        if (X.Genre == Y.Genre and X.Year == Y.Year) {
            B = B + 1
        }
    }
    Move all cards from Pile 3 to Pile 1
}
```

Options :

A. ✖ Number of pairs of books having the same genre but published in the different year

B. ✖ Number of pairs of books having the same genre and published in the same year

C. ✔ Number of pairs of books having either the same genre or published in the same year but not both

D. ✖ Number of pairs of books having neither the same genre nor published in the same year

Question Number : 54 Question Type : MSQ

Correct Marks : 5

Question Label : Multiple Select Question

The following pseudocode is executed using the "Words" dataset. At the end of execution, **Vmax** holds the maximum vowel count among all sentences. But the pseudocode may have mistakes. Identify all such mistakes (if any). It is a Multiple Select Question (MSQ).

```
1   Vmax = 10000
2   CountV = 0
3   while (Table 1 has more rows) {
4       Read the first row X in Table 1
5       CountV = countSomething(X, CountV)
6       if (X.Word ends with a full stop) {
7           if (CountV > Vmax) {
8               Vmax = Vmax + 1
9           }
10      }
11      CountV = 0
12      Move the row X to Table 2
13  }

14  Procedure countSomething(Y, A)
15      i = 0
16      while (i ≤ Y.LetterCount) {
17          if (i^th letter of Y.Word is vowel) {
18              A = A + 1
19          }
20          i = i + 1
21      }
22      return (A)
23  End countSomething
```

Options :

A. ✔ Line 1, incorrect initialization of **Vmax**

B. ✖ Line 7, incorrect if condition

C. ✔ Line 8, invalid update of **Vmax**

D. ✔ Line 11, misplaced re-initialization of **CountV**

E. ✔ Line 15, incorrect initialization of **i**

F. ✖ Line 20, incorrect increment of **i**

G. ✖ Line 22, incorrect return value

H. ✖ No error

Question Number : 55 Question Type : MSQ

Correct Marks : 5

Question Label : Multiple Select Question

The following pseudocode is executed using the "Olympics" dataset. It counts the number of pairs

of distinct players who won the same medal but from different gender. Assume that no player has won more than one medal. But the pseudocode may have mistakes in one or more lines. Identify all such lines (if any). It is a Multiple Select Question (MSQ).

```
1   while (Table 1 has more rows) {
2       Read the first row X in Table 1
3       if (X.Gender == 'M') {
4           Move X to Table M
5       }
6       if (X.Gender == 'F') {
7           Move X to Table M
8       }
9   }
10  count = common(Table M) + common(Table F)

11  Procedure common(Table T1)
12      A = 1
13      while (Table T1 has more rows) {
14          Read the first row X in Table T1
15          Move X to Table T2
16          while (Table T2 has more rows) {
17              Read the first row Y in Table T1
18              Move Y to Table T3
19              if (X.Name == Y.Name and X.Medal ≠ Y.Medal) {
20                  A = A + 1
21              }
22          }
23          Move all rows from Table T3 to Table T1
24      }
25      return(A)
26  End common
```

Options :

A. ✖ Line 3, incorrect if condition

B. ✔ Line 7, moved to incorrect table

C. ✖ Line 10, incorrect update of **count**

D. ✔ Line 12, incorrect initialization of **A**

E. ✔ Line 16, incorrect while condition

F. ✔ Line 19, incorrect if condition

G. ✖ Line 20, incorrect increment of **A**

Statistics for Data Science - 1

Number of Questions : 15

Section Marks : 50

Question Number : 56 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

The age of the participants in a dance competition are plotted in a stem and leaf plot as shown in Figure 1.2.Q.

Stem	Leaf
1	8 9
2	0 1 3 5 5
3	0 5
4	1

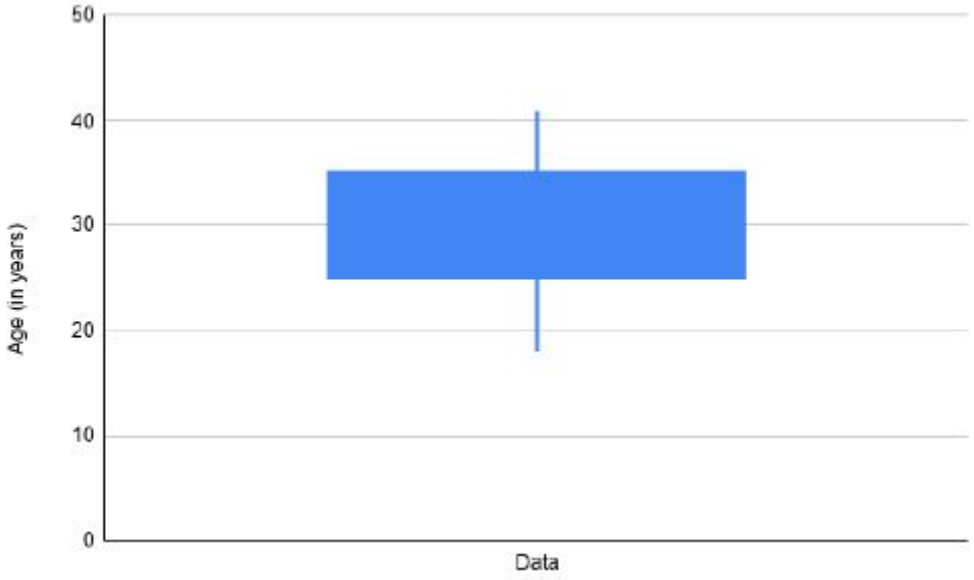
Here 2 | 3 represents 23 years.

Figure 1.2.Q: Age of participants

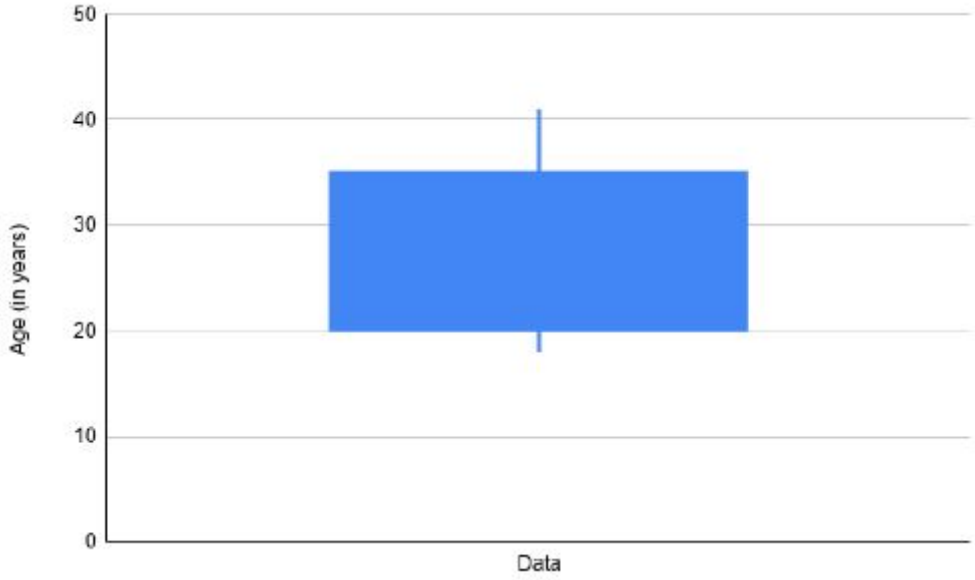
Choose the correct box plot representation of the data given in Figure 1.2.Q.

Options :

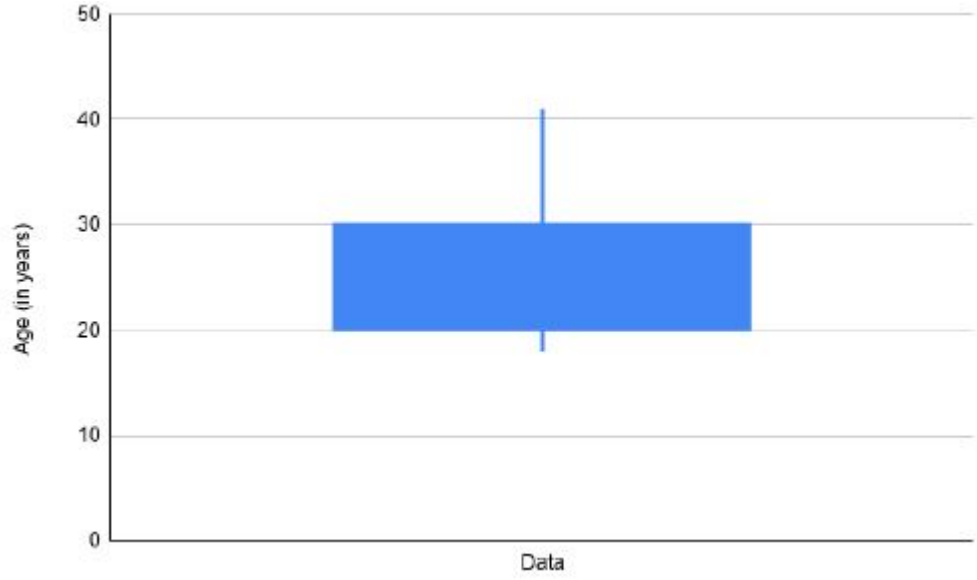
A. ✖



B. ✖



C. ✔



D. ✖ Box plot can not be plotted for the given data.

Question Number : 57 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

What is the value of population standard deviation of the first 2*n* natural numbers (1, 2, 3, ... , 2*n* - 2, 2*n* - 1, 2*n*)?

Options :

A. ✔ $\sqrt{\frac{4n^2-1}{12}}$

B. ✖ $\sqrt{\frac{n^2-1}{12}}$

C. ✖ $\sqrt{\frac{4n^2-1}{6}}$

D. ✖ $\sqrt{\frac{n^2-1}{6}}$

Question Number : 58 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

In the last 5 innings of a school cricket tournament, Manish scored 4, 6, 12, 14, and 16 runs. The population mean and the population variance of the scores of his last 7 innings are 10 and 16 respectively. What are the remaining two scores?

Options :

A. ✖ 9 and 9

B. ✖ 7 and 11

C. ✔ 8 and 10

D. ✖ 12 and 6

Question Number : 59 Question Type : MCQ

Correct Marks : 5

Question Label : Multiple Choice Question

A free mega health checkup is conducted by a clinic at Olympia society. The systolic blood pressure (in mm Hg) of participants is listed in Table 1.1.Q. Calculate the approximate mean value of systolic blood pressure.

Systolic blood pressure (in mm Hg)	Frequency	Relative frequency
100-110	x	0.1
110-120	y	0.125
120-130	8	0.2
130-140	z	m
140-150	7	0.175
150-160	3	0.075

Table 1.1.Q: Systolic blood pressure of participants.

Options :

A. ✔ 130.75

B. ✖ 130.25

C. ✖ 130

D. ✖ 120.25

Question Number : 60 Question Type : MSQ

Correct Marks : 2

Question Label : Multiple Select Question

Consider various variables that describe the specifications of mobile phones in a store. These variables include the brands, internal storage (in GB), display size (in inches), price (in rupees), support (3G, 4G, 5G), and sim slots type (single, dual). The specifications for different mobile phones are listed in a table. Based on the given information, choose the correct statement(s) from

the following:

Options :

A. ✔ Display size (in inches), internal storage (in GB), and price (in rupees) are numerical variables.

B. ✖ Brands of mobile phones have the ordinal scale of measurement and internal storage (in GB) have the ratio scale of measurement.

C. ✔ Brands of mobile phones have the nominal scale of measurement and internal storage (in GB) have the ratio scale of measurement.

D. ✖ Support (3G, 4G, 5G) is a numerical variable.

Question Number : 61 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

If mean, median, and mode of a numerical variable is the same, then:

Options :

A. ✖ All observations must have the same value as mean.

B. ✖ The standard deviation of the numerical variable must be zero.

C. ✔ All observations need not have the same value as mean.

D. ✔ The standard deviation of the numerical variable need not be zero.

Question Number : 62 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

Which of the following options represent(s) time series data? (More than one option could be correct.)

Options :

A. ✔ The profit of a company per year from the year 2008 to 2020.

B. ✔ The electricity bill of a household for each month of 2020.

C. ✖ The price of petrol at different cities of India on 1^{st} of April 2020.

D. ✔ The prices of stocks of a company recorded at the end of each month in the year 2020.

Question Number : 63 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

The tax paid by 100 employees of a company is given in a dataset. If the tax details of 200 more employees are added to the same dataset, then which among the following about the range will hold true? (More than one options could be correct)

Options :

A. ✔ The value of the range of the new dataset may exceed the value of the range of the previous dataset.

B. ✖ The range of the new dataset can be smaller than the range of the previous dataset.

C. ✖ The range of the new dataset will never exceed the range of the previous dataset.

D. ✖ There will always be some effect on the value of the range after adding the data of 200 more employees in the table.

Question Number : 64 Question Type : MSQ

Correct Marks : 5

Question Label : Multiple Select Question

If the population standard deviation of the first $2n$ natural numbers (excluding zero) is s_1, the population standard deviation of the next $2n$ natural numbers is s_2, and the population standard deviation of the first $4n$ natural numbers (excluding zero) is s_3, then which of the following statements is/are true?

Options :

A. ✖ $s_1 > s_2$

B. ✔ $s_2 = s_1$

C. ✖ $s_2 > s_3$

D. ✖ $s_1 > s_3$

E. ✔ $s_1 = s_2 < s_3$

Question Number : 65 Question Type : SA

Correct Marks : 2

Question Label : Short Answer Question

If there are two variables x and y, each having n data points, where each data point is obtained by $x_i = i, y_i = n + i$, what is the correlation coefficient of x and y?

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 :

1

Question Number : 66 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

The stem and leaf plot of the weights of 10 wrestlers is shown in Figure 1.1.Q.

Stem	Leaf
5	8 9
6	3 4 5
7	2 6 9
8	3 4

Here 6 | 2 represents 62 kg.

Figure 1.1.Q: Weights of wrestlers

What is the mean weight (in kg) of the data given in Figure 1.1.Q? (Correct up to 1 decimal point accuracy.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

70.3

Question Number : 67 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

In an organization, the manager wants to find out the relation between gender and salary earned. He calculated the absolute value of point bi-serial correlation coefficient and found it to be equal to 0.65. In the next quarter, the salary of every employee is doubled. What will be the absolute value of point bi-serial correlation coefficient after the salary is doubled? (Correct up to 2 decimal point accuracy.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.65

Question Number : 68 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

The histogram in Figure 1.4.Q represents the marks distribution of 50 students of college *XYZ* in their Statistics quiz.

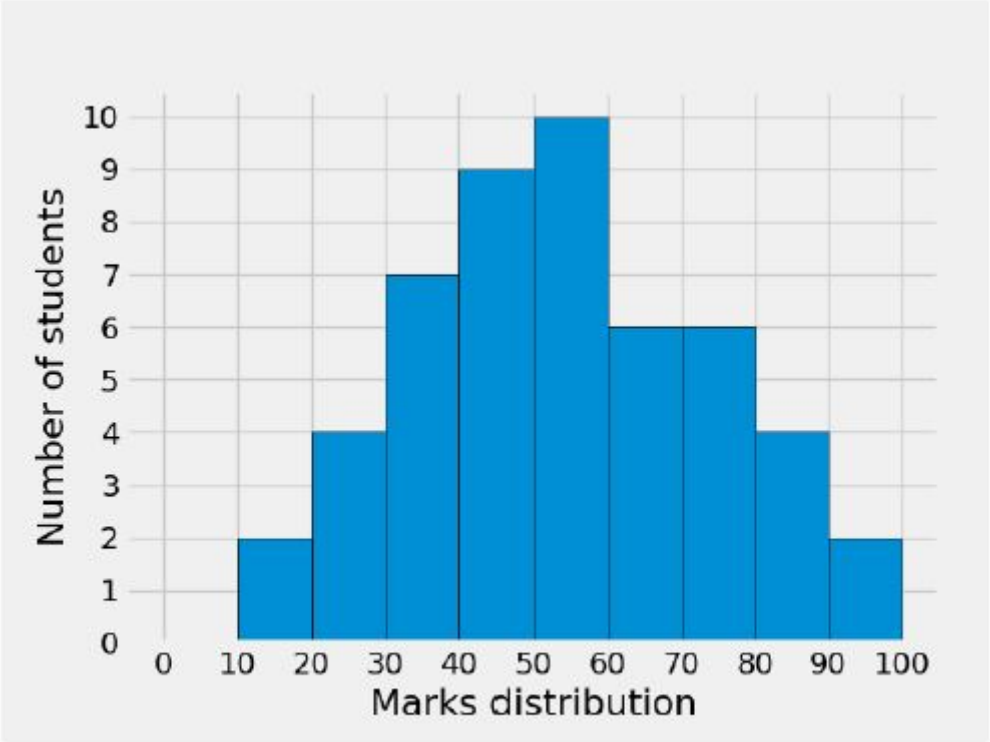


Figure 1.4.Q: Marks distribution in Statistics quiz

Find the approximate value of mean of the marks scored by students.

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 :

54

Question Type : COMPREHENSION

Question Numbers : (69 to 70)

Question Label : Comprehension

In a college, the gender distribution of college faculty is given as stacked bar chart in Figure 1.3.Q. There are three designation for faculty: assistant professor, associate professor, and professor.

The total number of assistant professors, associate professors and professors are 200, 150, and 100 respectively. Based on this information, answer the subquestions.

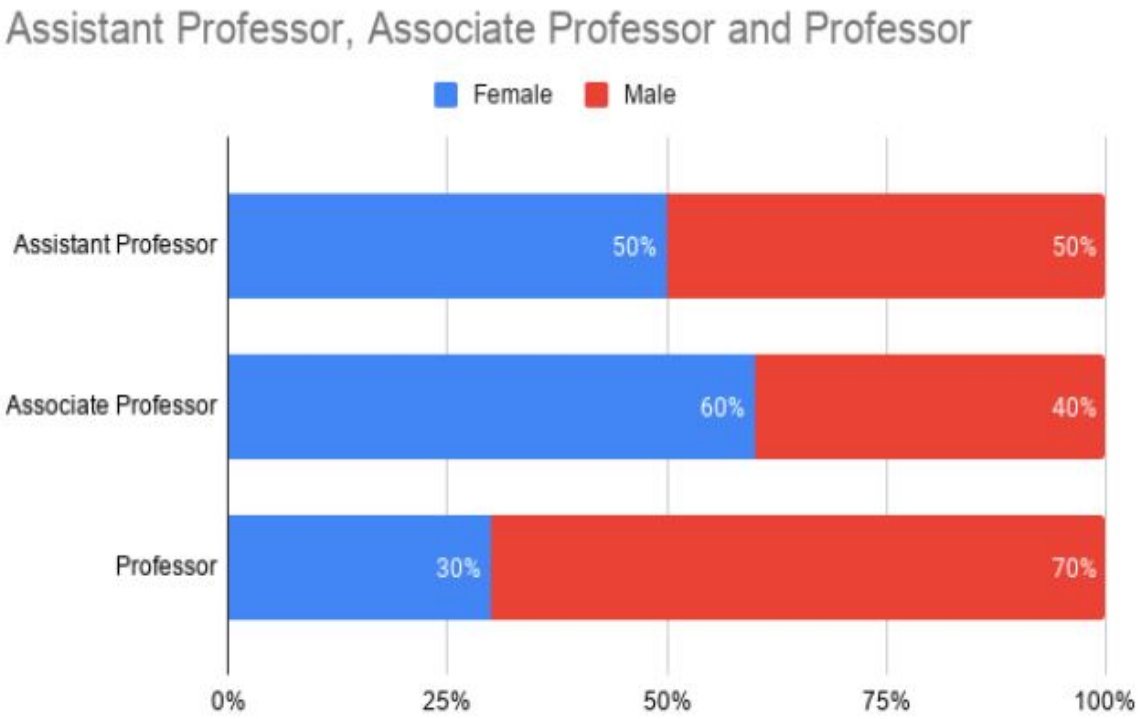


Figure 1.3.Q: Gender distribution in a college.

Sub questions

Question Number : 69 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

What is the median of faculty designation?

Options :

A. ✔ Associate Professor

B. ✖ Assistant Professor

C. ✖ Professor

D. ✖ Median is not defined for the faculty designation

Question Number : 70 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

Choose the correct option(s) from the following statements about the dataset given in Figure 1.3.Q.

Options :

A. ✔ Gender is associated with the faculty designation.

B. ✖ Gender is not associated with faculty designation.

C. ✖ Percentage of overall male faculty in the college is 65.

D. ✔ There is a total of 220 female faculty in the college.

Question Type : COMPREHENSION

Question Numbers : (71 to 72)

Question Label : Comprehension

Use the information given below to answer the subquestions.

An online retailer shop uses 4 different types of delivery services (A, B, C, and D) to deliver the products to their customers. The contingency table, Table 1.2.Q shows the number of items that were received damaged when shipped by 4 different delivery services.

Damage	Delivery services			
	A	B	C	D
Yes	80	40	70	20
No	120	200	190	180

Table 1.2.Q: Delivery services

Sub questions

Question Number : 71 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

On the basis of the information given in Table 1.2.Q, select the correct statement(s) from the following:

Options :

A. ✔ Receiving the damaged item is associated with the type of delivery services used.

B. ✖ Receiving the damaged item is not associated with the type of delivery services used.

C. ✔ If the manager of the retailing shop wants to reduce the number of complaints regarding the damaged items received, he should prefer delivery service of type *D*.

D. ✖ If the manager of the retailing shop wants to reduce the number of complaints regarding the damaged items received, he should prefer delivery service of type *B*.

Question Number : 72 Question Type : MCQ

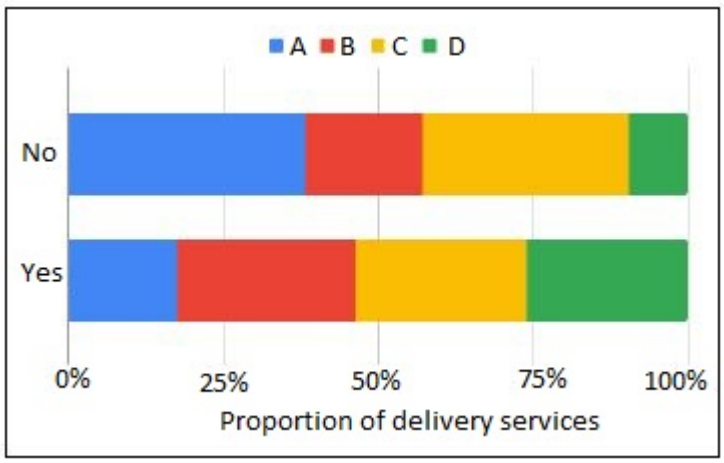
Correct Marks : 2

Question Label : Multiple Choice Question

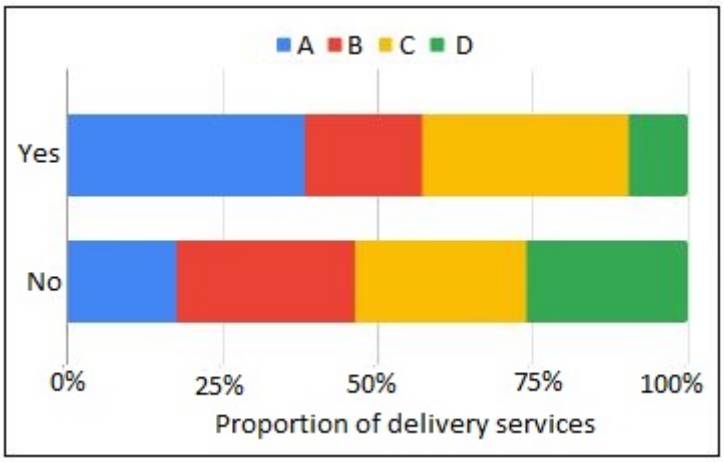
Identify the correct stack bar chart representing the column relative frequencies of the damage status of items from different delivery services from Table 1.2.Q.

Options :

A. ✖

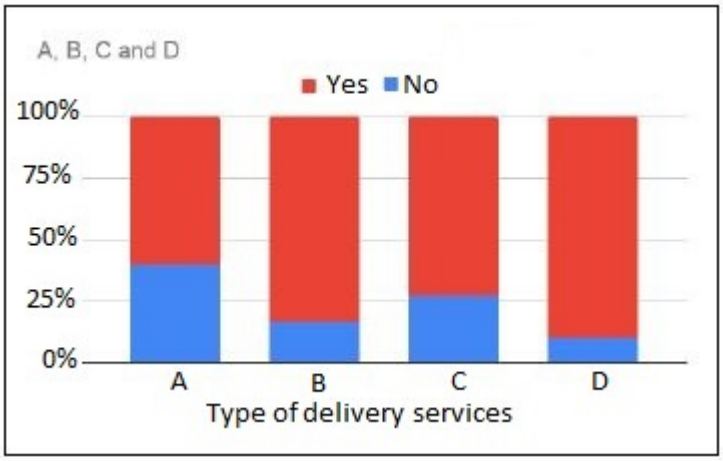


B. ✖



C. ✔

D. ✖



Mathematics for Data Science - 1

Number of Questions :	11
Section Marks :	50
Enable Mark as Answered Mark for Review and	Yes

Clear Response :

Question Number : 73 Question Type : MCQ

Correct Marks : 0

Question Label : Multiple Choice Question

- Notations:
  - $\mathbb{R}$ = Set of real numbers.
  - $\mathbb{Q}$ = Set of rational numbers
  - $\mathbb{Z}$ = Set of integers.
  - $\mathbb{N}$ = Set of natural numbers.
  - A^c= Complement of a set A.
- The set of natural numbers includes 0.
- Note: when you are doing calculation, consider a number upto its 2 decimal places. E.g. 1.2345 will be considered as 1.23

Options :

A. ✔ Useful Data has been mentioned above.

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

Question Type : COMPREHENSION

Question Numbers : (74 to 75)

Question Label : Comprehension

Answer the given subquestions.

Sub questions

Question Number : 74 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

If a Cartesian product
$B \times A = \{(2,5),(2,6),(3,5),(3,6),(4,5),(4,6)\}$,
then correctly identify the sets A and B
from the following:

Options :

A. ✖ $A = \{4,5,6\}, B = \{5,6\}$

B. ✖ $A = \{5,6\}, B = \{4,5,6\}$

C. ✖ $A = \{2,3,4\}, B = \{5,6\}$

D. ✔ $A = \{5,6\}, B = \{2,3,4\}$

Question Number : 75 Question Type : MSQ

Correct Marks : 6

Question Label : Multiple Select Question

Consider the sets A, B from
previous question and a third
set $C = \{x \mid x \in \mathbb{N}, x$ is a
prime number less than $10\}$.
Consider the universal set to
be $U = \{x \mid x \in \mathbb{N}, x$ is less
than $10\}$. Which of the following
options are correct?

Options :

A. ✔ $(B \times B) \cap (C \times C)$ is a non empty set

B. ✖ $A \times A$ is a subset of $B \times B$

C. ✔ Cardinality of $B^c \cup C$ is greater than that of B

D. ✖ $A \cap C^c$ is an empty set

Question Number : 76 Question Type : MSQ

Correct Marks : 6

Question Label : Multiple Select Question

Consider Table 3 shown below consisting of research data relating two variables x and y. Use SSE method to fit a straight line mapping between the two variables of the form: $y = mx + c$ where m, c are real constants. Consider the following three straight line fits:

Fit1: $y = 0.6x + 8$
Fit2: $y = 1.5x + 8$
Fit3: $y = x + 5$

Which of the following options is/are correct ?

x	y
-2	5
-5	3
1	7
3	10

Table 3:

Options :

A. ✔ Fit1 has the lowest SSE

B. ✖ Fit2 is a better fit compared to Fit3

C. ✖ Fit3 is a better fit compared to Fit1

D. ✔ Fit1 is better than Fit2 and Fit3 is better than Fit2

E. ✖ Fit3 has the lowest SSE

Question Number : 77 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

A general form of a quadratic function is given by $f(x) = a(x-h)^2 + k$, where $x \in \mathbb{R}$, $a \neq 0$, h, k are real numbers. Which of the following options are correct?

Options :

A. ✔ The vertex of the parabola is given by the point (h, k)

B. ✖ The vertex of the parabola is given by the point $(0, k)$

C. ✖ The range of the function is given by $\{y \in \mathbb{R} \mid y \leq k\}$, when $a > 0$

D. ✔ The range of the function is given by $\{y \in \mathbb{R} \mid y \leq k\}$, when $a < 0$

E. ✖ f is injective

Question Number : 78 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

Let A be the set of all functions from $\mathbb{N}$ to $\mathbb{N}$. Let us define a relation R on A as follows, $R = \{(f, g) \in A \times A : f(3) = g(3) \text{ or } f(12) = g(12)\}$.

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

Options :

A. ✔ R is a reflexive relation.

B. ✔ R is a symmetric relation.

C. ✖ R is a transitive relation.

D. ✖ R is an equivalence relation.

Question Number : 79 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

An electron moves in an electric field following the path $x^2 = 12y$. For any point (a, b) on the path, where $a = 2b$, a signal is received by Amal. For which of the following coordinates will Amal receive a signal?

Options :

A. ✖ (2, 1)

B. ✖ (48, 24)

C. ✔ (0, 0)

D. ✔ (6, 3)

Question Number : 80 Question Type : MSQ

Correct Marks : 4

Question Label : Multiple Select Question

Value of a quadratic function $f(x)$ increases over the interval $(-\infty, -2)$ and decreases over the interval $(-2, \infty)$. Also, $f(0) = f(-4) = 23$. Which of the following statements about $f(x)$ can be true?

Options :

A. ✖ $f(x)$ is an injective function.

B. ✖ $f(x)$ is a surjective function where the domain and co-domain both are the sets of real numbers: $\mathbb{R}$.

C. ✔ $f(x) = ax^2 + (4a)x + 23$, where $a < 0$

D. ✔ $f(x)$ can be $-3x^2 - 12x + 23$

E. ✔ $f(x)$ can be $-2(x + 2)^2 + 31$

Question Number : 81 Question Type : SA

Correct Marks : 3

Question Label : Short Answer Question

Two good friends A and B work in two different retail shops. In addition to a fixed pay of ₹820 per day, A makes ₹120 for every item he sells. In addition to a fixed pay of ₹760 per day, B makes ₹150 for every item she sells. Both A and B sell equal number of items and earn equal amount (in ₹) every day of a month (30 days). How many items would each have sold after thirty days ?

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 :

60

Question Type : COMPREHENSION

Question Numbers : (82 to 83)

Question Label : Comprehension

Consider the tables 1 and 2 below consisting of mathematical statements / questions (Table 'Statement (S)') and answers (Table 'Answer (A)'). Answer the given subquestions based on the tables.

Statement No.	Statement (S)
S1	Three points in the coordinate plane will be collinear if the area of the triangle formed by the three points is zero
S2	Equation of a straight line passing through a point, which is at the intersection of two lines ℓ_1 and ℓ_2, can be obtained in the form: $\ell_1 + r\ell_2 = 0$, where r is a real number
S3	Two quadratic equations are given by $x^2 - 10x + 3k = 0$ and $x^2 - 14x + 6k = 0$, where k is a real number. If these two equations have exactly one root in common, then what will be the value of k ?
S4	Slope at a point on the parabola can never be 0
S5	$(2, 3)$ is equidistant from the lines $x + y - 4 = 0$ and $x + 7y - 18 = 0$

Table 1

Answer No.	Answer (A)
A1	True
A2	$k = 8$
A3	False
A4	$k = 6$

Table 2

Sub questions

Question Number : 82 Question Type : MSQ

Correct Marks : 8

Question Label : Multiple Select Question

Consider the possible mapping between the columns 'Statement (S)' and 'Answer (A)'. The labels of each element in S and A are marked by S1-S5 and A1-A4. Which of the following matches are correct?

Options :

A. ✔ S1, S2 and S5 are mapped to A1

B. ✔ S3 is mapped to A2 while S4 is mapped to A3

C. ✖ S1, S2 and S4 are mapped to A1

D. ✖ S3 is mapped to A4 and S5 is mapped to A3

E. ✔ The mapping from S to A is a function

Question Number : 83 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Consider the possible mapping between the columns 'Statement (S)' and 'Answer (A)'. The labels of each element in S and A are marked by S1-S5 and A1-A4. Which one of the following options is correct?

Options :

A. ✖ The functional mapping from S to A is one-one but not onto

B. ✖ The functional mapping from S to A is onto but not one-one

C. ✔ The functional mapping from S to A is neither one-one nor onto

D. ✖ The functional mapping from S to A is bijective

E. ✖ None of these: The mapping from S to A is not a function

Question Number : 84 Question Type : MCQ

Correct Marks : 5

Question Label : Multiple Choice Question

3 toys are kept on ground in such a way that their coordinates $M(-2,5), N(4,-2)$ and $P(-3,3)$ form a $\triangle MNP$. Bimal moves the toys in a way such that all 3 sides of the triangle move 1 unit inwards to form a $\triangle QRS$. Now consider three lines, l_1 (the line which passes through the points S and Q), l_2 (passing through the points S and R) and l_3 (passing through the points Q and R). Which of the following options give the equation of the line (among l_1, l_2, l_3) that is at the maximum distance from the origin [(0,0)]?

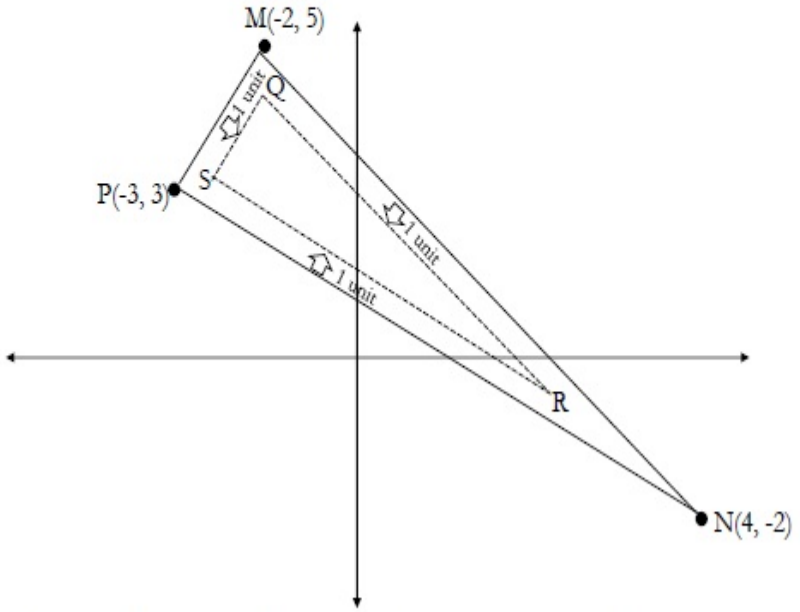


Figure 1: Here MN is parallel to QR, PN is parallel to SR and MP is parallel to QS.

Options :

A. ✖ $3y + 5x - 7 = 0$

B. ✖ $7x + 6y - 16 = 0$

C. ✖ $y - 2x - 9.87 = 0$

D. ✔ $y - 2x - 6.76 = 0$

Question Number : 85 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

Find the value of the constant *m* for which a particle travelling along the curve $y = x^2 - 4x + m$

touches the *X*-axis only once.

Options :

A. ✖ 3

B. ✖ 1

C. ✔ 4

D. ✖ 2