

IIT M QUALIFIER EXAM POD21QFBQPA

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 POD21QFBQPA
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 given subquestions

Chronic Traumatic Encephalopathy Concussions are brain injuries that occur when a person receives a blow to the head, face, or neck. Although most people who suffer a concussion experience initial bouts of dizziness, nausea, and drowsiness, these symptoms often disappear after a few days. The long-term effects of concussions, however, are less understood and far more severe. Recent studies suggest that people who suffer multiple concussions are at significant risk for developing chronic traumatic encephalopathy (CTE), a degenerative brain disorder that causes a variety of dangerous mental and emotional problems to arise weeks, months, or even years after the initial injury. These psychological problems can include depression, anxiety, memory loss, inability to concentrate, and aggression. In extreme cases, people suffering from CTE have even committed suicide or homicide. The majority of people who develop these issues are athletes who participate in popular high-impact sports, especially football. Although both new sports regulations and improvements in helmet technology can help protect players, the sports media and fans alike bear some of the responsibility for reducing the incidence of these devastating injuries. Improvements in diagnostic technology have provided substantial evidence to link severe—and often fatal—psychological disorders to the head injuries players receive while on the field. Recent autopsies performed on the brains of football players who have committed suicide have shown advanced cases of CTE in every single victim. In response to the growing understanding of this danger, the National Football League (NFL) has revised its safety regulations. Players who have suffered a head injury on the field must undergo a "concussion sideline assessment"—a series of mental and physical fitness tests—before being allowed back in the game. In an effort to diminish the amount of head and neck injuries on the field, NFL officials have begun enforcing stricter penalty calls for helmet-to-helmet contact, leading with the head, and hitting a defenceless player. Furthermore, as of 2010, if a player's helmet is accidentally wrenched from his head during play, the ball is immediately whistled dead. There is hope that these new regulations, coupled with advances in helmet design, will reduce the number of concussions player endure and thus curb the number of CTE cases. Efforts by the NFL and other professional sports leagues are certainly laudable; indeed, we should commend every attempt to protect the mental and physical health of players. However, new regulations at the professional level cannot protect amateur players, especially young people. Fatal cases of CTE have been reported in victims as young as 21. With appropriate equipment and form, tackling need not be dangerous. Proper tackling form—using the arms and shoulders to aim for a player's midsection rather than leading with the top of the head—should be taught at an early age. Youth, high school, and college leagues should also adopt safety rules even more stringent than the NFL's. Furthermore, at an early age, athletes should be educated about the serious dangers of head injuries. Perhaps the most important factor in reducing the number of traumatic brain injuries, however, lies not with the players, the coaches, or the administrators, but with the media and fans. Sports media producers have become accustomed to showcasing the most aggressive tackles and the most intense plays. NFL broadcasts often replay especially violent collisions, while the commentators marvel at the physical prowess of the players involved. Some sports programs even feature weekly countdowns of the hardest hits. When the media exalts such hazardous behavior, professionals are rewarded for injuring each other on the field, and amateurs become more likely to try to imitate their favorite NFL athletes. Announcers, commentators, television producers, and sportswriters should engage in a collective effort to cease glorifying brutal plays. In turn, fans should stop expecting their favorite players to put their lives on the line for the purposes of entertainment. Players must stop being encouraged to trade their careers, health, happiness, and their lives for the sake of a game.

Sub questions

Question Number : 1 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Choose the odd one out:

Options :

- A. ✓ Homicide
- B. ✗ Nausea
- C. ✗ Dizziness
- D. ✗ Drowsiness

Question Number : 2 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

The act of intentionally causing one's own death is _____.

Options :

- A. ✓ Suicide
- B. ✗ Homicide
- C. ✗ Both Suicide and Homicide

Question Number : 3 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

The word that means "a post-mortem examination to discover the cause of death or the extent of disease" is _____.

Options :

- A. ✗ Degenerative
- B. ✓ Autopsy

C. ✖ Concussion

D. ✖ Wrench

Question Number : 4 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

The antonym of the word amateur is _____.

Options :

A. ✖ Young

B. ✖ Old

C. ✔ Expert

D. ✖ Unprofessional

Question Number : 5 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Which among the following statements is false?

Options :

A. ✖ Concussions (at times) could be fatal.

B. ✖ The usual victims of CTE are athletes involved in high impact sport.

C. ✔ NFL broadcasts should glorify the violent collisions to bring respect and inspiration among the public towards the athletes.

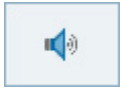
D. ✖ Concussions may lead to psychological problems.

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_qualifier1.mp3

Sub questions

Question Number : 6 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

The earliest form of English spoken in the Middle ages is called Anglo-Saxon English.

Options :

A. ✓ TRUE

B. ✗ FALSE

Question Number : 7 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Anglo-Saxon English is the Standard British English that we speak today.

Options :

A. ✗ TRUE

B. ✓ FALSE

Question Number : 8 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Many words in English are from Latin and Greek.

Options :

A. ✓ TRUE

B. ✗ FALSE

Question Number : 9 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Romans, Viking and Germanic Saxons have invaded Britain in the past.

Options :

A. ✓ TRUE

B. ✗ FALSE

Question Number : 10 Question Type : MCQ

Correct Marks : 2

Question Label : Multiple Choice Question

Old English comprises more than 80% of the written English language that we use today.

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.

Australia's role 1. _____ (in/on/at/ from) the First World War, or the Great War as it was known
2. _____ (until/ untill/ unless/ for) 1939, is central to the development of modern Australia's vision of itself in the world. It has served to create what is in some ways a second founding of the nation in the Gallipoli campaign and on the battlefields of France and Belgium. The influence of

the war experience in the First and Second World War 3. _____ (is/ are) evident in how ANZAC day is, perhaps even more than Australia day, the country's national day. When the war broke 4. _____ (into/out/on/up) in 1914, it was a certainty that, because of longstanding economic, family and defence ties, Australia, along with New Zealand, would stand alongside Britain. The 5. _____ (after/then/beforehand) Prime Minister Andrew Fisher was quick to pledge the country's support to "the last man, the last shilling". This was no idle promise, and Australia paid a high price for their loyalty to their colonizers.

Most of the ANZAC force was 6. _____ (send/sent) to Europe, but the Australian Light Horse remained to fight Turkish forces in Palestine and Syria. They 7. _____ (defeated/defended) the Suez Canal and advanced through Palestine and Syria. They also took part in what was one of the world's last great cavalry charges at Beersheba. The main ANZAC force arrived in Europe in 1916. The ANZAC experience was similar to that of the other participants in the war; a high death toll and little gain to be shown for it. Australian forces were present at all the major battles of the war and sustained some terrible casualties. For example, in 24 hours near Pozieres the 5th Division suffered 5,000 casualties. At the battle of Bullecourt, of the 3,000 men 8. _____ (who/whom) advanced, 2339 were killed, wounded or captured. By 1917 most of the officers were not professional soldiers. The most prominent example was General Sir John Monash, who was 9. _____ (a/ an)engineer by training. He 10. _____ (command/commands/commanded) the allied forces at the battle of Hamel so well that the general staff published the battle reports as a model.

At home, the war had a significant 11. _____ (affect/ effect) on the economy. Adverse effects included the end of British investment, the closure of many shipping lanes and the stockpiling of Australia's main export, wool. However, the isolation that resulted from the war meant that Australia had to make some things that had previously been imported. This led to the development of new industries. In addition, the BHP smelting company, which is now a 12. _____ (larger/major) Australian company, saw a great increase in demand for iron and steel. The needs of the war were a stimulus for the beginning of full industrialization in Australia. At the signing of the treaty of Versailles, 13. _____ (who/ which) marked the end of the war, Australia signed as a separate country. This reflected the fact that, at the cost of 60,000 dead, Australia had finally emerged 14. _____ (into/from) the shadow of Britain. The Great War was, perhaps, the 15. _____ (beginning/end) of modern Australian history.

Sub questions

Question Number : 11 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✓ in

B. ✗ on

C. ✗ at

D. ✗ from

Question Number : 12 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✓ until

B. ✗ untill

C. ✗ unless

D. ✗ for

Question Number : 13 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✓ is

B. ✗ are

Question Number : 14 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✖ into

B. ✔ out

C. ✖ on

D. ✖ up

Question Number : 15 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✖ after

B. ✔ then

C. ✖ beforehand

Question Number : 16 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✖ send

B. ✔ sent

Question Number : 17 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✖ defeated

B. ✔ defended

Question Number : 18 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✔ who

B. ✖ whom

Question Number : 19 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✖ a

B. ✔ an

Question Number : 20 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

- A. ✖ command
- B. ✖ commands
- C. ✔ commanded

Question Number : 21 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

- A. ✖ affect
- B. ✔ effect

Question Number : 22 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

- A. ✖ larger
- B. ✔ major

Question Number : 23 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

- A. ✖ who

B. ✓ which

Question Number : 24 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✗ into

B. ✓ from

Question Number : 25 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✓ beginning

B. ✗ end

Question Number : 26 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✓ 1

B. ✗ 2

C. ✗ 3

D. ✗ 4

Question Number : 27 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✖ dental

B. ✔ stop

Question Number : 28 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✖ TRUE

B. ✔ FALSE

Question Number : 29 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A. ✔ TRUE

B. ✖ FALSE

Question Number : 30 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

During a telephonic conversation, the expression "what's up man" should be strictly used in an informal context.

Options :

A.  TRUE

B.  FALSE

Question Number : 31 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

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

Options :

A.  TRUE

B.  FALSE

Question Number : 32 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

The 26 alphabets in English do not capture all the sounds in English.

Options :

A.  TRUE

B.  FALSE

Question Number : 33 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

The word 'shout' is monosyllabic.

Options :

A.  TRUE

B.  FALSE

Question Number : 34 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

The vowel sound present in the words "groom" is /uu/ and "look" is /u/.

Options :

A.  TRUE

B.  FALSE

Question Number : 35 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

Devansh_____like ice-creams.

Options :

A.  do not

B.  does not

Question Number : 36 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

During a telephonic conversation, the speaker's voice re-surfaces. Her voice is _____.

Options :

A.  Jarring

B. ✓ Echoing

Question Number : 37 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

The expression "hang up" (in the context of telephonic conversations) means

Options :

A. ✓ End a phone conversation by cutting the connection.

B. ✗ Ask a person to hold for sometime.

Question Number : 38 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

In English, the verb is not in the final position in a sentence.

Options :

A. ✓ TRUE

B. ✗ FALSE

Question Number : 39 Question Type : MCQ

Correct Marks : 1

Question Label : Multiple Choice Question

In the sentence, 'Baasma loves to dance', identify the verb.

Options :

A. ✓ Loves

B. ✗ Dance

Question Number : 40 Question Type : MCQ Is Question Mandatory : No Option Orientation :

Vertical

Correct Marks : 1

Question Label : Multiple Choice Question

In the word 'scheme', 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 "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
  if (X.PartOfSpeech == "Noun" and X.LetterCount > 6) {
    A = A + 1
  }
  Move X to Table 2
}
```

Options :

- A. ✗ Number of words which have more than 6 letters
- B. ✓ Number of nouns which have more than 6 letters
- C. ✗ Number of nouns which have less than 6 letters
- D. ✗ Number of words which have less than 6 letters

Question Number : 43 Question Type : MCQ

Correct Marks : 3

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Olympics" dataset. Assume that no player won more than one medal. 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.Nationality == Y.Nationality and X.Gender ≠ Y.Gender) {
      A = A + 1
    }
  }
  Move all cards from Pile 3 to Pile 1
}
```

Options :

- A. ✖ Number of pairs of players having different nationality but same gender
- B. ✖ Number of pairs of players having either same nationality or same gender
- C. ✔ Number of pairs of players having same nationality but different gender
- D. ✖ Number of pairs of players having same nationality and same gender

Question Number : 44 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

The following pseudocode is executed using the "Scores" dataset. What will **Count** represent at the end of execution? 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
    if (X.Mathematics == X.Physics or X.Gender == 'M') {
        Count = Count + 1
    }
}
```

Options :

- A. ✖ Number of male students whose Mathematics and Physics marks are same
- B. ✖ Number of male students + Number of students whose Mathematics and Physics marks are same
- C. ✔ Number of male students + Number of female students whose Mathematics and Physics marks are same
- D. ✔ Number of students whose Mathematics and Physics marks are same + Number of male students whose Mathematics and Physics marks are not same

Question Number : 45 Question Type : MSQ

Correct Marks : 3

Question Label : Multiple Select Question

The following pseudocode is executed using the "Olympics" dataset. **Count** represents the number of pairs of distinct players who won the same medal but not in the same sport. Assume that no player won more than one medal. 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
 }
 }
}`

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

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 = ith letter of X.Word
    if (A == B) {
        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 duplicate words
- B. ✖ Number of words which start and end with vowels
- C. ✖ Number of words which start and end with the same vowel

D. ✔ Number of words which start and end with the same 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 duplicate words

B. ✖ Number of words which start and end with vowels

C. ✔ Number of words which start and end with the same vowel

D. ✖ Number of words which start and end with the same letter

Question Number : 48 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

A palindrome is a sequence of characters which reads the same backward as forward, for example *level* and *noon*. The following pseudocode that counts palindromes is executed using the "Words" dataset. 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
    i = 1
    j = X.LetterCount
    Flag = True
    while (i < j and Flag) {
        *****
        *      Fill the code      *
        *****

        i = i + 1
        j = j - 1
    }
    if (Flag) {
        A = A + 1
    }
    Move X to Table 2
}

```

Options :

A. ✓ }
 if (i^{th} letter of **X.Word** \neq j^{th} letter of **X.Word**) {
 Flag = False

B. ✗ }
 if (i^{th} letter of **X.Word** \neq j^{th} letter of **X.Word**) {
 Flag = True

C. ✗ }
 if (i^{th} letter of **X.Word** $==$ j^{th} letter of **X.Word**) {
 Flag = True

D. ✗ }
 if (i^{th} letter of **X.Word** $==$ j^{th} letter of **X.Word**) {
 Flag = False

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. ✖ It is always zero
- B. ✖ Number of pairs of students who have different total marks
- C. ✖ Number of pairs of students who have same total marks
- D. ✖ Twice the number of pairs of students who have different total marks
- E. ✔ Twice the number of pairs of students who have same total marks

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 minimum Mathematics marks of a student whose

- (i) Total marks is more than the average total marks
- (ii) Mathematics marks is more 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 = 101  
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 3  
}  
else {  
    Move X to Table 2  
}
```

B. ✗

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

C. ✗

```

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

```

```

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

```

D. ✖

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 == "Adjective") {
        B = B + 1
    }
    if (X.PartOfSpeech == "Verb") {
        C = C + 1
    }
    if (X.Word ends with a full stop) {
        if (B ≥ 1 and C ≤ 2) {
            A = A + 1
        }
        B = 0, C = 0
    }
}

```

Options :

- A. ✖ Number of sentences with at most two adjectives and one verb
- B. ✖ Number of sentences with two adjectives and at least one verb
- C. ✖ Number of sentences with at least one verb and at most two adjectives
- D. ✔ Number of sentences with at least one adjective and at most two verbs

Question Number : 52 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Scores" 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.Physics == Y.Physics) {
            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 students who have the same Physics marks
- B. ✔ Number of students with unique Physics marks
- C. ✖ Number of students who do not have unique Physics marks
- D. ✖ Twice the number of pairs of students who have the same Physics marks

Question Number : 53 Question Type : MCQ

Correct Marks : 4

Question Label : Multiple Choice Question

The following pseudocode is executed using the "Scores" 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.Gender == Y.Gender or X.CityTown == Y.CityTown) {
            A = A + 1
        }
        if (X.Gender == Y.Gender and X.CityTown == Y.CityTown) {
            B = B + 1
        }
    }
    Move all cards from Pile 3 to Pile 1
}
```

Options :

- A. ✖ Number of pairs of students having same gender but from different City/Town
- B. ✖ Number of pairs of students having same gender and from same City/Town
- C. ✔ Number of pairs of students having either same gender or from same City/Town but not both
- D. ✖ Number of pairs of students having neither same gender nor from same City/Town

Question Number : 54 Question Type : MSQ

Correct Marks : 5

Question Label : Multiple Select Question

A sentence is said to be balanced if there are equal numbers of vowels and consonants in it. The following pseudocode is executed using the "Words" dataset. At the end of execution, **Bcount** counts the number of balanced sentences. But the pseudocode may have mistakes. Identify all such mistakes (if any). It is a Multiple Select Question (MSQ).

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

14 Procedure countSomething(Y, A, B)
15     i = 0
16     while (i ≤ Y.LetterCount) {
17         if (ith letter of Y.Word is vowel) {
18             A = A + 1
19         }
20         else {
21             B = B + 1
22         }
23         i = i + 1
24     }
25     return ([A, B])
26 End countSomething
```

Options :

- A. ✖ Line 2, incorrect initialization of **CountV** and **CountC**
- B. ✔ Line 7, incorrect if condition
- C. ✖ Line 8, invalid update of **Bcount**
- D. ✔ Line 11, misplaced re-initialization of **CountV** and **CountC**
- E. ✔ Line 15, incorrect initialization of **i**
- F. ✖ Line 21, incorrect increment of **B**
- G. ✖ Line 25, incorrect return value

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 players who have the same medal but different nationality. 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.Medal == "Gold") {
4          Move X to Table G
5      }
6      if (X.Medal == "Silver") {
7          Move X to Table S
8      }
9      if (X.Medal == "Bronze") {
10         Move X to Table B
11     }
12 }
13 count = common(Table G) + common(Table S) + common(Table B)

14 Procedure common(Table T1)
15     A = 1
16     while (Table T1 has more rows) {
17         Read the first row X in Table T1
18         Move X to Table T2
19         while (Table T2 has more rows) {
20             Read the first row Y in Table T1
21             Move Y to Table T3
22             if (X.Nationality == Y.Nationality) {
23                 A = A + 1
24             }
25         }
26         Move all rows from Table T3 to Table T2
27     }
28     return(A)
29 End common

```

Options :

- A. ✖ Line 3, incorrect if condition
- B. ✖ Line 13, incorrect update of **count**
- C. ✔ Line 15, incorrect initialization of **A**
- D. ✔ Line 19, incorrect while condition
- E. ✔ Line 22, incorrect if condition
- F. ✖ Line 23, incorrect increment of **A**
- G. ✔ Line 26, moved to incorrect table

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.

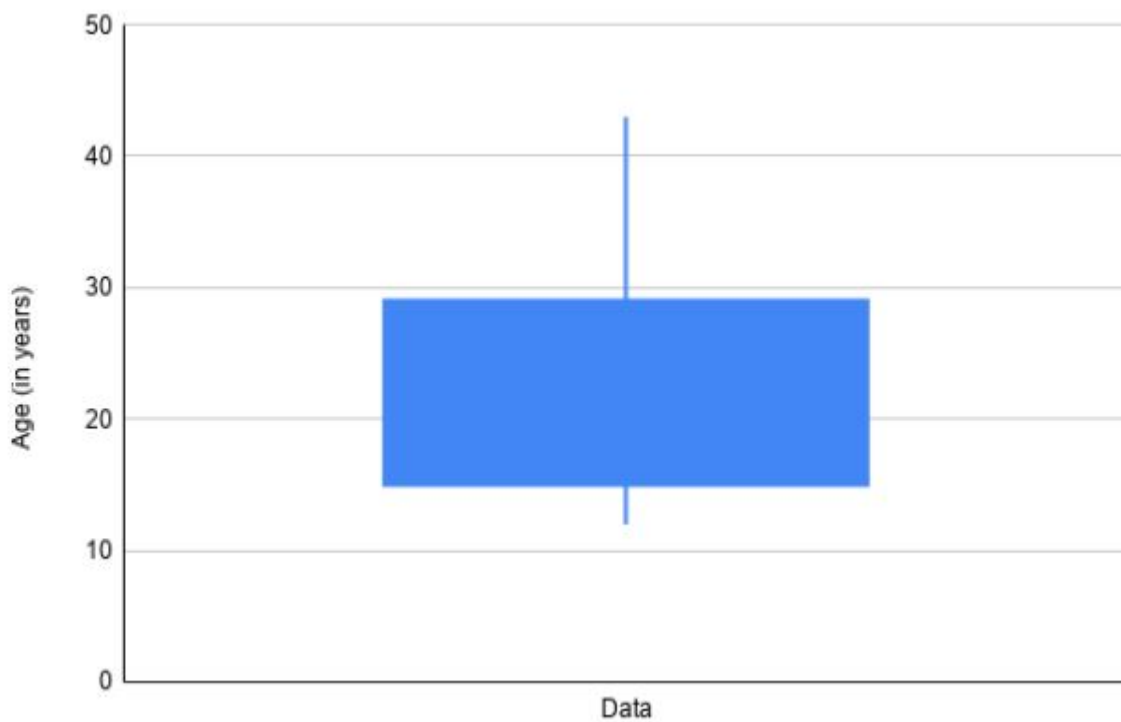
Stem	Leaf
1	2 4 5
2	2 7
3	1 5 6 7
4	3

Here 2 | 3 represents 23 years.

Figure 1.2.Q: Age of participants

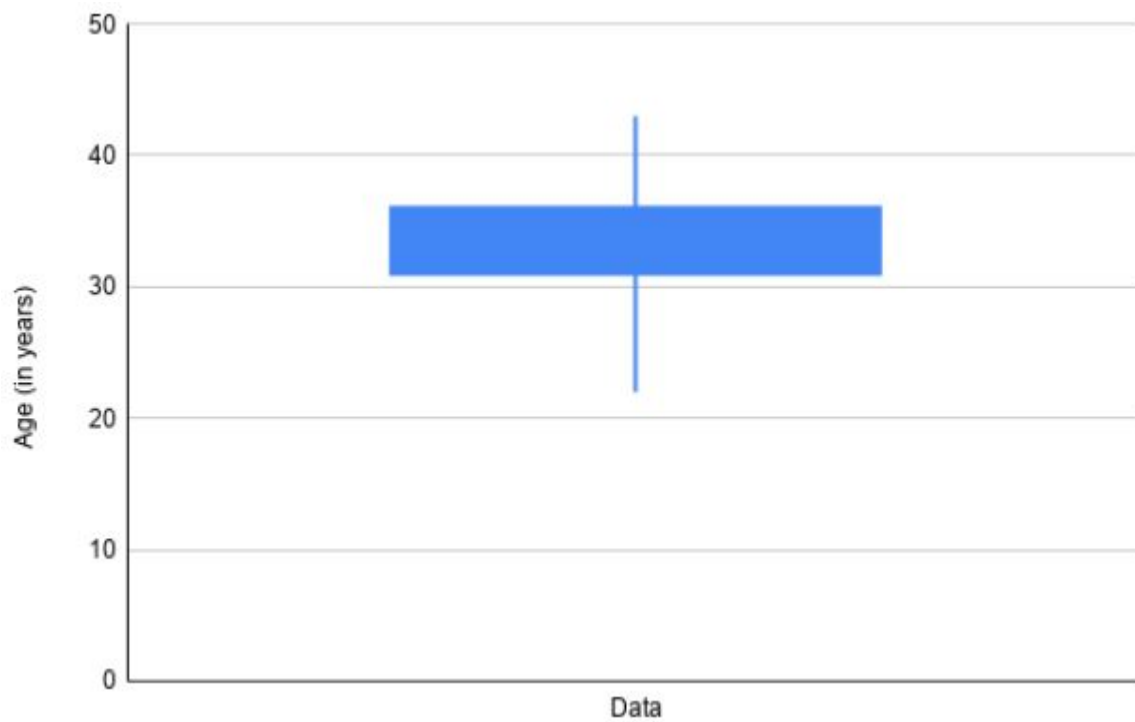
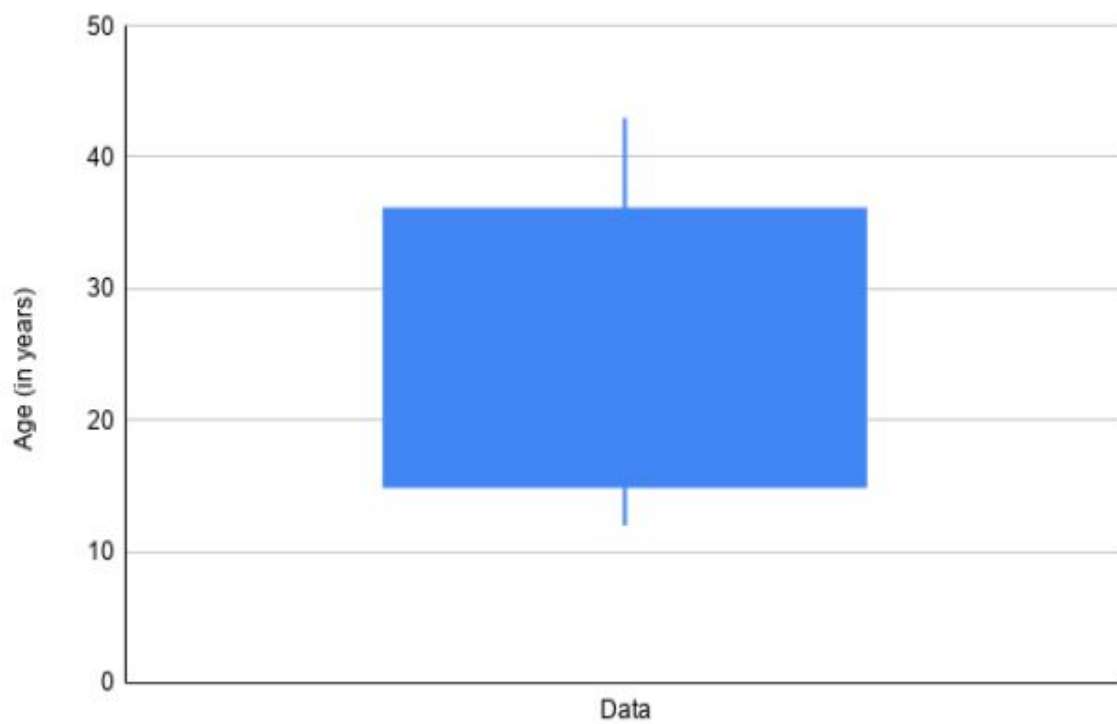
Choose the correct box plot representation of the data given in Figure 1.2.Q.

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 $2n$ natural numbers?

(1, 2, 3,, $2n - 2$, $2n - 1$, $2n$)?

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 2, 4, 10, 12, and 14 runs. The population mean and the population variance of the scores of his last 7 innings are 8 and 16 respectively. What are the remaining two scores?

Options :

A. ✗ 7 and 7

B. ✗ 10 and 4

C. ✓ 6 and 8

D. ✗ 9 and 5

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	4	0.1
110-120	x	0.125
120-130	y	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 (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), brands, sim slots (single, dual) are categorical variables.

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) cross-sectional 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 1st 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 option could be correct)

Options :

- A. ✓ The value of the range of the new dataset can never be smaller than 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 dataset.

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	6 7
6	2 8 9
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 :

70.6

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 0.7. In the next quarter, the salary of every employee is tripled. What will be the absolute value of point bi-serial correlation coefficient after the salary is tripled? (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 :

0.7

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.

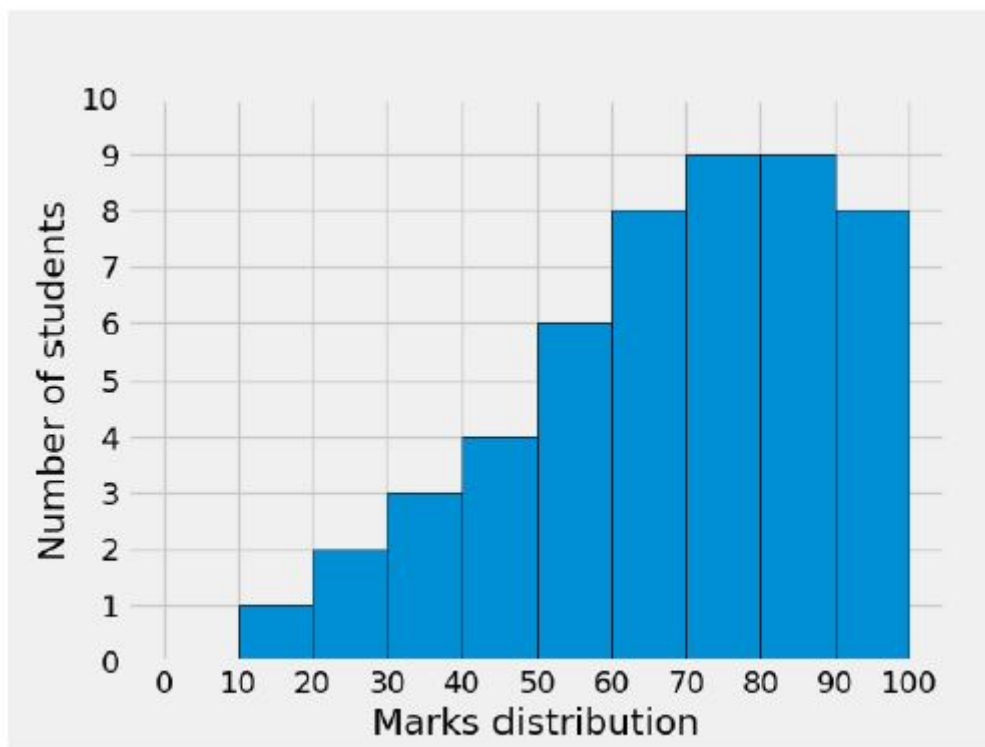


Figure 1.4.Q: Marks distribution in Statistics quiz

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 :

68

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 250, 100, and 50

respectively. Based on this information, answer the subquestions.

Gender distribution in the college

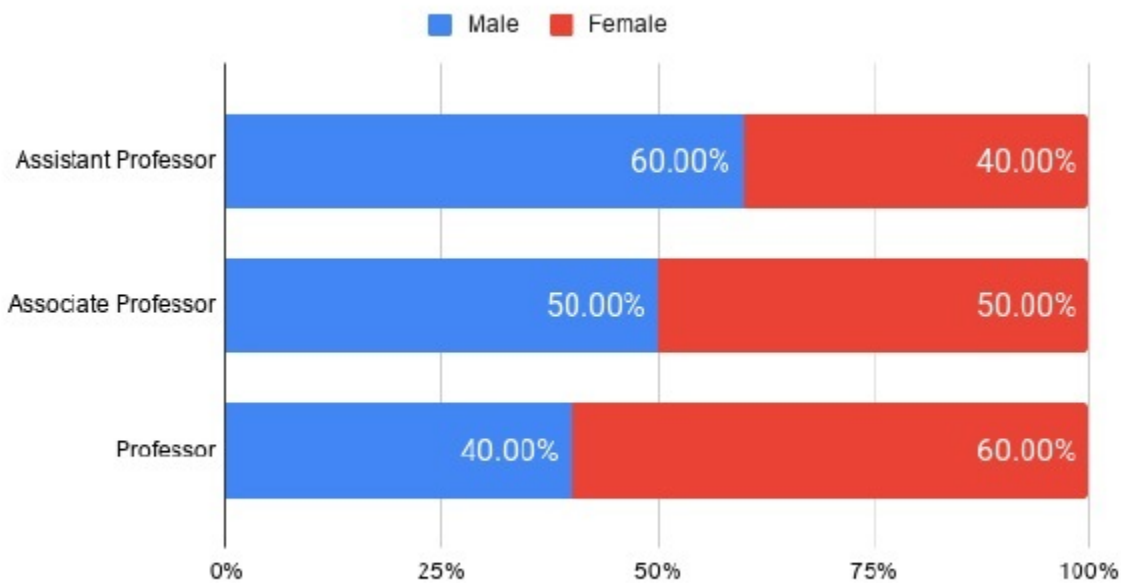


Figure 1.3.Q: Gender distribution in a college.

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 male faculty in the college.

Question Type : COMPREHENSION

Question Numbers : (71 to 72)

Question Label : Comprehension

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 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	40	20	35	10
No	60	100	95	90

Table 1.2.Q: Delivery services

Based on the given data, answer the subquestions.

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*.

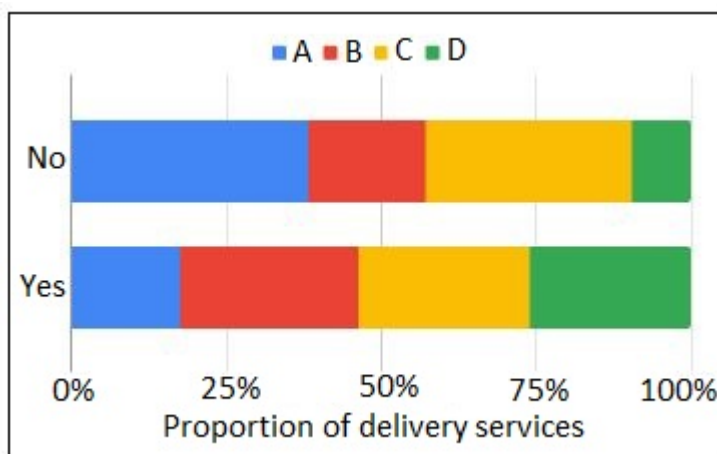
Question Number : 72 Question Type : MCQ

Correct Marks : 2

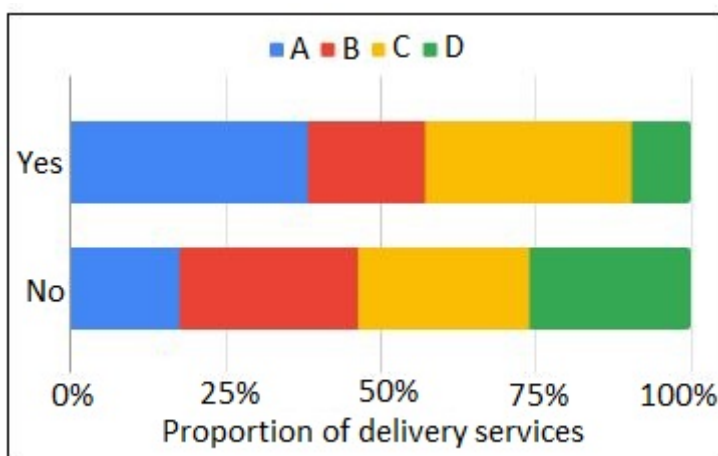
Question Label : Multiple Choice Question

Identify the correct stack bar chart representing the row relative frequencies of the type of delivery services from Table 1.2.Q.

Options :

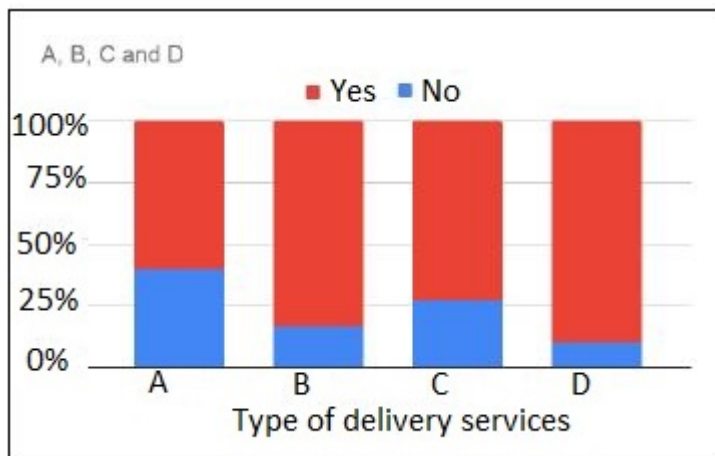
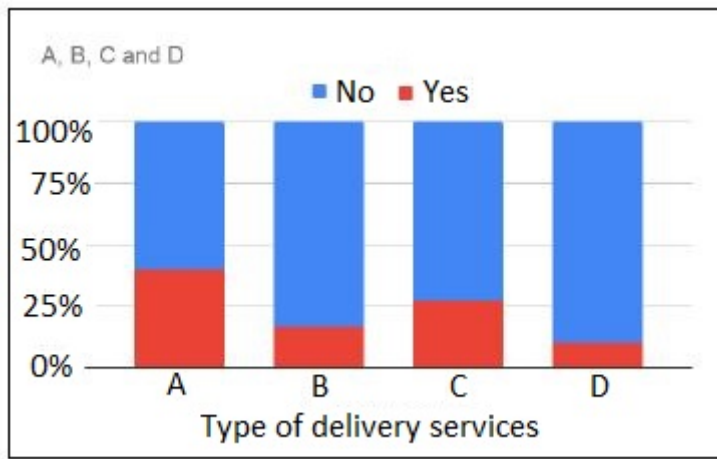


A. ✖



B. ✔

C. ✖



D. ✖

Mathematics for Data Science - 1

Number of Questions : 11

Section Marks : 50

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

$B \times A = \{(4, 5), (4, 6), (5, 5), (5, 6), (6, 5), (6, 6)\}$,
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 the previous question and a third set $C = \{x \mid x \in \mathbb{N}, x \text{ is a prime number less than } 10\}$. Consider the Universe to be $U = \{x \mid x \in \mathbb{N}, x \text{ is less than } 10\}$. Which of the following options are correct?

Options :

A. ✖ $(B \times B) \cap (C \times C)$ is an empty set

B. ✔ $A \times A$ is a proper subset of $B \times B$

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

D. ✖ $A \cap C^c$ is an empty set

Question Number : 76 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. Codomain of the function is \mathbb{R} . 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 $\{y \in \mathbb{R} \mid y \geq k\}$, when $a > 0$
- D. ✗ The range of the function is given by $\{y \in \mathbb{R} \mid y \geq k\}$, when $a < 0$
- E. ✓ f is not surjective

Question Number : 77 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, $R = \{(f, g) \in A \times A : f(5) = g(5) \text{ or } f(7) = g(7)\}$.

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 : 78 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 $b = 2a$, a signal is received by Amal. For which of the following coordinates will Amal receive a signal?

Options :

A. ✖ (1, 2)

B. ✔ (0, 0)

C. ✔ (24, 48)

D. ✖ (3, 6)

Question Number : 79 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 ₹420 per day, A makes ₹240 for every item he sells. In addition to a fixed pay of ₹600 per day, B makes ₹180 for every item she sells. Both A and B sell equal number of items and earn equal amount (in ₹) every day of a month. 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 :

90

Question Type : COMPREHENSION**Question Numbers : (80 to 81)**

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 by the algebraic sum of the equations of ℓ_1 and ℓ_2
S3	If two quadratic equations, which are given by $x^2 - 8x + 3k = 0$ and $x^2 - 12x + 7k = 0$, where k is real, have exactly one root in common, then what will be the value of k ?
S4	Slope of a parabola at its vertex is always 0
S5	$(1, 2)$ is equidistant from the lines $x + y - 2 = 0$ and $7x - y = 0$

Table 1

Answer No.	Answer (A)
A1	True
A2	$k = 5$
A3	False
A4	$k = 3$

Table 2

Sub questions**Question Number : 80 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 : 81 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 bijective
- D. ✓ The functional mapping from S to A is neither one-one nor onto
- E. ✗ None of these: The mapping from S to A is not a function

Question Number : 82 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 $\triangle MNP$. Bimal moves the toys in a way such that all 3 sides of the triangle move 1 unit inwards to form $\triangle QRS$. 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 $[(0,0)]$?

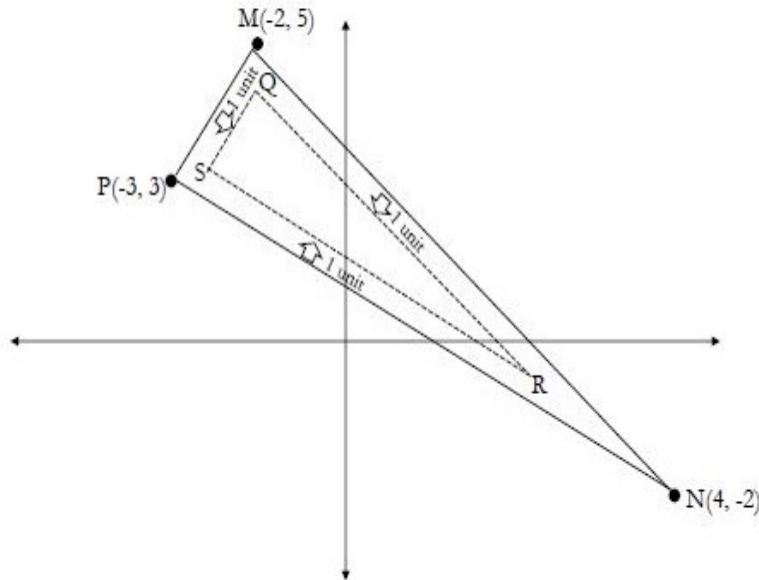


Figure 1: Here MN is parallel to QR , PN is parallel to SR and MP is parallel to QS .

Options :

A. ✗ $3y + 5x - 7 = 0$

B. ✗ $7x + 6y - 16 = 0$

C. ✓ $y - 2x - 6.76 = 0$

D. ✗ $y - 2x - 9.5 = 0$

Question Number : 83 Question Type : MSQ

Correct Marks : 4

Question Label : Multiple Select Question

Value of a quadratic function $f(x)$ decreases over the interval $(-\infty, -1)$ and increases over the interval $(-1, \infty)$. Also, $f(0) = f(-2) = 10$. 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. ✔ $f(x) = ax^2 + (2a)x + 10$, when $a > 0$

D. ✔ $f(x)$ can be $x^2 + 2x + 10$

E. ✖ $f(x)$ can be $(x + 1)^2 + 12$

Question Number : 84 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 $y = 2x^2 - 6x + m$ touches the X -axis only once.

Options :

A. ✔ 4.5

B. ✖ 1.5

C. ✖ 2.5

D. ✖ 3.5

Question Number : 85 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: $y = x + 2$

Fit2: $y = 1.5x + 8$

Fit3: $y = 0.6x + 8$

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 Fit2
- D. ✖ Fit1 is better than Fit2 and Fit3 is better than Fit1
- E. ✔ Fit3 is the best fit