Instructions
For the following questions answer them individually

Question 1
In a code language, YOGHURT is written as 251578211820. How will DEVELOP be written as in that language?

A  45225121515
B  45215121516
C  45225121516
D  45225111516

Answer: C

Explanation:
As per the given in the question,
Y  25  letter  25
O  15  letter  15
G  7  letter  7
H  8  letter  8
U  21  letter  21
R  18  letter  18
T  20  letter  20

Similarly,
D  4  letter  4
E  5  letter  5
V  22  letter  22
E  5  letter  5
L  12  letter  12
O  15  letter  15
P  16  letter  16

Hence, the required number will be 45225121516.

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Question 2
Three of the following four words are alike in a certain way and one is different. Pick the odd word out.

A  Examine
B  Deliberate
C Inquire
D Explore

Answer: B

Explanation:
As per the given option,
Apart from option B, all the words are starting from the vowels.

Question 3
Which number will replace the question mark (?) in the following series?
115, ?, 134, 145, 157, 170

A 122
B 124
C 127
D 125

Answer: B

Explanation:
As per the given terms in the question,
115, ?, 134, 145, 157, 170

We can conclude that,
\[ 115 + 9 = 124 \]
\[ 124 + 10 = 134 \]
\[ 134 + 11 = 145 \]
\[ 145 + 12 = 157 \]
\[ 157 + 13 = 170 \]
\[ 170 + 14 = 184 \]

Hence the question mark will be replaced by 124.

Question 4
'A + B' means 'A is the sister of B'.
'A - B' means 'A is the brother of B'.
'A × B' means 'A is the mother of B'.
'A ÷ B' means 'A is the father of B'.
If V + S × Q - P ÷ T + R × U, then how is R related to S?

A Daughter
B Grandson
C Maternal grandmother
D Grand-daughter

Answer: D

Explanation:
As per the given tree,
We can conclude that, S is the grand-daughter of R.
Question 5
Three different positions of the same dice are shown. Which number will be on the face opposite to the one having 2?

A 3  
B 5  
C 4  
D 6  

Answer: C

Explanation:
As per the given pattern,
We can see that 3 is the adjacent faces of 1 and 4 and 2 is also the adjacent faces of 1 and 3,
Hence the opposite face of 2 will be 4.

Question 6
How many triangles are present in the following figure?

A 19  
B 20  
C 18  
D 17
Answer: A

Explanation:
As per the given patterns in the question,

There is only one such triangle is present.

Question 7
Two statements are given, followed by three conclusions numbered I, II and III. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

Statements:
All drums are sticks.
Some drums are boxes.

Conclusions:
I. Some boxes are sticks.
II. Some sticks are drums.
III. All sticks are drums.

A. Only conclusions I and III follow.
B. All the conclusions, I, II and III follow
C. Only conclusions II and III follow
D. Only conclusions I and II follow

Answer: D

Explanation:
As per the given statement in the question,
It is following the given sets,

Hence, Option D is the correct answer.
Question 8
Which two signs should be interchanged to make the following equation correct?
\[4 \times 5 - 24 \div 12 + 8 = 14\]

A  \(\div\) and \(\times\)  
B  \(\times\) and \(+\)  
C  \(+\) and \(-\)  
D  \(+\) and \(\div\)  

Answer: C

Explanation:
From the given pattern,
\[4 \times 5 - 24 \div 12 + 8 = 14\]
If we are interchanging \(+\) and \(-\),
Then,
\[\Rightarrow 4 \times 5 + 24 \div 12 - 8 = 14\]
\[\Rightarrow 4 \times 5 + 2 - 8 = 14\]
\[\Rightarrow 20 + 2 - 8 = 14\]
\[\Rightarrow 22 - 8 = 14\]
\[\Rightarrow 14 = 14\]

Question 9
Select the option that depicts how the given transparent sheet of paper would appear if it is folded at the dotted line.

A  

B  

C  

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Answer: D

Explanation:
As per the given pattern,
After folding the transparent sheet, We will be able to see the given pattern as per the mentioned,

Hence option D will be the correct answer.

Question 10
Arrange the following words in a logical and meaningful order.
1. Writing
2. Book
3. Seller
4. Idea
5. Feedback
6. Reader

A 4, 1, 2, 6, 3, 5
B 4, 1, 2, 3, 6, 5
C 4, 1, 2, 6, 5, 3
D 4, 1, 3, 6, 5, 2

Answer: B

Explanation:
As per the given question,
1. Writing
2. Book
3. Seller
4. Idea
5. Feedback
6. Reader

We can arrange it in the systemic way,

Hence the correct order will be 4,1,2,3,6,5

Question 11
Which letter will replace the question mark (?) in the following series?
X, R, ?, I, F, D, C

A Q

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As per the given pattern in the question, $X, R, ?, I, F, D, C$.

Question 12
Select the figure in which the given figure is embedded. (Rotation is not allowed).

Answer: B

Explanation:
From the given pattern,
We can see it is present in the given option. Hence option B is the correct answer.

**Question 13**

In the given Venn diagram, the circle represents 'businessmen', the triangle represents 'landlords' and the rectangle represents 'income tax payers'. The numbers given in the diagram represent the number of persons in that particular category.

How many businessmen are tax payers but NOT landlords?

A 22  
B 8  
C 17  
D 19  

**Answer: A**

**Explanation:**

As per the given terms in the questions,
The highlighted terms is representing the number of businessmen taxpayers but no a landlords.

**Question 14**

Select the correct mirror image of the given figure when the mirror is placed to the right of the figure.
Question 15

Select the word-pair in which the two words are related in the same way as are the two words in the following word pair.

Suitcase : Cloak Room

A Salary : Credit
B Bag : Luggage
C Chair : Furniture
D Money : Bank

Answer: D

Explanation:
As per the given terms,

Suitcase : Cloak Room

Cloak Room is a place where suitcase can be put.
Similarly
Bank is place where money can be put.

Question 16
In a code language, PERMANENT is written as EPMRBENTN. How will TECHNICAL be written as in that language?

A ETHCPCILA
B ETHCOCILA
C ETCHOCILA
D TEHCOCIAL

Answer: B

Explanation:
As per the given term in the question, PERMANENT after interchanging the odd place number with the even place number and the middle number A will be written the next letter in English alphabet B, EPMRBENTN.

Similarly, TECHNICAL after interchanging the odd place number with the even place number and the middle number N will be written the next letter in English alphabet O, ETHCOCILA.

Question 17
Select the missing number from the below options.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>45</td>
<td>57</td>
<td>?</td>
</tr>
</tbody>
</table>

A 55
B 53
C 54
D 52

Answer: A

Explanation:
As per the given pattern in the question,

9 - 6 = 3 and 9 + 6 = 15 so 3 x 15 = 45
11 - 8 = 3 and 11 + 8 = 19 so 3 x 19 = 57
Question 18
Three of the following four number-pairs are alike in a certain way and one is different. Pick the number-pair that is different from the rest.

A 7 : 48  
B 13 : 170  
C 11 : 120  
D 5 : 24  

Answer: B  

Explanation:
As per the given option, we can see that,
71 is related to 48 as \(7^2 - 1 = 48\)
11 is related to 120 as \(11^2 - 1 = 120\)
5 is related to 24 as \(5^2 - 1 = 24\)
But option B is different, it is not following the pattern.
\(13^2 + 1 = 170\)

Question 19
Select the option that is related to the third number in the same way as the second number is related to the first number.

9 : 90 :: 12 : ?  
A 156  
B 152  
C 160  
D 150  

Answer: A  

Explanation:
As per the question,
9 : 90 :: 12 : ?  
Here, 9 is related with the 90 as \(9^2 + 9 = 90\)
Similarly, 12 is related with 156 as \(12^2 + 12 = 156\)

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Question 20
Select the figure that will come next in the following figure series.

\[\begin{array}{cccc}
\blacktriangle & \blacklozenge & \blacktriangle & \blacklozenge \\
\blacklozenge & \blackdiamond & \blacklozenge & \blackdiamond \\
\blacklozenge & \blacklozenge & \blacklozenge & \blacklozenge \\
\blacklozenge & \blacklozenge & \blacklozenge & \blacklozenge \\
\end{array}\]
Question 21

The sum of the current ages of Vishal and Armaan is 70 years. 5 years ago, Vishal was twice as old as Armaan. What is Armaan’s current age?

A. 10 years
B. 45 years
C. 25 years
D. 20 years

Answer: C

Explanation:
Let the current age of Armaan = x Years and age of Vishal = Y years
As per the question,
\[ x + y = 70 \]  \( (i) \)
5 Years ago, age of Vishal = Y - 5
5 Years ago, age of Arman = x - 5
As per the condition,
\[ 2(x - 5) = (y - 5) \]
\[ 2x - 10 = y - 5 \]
\[ 2x - y = 10 - 5 = 5 \]
\[ 2x - y = 5 \]

From the equation (i) and (ii)
\[ 3x = 75 \]
\[ x = 25 \text{ Years} \]
So, \( y = 45 \text{Years} \)

Hence current age of Arman = 25 Years.

Question 22

Three of the following four letter-clusters are alike in a certain way and one is different. Pick the odd one out.

A. JKNRV
B. PQTXC
C. GHKOT
D. UVYCH

Answer: A

Explanation:
From the given option,

\[ J \uparrow\downarrow K \uparrow\downarrow N \uparrow\downarrow R \uparrow\downarrow C \]

Apart from the first option, rest of all are following the same pattern.

\[ P \uparrow\downarrow Q \uparrow\downarrow T \uparrow\downarrow X \uparrow\downarrow C \]
\[ G \uparrow\downarrow H \uparrow\downarrow K \uparrow\downarrow O \uparrow\downarrow T \]
\[ U \uparrow\downarrow V \uparrow\downarrow Y \uparrow\downarrow C \uparrow\downarrow H \]

Question 23

Select the missing number from the below options.

| 11 | 17 | 8 |
| 16 | 36 | 4 |
| 15 | 23 | ? |

A. 14
B. 10
C. 12
D. 11
Answer: B

Explanation:
As per the given pattern,
We can see the middle row is a perfect square,

\[
\begin{array}{ccc}
11 & 17 & 8 \\
16 & 36 & 4 = 2\times2 \\
15 & 23 & ?
\end{array}
\]

11+4=15
17+6=23
15+4=15
Hence, 8+2=10

Question 24

‘Political Science’ is related to ‘Social Science’ in the same way as ‘Chemistry’ is related to ‘………’

A Humanities
B Elements
C Science
D Equations

Answer: C

Explanation:
As political science is the branch of the social science, similarly chemistry is the branch of science.

Question 25

Which letter-cluster will replace the question mark (?) in the following series?
FKP, HNT, JQX, LTB, ?

A NWF
B NXF
C NWG
D MWF

Answer: A

Explanation:
As per the question,

\[
\begin{array}{ccc}
P^+ & H^+ & T^+ \\
K^+ & N^+ & Q^+ \\
P^+ & T^+ & X^+
\end{array}
\]

Hence next term will be NWF.
Instructions
For the following questions answer them individually

Question 26
What is the dominant chemical present in detergent powder?

A  Calcium carbonate
B  Sodium alkyl sulphate
C  Hydrochloric acid
D  Sodium carbonate
Answer: D

Question 27
Rajat has hypermetropia. What type of lens will the ophthalmologist recommend to correct his vision?

A  Convex
B  Progressive
C  Bifocal
D  Concave
Answer: A

Question 28
What effect will a decrease in demand and an increase in supply have on equilibrium price?

A  Sometimes price will rise and sometimes it will fall
B  Equilibrium price will fall
C  Equilibrium price will rise
D  Equilibrium price will be constant
Answer: B

Question 29
Name the tissue that transports food to various parts of a plant.

A  Parenchyma
B  Sclerenchyma
C  Xylem
D  Phloem
Answer: D
Question 30
To which of the following Indian states does the tribe of 'Nyishi' belong?

A Chhattisgarh
B Tamil Nadu
C Arunachal Pradesh
D Bihar
Answer: C

Question 31
During World War II, the Battles of Kohima and Imphal were fought in the year _____.

A 1942
B 1944
C 1945
D 1943
Answer: B

Question 32
Which article of the Constitution of India provides that each Indian state will have a governor?

A Article 151
B Article 154
C Article 152
D Article 153
Answer: D

Question 33
Which Indian badminton player was runner-up at the 2019 Swiss Open tournament?

A Kidambi Srikanth
B Sai Praneeth
C Parupalli Kashyap
D Chetan Anand
Answer: B
Question 34
Which of the following is called the 'popular chamber'?

A  Gram Sabha  
B  Rajya Sabha  
C  State Assembly  
D  Lok Sabha  

Answer: D

Question 35
The term 'Dolphin Kick' is associated with which sport?

A  Football  
B  Rugby  
C  Swimming  
D  Cricket  

Answer: C

Question 36
Which Indian batsman was the first to hit six consecutive sixes in first-class cricket?

A  Ravi Shastri  
B  Virat Kohli  
C  Sachin Tendulkar  
D  Sunil Gavaskar  

Answer: A

Question 37
____ has been established as the annual 'International Day of Happiness'.

A  15th January  
B  31st March  
C  20th March  
D  23rd February  

Answer: C

Question 38
Dashain' is the grandest festival of ______.
A Nepal
B Bangladesh
C Bhutan
D Sri Lanka

**Answer:** A

**Question 39**
Which of the following is the highest mountain peak in Maharashtra?

A Taramati
B Anjaneri
C Salher
D Kalsubai Shikhar

**Answer:** D

**Question 40**
Which of the following Indian film-makers was given the title of 'Ambassador of Interlaken' in 2011 at Switzerland?

A Subhash Ghai
B Yash Johar
C Yash Chopra
D Raj Kapoor

**Answer:** C

**Question 41**
Who was the last ruler of the Vaghela Dynasty of Gujarat after whose defeat the kingdom was passed to Alauddin Khilji?

A Rama
B Arjuna Deva
C Karandev
D Saranga Deva

**Answer:** C

**Question 42**
Who is the author of the book 'India Shastra: Reflections on the Nation in our Time'?

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Question 43
Which of the following countries is the largest producer of wheat in the world?

A India  
B Bangladesh  
C Myanmar (Burma)  
D China

Answer: D

Question 44
What was India’s rank among 156 countries in the Global Happiness Index 2019?

A 132<sup>nd</sup>  
B 124<sup>th</sup>  
C 137<sup>th</sup>  
D 140<sup>th</sup>

Answer: D

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Question 45
Blue litmus paper turns ____ on contact with an acidic solution.

A green  
B red  
C yellow  
D brown

Answer: B

Question 46
____ is well-known for the golden beautification of the Harmandir Sahib Gurdwara in Amritsar, famously known as the Golden Temple.

A Charat Singh
B  Maha Singh
C  Ranjit Singh
D  Duleep Singh
   Answer: C

Question 47
What is the distinctive characteristic of 'marsupials'?
A  They hibernate in winter
B  They lay eggs
C  They carry young ones in pouches
D  They migrate from one place to another
   Answer: C

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Question 48
Which state of India has the longest mainland coastline?
A  Odisha
B  Kerala
C  Maharashtra
D  Gujarat
   Answer: D

Question 49
A substantial increase in capital expenditure or revenue deficit leads to _____.
A  Budgetary Deficit
B  Fiscal Deficit
C  Primary Deficit
D  Revenue Deficit
   Answer: B

Question 50
In the year ________, the Maratha Empire ceased to exist with the surrender of the Marathas to the British, ending the Third Anglo-Maratha War.
A  1818
B  1792
C  1811
Two articles are sold for ₹ 4,956 each. On one, the seller gains 18% and on the other he loses 16%. What is his overall gain or loss percent to nearest one decimal place?

A 1.9% loss  
B 1.9% gain  
C 2.1% gain  
D 2.1% loss  

Answer: A

Explanation:
Let the cost price of the first article is x and the cost price of the second article is y.

Given that, sold price of the article = 4956Rs, gain = 18% and loss = 16%.

\[
\frac{SP - CP}{CP} = \frac{18}{100} = 0.18 \\
\Rightarrow \quad (4956 - x) \times 100 = 18x \\
\Rightarrow \quad 18x = 4956 \times 100 - 100x \\
\Rightarrow \quad 18x + 100x = 4956 \times 100 \\
\Rightarrow \quad 118x = 4956 \times 100 \\
\Rightarrow \quad x = \frac{4956 \times 100}{118} = 4200Rs.
\]

Gain amount = 4956 - 4200 = 756Rs.

Similary,

\[
\frac{CP - SP}{CP} = \frac{16}{100} = 0.16 \\
\Rightarrow \quad (y - 4856) \times 100 = 16y \\
\Rightarrow \quad 16y = 100y - 4956 \times 100 \\
\Rightarrow \quad 100y - 16y = 4956 \times 100 \\
\Rightarrow \quad 84y = 4956 \times 100 \\
\Rightarrow \quad y = \frac{4956 \times 100}{84} = 5900Rs.
\]

Hence, net loss amount = 5900 - 4956 = 944Rs

Hence the required percentage = \(\frac{944}{4956} \times \frac{100}{1000} = \frac{10100}{12000} = 0.84%\)

\[\Rightarrow 0.84\%\]
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Question 52
The following table shows the percentage distribution of students in various disciplines from five different colleges.

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Colleges</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td></td>
<td>25</td>
<td>35</td>
<td>45</td>
<td>28</td>
<td>35</td>
</tr>
<tr>
<td>Economics</td>
<td></td>
<td>35</td>
<td>40</td>
<td>20</td>
<td>42</td>
<td>25</td>
</tr>
<tr>
<td>Mathematics</td>
<td></td>
<td>40</td>
<td>25</td>
<td>35</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Total Students</td>
<td></td>
<td>8,000</td>
<td>10,000</td>
<td>15,000</td>
<td>9,000</td>
<td>11,000</td>
</tr>
</tbody>
</table>

What is the average number of students from the science discipline of all the colleges taken together?

A 3748
B 3762
C 3642
D 3724

Answer: D

Explanation:
As per the given table,

Total number of student in the college A = \( \frac{25 \times 8000}{100} = 2000 \) 

Total number of student in the college B = \( \frac{35 \times 10000}{100} = 3500 \) 

Total number of student in the college C = \( \frac{45 \times 15000}{100} = 6750 \) 

Total number of student in the college D = \( \frac{28 \times 9000}{100} = 2520 \) 

Total number of student in the college A = \( \frac{35 \times 11000}{100} = 3850 \) 

Hence average number of students are studying in all the colleges = \( \frac{2000 + 3500 + 6750 + 2520 + 3850}{5} = 3724 \) 

Question 53
In a circle with centre O, AB is a diameter and CD is a chord such that ABCD is a trapezium. If \( \angle BAC = 28^\circ \), then \( \angle CAD \) is equal to:

A \( 32^\circ \) 
B \( 62^\circ \) 
C \( 34^\circ \) 
D \( 28^\circ \) 

Answer: C

Explanation:
As per the given question,
ABCD is a trapezium, So, AB and CD are a parallel lines.

We know that $\angle BAC = \angle ACD$ .......(alternate angle)

$\angle ACB = 90^\circ$ angled formed by diameter and chord in semi circle.

We know that ABCD is a cyclic quadrilateral, because all the vertices of the quadrilateral is on the circumference of the circle.

Hence the sum of the opposite angle = 180

Let $\angle CAD = x$

So, $\angle BAD + \angle BCD = 180^\circ$

\[28 + x + 90 + 28 = 180\]

\[x = 180 - 90 - 28 - 28 = 34^\circ\]

Hence, $x = 34^\circ$

**Question 54**

In $\triangle ABC$, P is a point on BC such that BP : PC = 2 : 3 and Q is the mid point of AP. Then ar($\triangle ABQ$) : ar($\triangle ABC$) is equal to:

A 1:5
B 1:4
C 2:3
D 2:5

**Answer:** A

**Explanation:**

As per the question,

$\triangle ABC$

P is a point on BC such that BP : PC = 2 : 3

Q is the mid point of AP,
We know that, if any triangle have the same same height, then then the ratio of there area is always equal to the ratio of the there base respectively.

In triangle ABC, \(\text{ar}(\triangle ABC) = \text{ar}(\triangle APC) + \text{ar}(\triangle APB)\)

\[\frac{\text{ar}(\triangle APC)}{\text{ar}(\triangle APB)} = \frac{\text{AP}}{\text{PB}}\]

\[\frac{\text{ar}(\triangle APC)}{\text{ar}(\triangle APB)} = \frac{2}{3} = k \text{ (supposed)}\]

\[\text{ar}(\triangle ABC) = \frac{5}{2} \text{ar}(\triangle APB) \text{--------(i)}\]

Similarly,

In \(\triangle ABP\),

\[\text{ar}(\triangle ABP) = \text{ar}(\triangle ABQ) + \text{ar}(\triangle BPQ)\]

\[\frac{\text{ar}(\triangle ABQ)}{\text{ar}(\triangle QBP)} = \frac{1}{1}\]

\[\text{ar}(\triangle ABQ) = \text{ar}(\triangle QBP) = \frac{\text{ar}(\triangle ABP)}{2} \text{--------(ii)}\]

From equation (i) and (ii)

\[\frac{\text{ar}(\triangle ABQ)}{\text{ar}(\triangle ABC)} = \frac{2}{5 \times 2} = \frac{1}{5}\]

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**Question 55**

The following table shows the percentage distribution of students in various disciplines from five different colleges.

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Colleges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Science</td>
<td>25</td>
</tr>
<tr>
<td>Economics</td>
<td>35</td>
</tr>
<tr>
<td>Mathematics</td>
<td>40</td>
</tr>
<tr>
<td>Total Students</td>
<td>8,000</td>
</tr>
</tbody>
</table>

If the data of the total students’ college wise, is represented by a pie-chart, what is the central angle of the sector representing college E (to nearest whole number)?

A \(73^\circ\)

B \(78^\circ\)

C \(79^\circ\)

D \(75^\circ\)

**Answer:** D

**Explanation:**

As per the given data in the question,

Total number of student in the college E = 11,000

Total number of student \(= 8000 + 10000 + 15000 + 9000 + 11000 = 53000\)

Hence, the ratio of student in E and total student \(= \frac{11000}{53000}\)

Hence, the angle at the center \(\frac{11 \times 360}{53} = 74.71^\circ \cong 75^\circ\)

**Question 56**

The value of: \(3.8 + (8.2 \div 4.1 \times 2) - 4 \times 3 \div 1.2\)

A 1.2

B -2.2

**Answer:** B

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2.2
D -1.2

Answer: B

Explanation:
As per the given question,
$$3.8 + (8.2 \div 4.1 \times 2) - 4 \times 3 \div 1.2$$
$$\Rightarrow 3.8 + (2 \times 2) - 4 \times 3 \div 1.2$$
$$\Rightarrow 3.8 +4 - 4 \times 3 \div 1.2$$
$$\Rightarrow 3.8 +4 - 4 \times \frac{1}{0.4}$$
$$\Rightarrow 3.8 +4 - 10$$
$$\Rightarrow 7.8 - 10$$
$$\Rightarrow -2.2$$

Question 57
The price of sugar is increased by 17%. A person wants to increase his expenditure by 7% only. By what percentage, correct to one decimal place, should he reduce his consumption?

A 8.3%
B 8.1%
C 8.7%
D 8.5%

Answer: D

Explanation:
Let the initial price of 1kg sugar was =100 Rs.
And initial consumption of the person was =100 Rs.
Price of the sugar was increased by 17%,
Hence, new price of the sugar $$=117$$Rs.
Expenditure of the person was increased by 7%,
Hence new expenditure amount of the person $$=107$$Rs.
Hence, the required percentage $$=\frac{(117-107)\times 100}{117}=8.5\%$$

Question 58
$$\triangle$$ABC $$\sim$$ $$\triangle$$RQP and PQ = 10 cm, QR = 12 cm and RP = 16 cm. If ar($$\triangle$$PQR): ar($$\triangle$$ABC) = $$\frac{9}{4}$$, then BC is equal to:

A 8 cm
B 6 cm
C $$\frac{20}{3}$$ cm
D $$\frac{32}{3}$$ cm

Answer: C

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As per the question, \(\triangle ABC \sim \triangle RQP\)

\(PQ = 10\) cm, \(QR = 12\) cm and \(RP = 16\) cm

\[\text{ar} (\triangle PQR) : \text{ar} (\triangle ABC) = \frac{9}{4}\]

Now, by the similar triangle theorem,

\[\text{ar} (\triangle RQP) : \text{ar} (\triangle ABC) = \left(\frac{RQ}{AB}\right)^2 = \left(\frac{QP}{BC}\right)^2 = \left(\frac{PR}{CA}\right)^2\]

Hence, substituting the values,

\[\text{ar} (\triangle RQP) : \text{ar} (\triangle ABC) = \left(\frac{10}{BC}\right)^2 = \frac{9}{4}\]

\[\Rightarrow \frac{100}{BC^2} = \frac{9}{4}\]

\[\Rightarrow BC = \sqrt{\frac{4}{9} \times 100} = \frac{2 \times 10}{3} = \frac{20}{3}\text{cm}\]

Question 59

If \(a + b + c = 6\) and \(ab + bc + ca = 5\), then \(a^3 + b^3 + c^3 - 3abc\) is equal to:

A 108  
B 126  
C 98  
D 116

**Answer:** B

**Explanation:**

Given that,

\(a + b + c = 6\)

\(ab + bc + ca = 5\)

Now, we know that \((a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca\)

\[(6)^2 = a^2 + b^2 + c^2 + 2 \times (5)\]

\[36 = a^2 + b^2 + c^2 + 10\]

\[a^2 + b^2 + c^2 = 26\]

Hence, \(a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)\)

Now, substituting the values,

\[(a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca) = (6)(26 - 10)\]

\[= 6 \times 16 = 96\]

\[= 126\]
Question 60
If \(a : b = 2 : 3\), then \((5a - 2b) : (5a + 2b)\) is equal to:

A 2:7
B 3:7
C 1:3
D 1:4

Answer: D

Explanation:
Given that,
\[
\frac{a}{b} = \frac{2}{3} = k
\]
So, \(a = 2k\) and \(b = 3k\)
Now substituting the values,
\[
\Rightarrow \frac{5a - 2b}{5a + 2b} = \frac{5 \times 2k - 2 \times 3k}{5 \times 2k + 2 \times 3k} = \frac{4k}{16k} = \frac{1}{4}
\]

Question 61
If \(\tan 4\theta = \cot(40^\circ - 2\theta)\), then \(\theta\) is equal to:

A \(25^\circ\)
B \(30^\circ\)
C \(20^\circ\)
D \(35^\circ\)

Answer: A

Explanation:
As per the question,
\[
\tan 4\theta = \cot(40^\circ - 2\theta)
\]
We know that \(\cot \theta = \tan(90^\circ - \theta)\)
So, \(\tan 4\theta = \tan(90^\circ - 40^\circ + 2\theta)\)
\(\Rightarrow 4\theta = 50^\circ + 2\theta\)
\(\Rightarrow 2\theta = 50^\circ\)
\(\Rightarrow \theta = 25^\circ\)

Question 62
A is 50% more efficient than B and C is 40% less efficient than B. Working together, they can complete a task in 20 days. In how many days will C alone complete 30% of that task?

A 31
B 29

Answer: B

Explanation:
Let the efficiency of B be 100 units.
Then, A's efficiency = 150 units.
And, C's efficiency = 60 units.
Together, they complete the task in 20 days.

For C to complete 30% of the task, we calculate the number of days taken by C alone.

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Question 61
Let B can finish the work in x days,

So, B can finish the work in 1 day \(= \frac{1}{x} \) days

As per the question,
If they are working together, then they can finish the work in 20 days.

So, working together, they can finish the work in \(= \frac{1}{20} \) days

A is 50% more efficient than B, so A will finish the work in \(= \frac{50x}{100} = \frac{x}{2} \) days

A can finish the work in one day \(= \frac{2}{x} \) days

C is 40% less efficient than B, so C will finish the work in \(= \frac{140x}{100} = 1.4x \) days

C can finish the work \(= \frac{1}{1.4x} \) days

If they are working together, then they can finish the work in one day \(= \frac{1}{x} + \frac{2}{x} + \frac{10}{14x} = \frac{1}{20} \) days

\[ \Rightarrow \frac{14+28+10}{14x} = \frac{1}{20} \]

\[ \Rightarrow \frac{52}{14x} = \frac{1}{20} \]

\[ \Rightarrow x = \frac{52 \times 20}{14} = \frac{520}{7} \]

Hence, C will finish the work in \(= 1.4 \times \frac{520}{7} = 104 \) days

Hence, C will be able to finish the work in \(= \frac{30 \times 104}{100} = 31.2 \) days \(\cong 31 \) days

Question 63
A train without stoppage travels with an average speed of 80 km/h and with stoppage, it travels with an average speed of 64 km/h.

For how many minutes does the train stop on an average per hour?

A 8
B 14
C 12
D 10

Answer: C

Explanation:
As per the question,
When train is not stopping at any place, then it was reaching 80 km in one hour

When it was stopping at the stopping, then it was reaching = 64 km in hour,

Hence, the time taken by the train to getting stop on the stoppage \(= \frac{80-64}{80} \times 60 \) minutes

\(= \frac{16}{80} \times 60 \) minutes = 12 minutes

Hence, C will be able to finish the work in \(= \frac{30 \times 12}{100} = 3.6 \) days \(\cong 3 \) days

SSC CGL Important Questions PDF
The following table shows the percentage distribution of students in various disciplines from five different colleges.

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Colleges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Science</td>
<td>25</td>
</tr>
<tr>
<td>Economics</td>
<td>35</td>
</tr>
<tr>
<td>Mathematics</td>
<td>40</td>
</tr>
</tbody>
</table>

Total Students 8,000 10,000 15,000 9,000 11,000

The number of students from the discipline of Economics from college B is approximately what percentage of the number of students from the discipline of Science from the college C?

A 56
B 59
C 58
D 61

Answer: B

Explanation:
As per the given table,
Total number of student from the college B from economics section $$=40\% \ of \ 10000=\frac{40\times 10000}{100}=4000$$
Total number of student from the college C from science section $$=45\% \ of \ 15000=\frac{45\times 15000}{100}=6750$$
Hence, the required percentage $$=\frac{4000\times 100}{6750}=59.2 \% \cong 59$$

Question 65
The value of: $$\frac{\sin 44^\circ}{\cos 46^\circ} + \sin^2 60^\circ - \cos^2 45^\circ + \sec 60^\circ$$ is equal to:

A $$\frac{13}{4}$$
B $$\frac{11}{3}$$
C $$\frac{11}{4}$$
D $$\frac{7}{4}$$

Answer: A

Explanation:
Given that,
$$\frac{\sin 44^\circ}{\cos 46^\circ} + \sin^2 60^\circ - \cos^2 45^\circ + \sec 60^\circ$$

$$\Rightarrow \frac{\cos (90-46)^\circ}{\cos 46^\circ} + \sin^2 60^\circ - \cos^2 45^\circ + \sec 60^\circ$$

$$\Rightarrow 1 + \sin^2 60^\circ - \cos^2 45^\circ + 2$$

$$\Rightarrow \frac{4+3-2+8}{4}=\frac{13}{4}$$

Question 66
If $$\cos \theta = \frac{4}{5}, \ then \ \sin^2 \theta \cos \theta + \cos^2 \theta \sin \theta$$ is equal to:

A $$\frac{\sin(13\cdot4)}{4}$$
B $$\frac{\sin(11\cdot3)}{4}$$
C $$\frac{\sin(11\cdot4)}{4}$$
D $$\frac{\sin(7\cdot4)}{4}$$

Answer: A

Explanation:
Given that,
$$\frac{\sin 44^\circ}{\cos 46^\circ} + \sin^2 60^\circ - \cos^2 45^\circ + \sec 60^\circ$$

$$\Rightarrow \frac{\cos (90-46)^\circ}{\cos 46^\circ} + \sin^2 60^\circ - \cos^2 45^\circ + \sec 60^\circ$$

$$\Rightarrow 1 + \sin^2 60^\circ - \cos^2 45^\circ + 2$$

$$\Rightarrow \frac{4+3-2+8}{4}=\frac{13}{4}$$

Question 66
If $$\cos \theta = \frac{4}{5}, \ then \ \sin^2 \theta \cos \theta + \cos^2 \theta \sin \theta$$ is equal to:
Given that,
\[ \cos \theta = \frac{4}{5} \]
So, \[ \sin \theta = \sqrt{1 - \cos^2 \theta} = \sqrt{1 - \left(\frac{4}{5}\right)^2} = \frac{3}{5} \]
Now, substituting the values in \[ \sin^2 \theta \cos \theta + \cos^2 \theta \sin \theta \]
\[ \Rightarrow \left(\frac{3}{5}\right)^2 \times \frac{4}{5} + \left(\frac{4}{5}\right)^2 \times \frac{3}{5} \]
\[ \Rightarrow \frac{36}{125} + \frac{48}{125} \]
\[ \Rightarrow \frac{84}{125} \]

**Question 67**

If \((a + b) = 6\) and \(ab = 8\), then \((a^3 + b^3)\) is equal to:

A 216
B 72
C 144
D 108

**Answer:** B

**Explanation:**

Given that,
\[ a + b = 6 \] and \[ ab = 8 \]
We know that,
\[ (a + b)^3 = a^3 + b^3 + 3ab(a + b) \]
\[ \Rightarrow (6)^3 = a^3 + b^3 + 3 \times 8 \times (6) \]
\[ \Rightarrow 216 = a^3 + b^3 + 144 \]
\[ \Rightarrow a^3 + b^3 = 216 - 144 = 72 \]

**Question 68**

Chords \(AB\) and \(CD\) of a circle intersect at a point \(P\) inside the circle. If \(AB = 10\) cm, \(AP = 4\) cm and \(PC = \) cm, then \(CD\) is equal to:

A 4.8 cm
B 9.8 cm
C 7.8 cm
D 6.8 cm
Question 69
The radii of the two circular faces of the frustum of a cone of height 21 cm are 5 cm and 3 cm. What is its volume in cm\(^3\) (\(\pi = \frac{22}{7}\))

A 1020
B 1058
C 1078
D 1025

Answer: C

Explanation:
As per the question,
It is given that, height (h) = 21 cm, radius (R) = 5 cm and (r) = 3 cm
\(\pi = \frac{22}{7}\)

We know that the volume of the frustum of the cone
\(V = \frac{\pi h(R^2 + r^2 + R \times r)}{3}\)

\(\Rightarrow V = \frac{22 \times 21(5^2 + 3^2 + 5 \times 3)}{3 \times 7}\)

\(\Rightarrow V = \frac{22 \times 21(25 + 9 + 15)}{21}\)

\(\Rightarrow V = 1078 \text{ cm}^3\)

General Science Notes for SSC CGL

Question 70
What is the value of x so that the seven digit number 91876x2 is divisible by 72?

A 7
B 3
C 2
D 5

Answer: B

Explanation:
As per the question,
Number 91876x2 is divisible by 72,
It means that it is individually divisible by 9 and 8 because 72 = 8 \times 9

Divisible by 8-
Any number is divisible by 8, if the last 3 digit of that particular number is divisible by 8.
So here, 6x2 will be divisible by 8 if, \(x = 3\) and 7.

Divisible by 9-
Any number is divisible by 9, if the sum of the digit of the number is divisible by 9.
So, here \(9 + 1 + 8 + 7 + 6 + x + 2 = 33 + x\)
By taking \(x = 3\), the number will be divisible by 9.
Hence, \(x = 3\) will be the correct answer.
The following table shows the percentage distribution of students in various disciplines from five different colleges.

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
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<td>40</td>
<td>20</td>
<td>42</td>
<td>25</td>
</tr>
<tr>
<td>Mathematics</td>
<td>40</td>
<td>25</td>
<td>35</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td><strong>Total Students</strong></td>
<td><strong>8,000</strong></td>
<td><strong>10,000</strong></td>
<td><strong>15,000</strong></td>
<td><strong>9,000</strong></td>
<td><strong>11,000</strong></td>
</tr>
</tbody>
</table>

What is the percentage of students from the discipline of Mathematics for colleges A and C taken together, (nearest to one decimal place)?

A 37.2
B 36.9
C 37.5
D 36.7

Answer: D

Explanation:
As per the given table, 
Total number of mathematics student in the class A \(=8000 \times \frac{40}{100}=3200\)
Total number mathematics student in the class C \(=15000 \times \frac{35}{100}=5250\)
Hence, total number of student in mathematics in the A and C \(=3200+5250 =8450\)
Total number of available student in the class A and C \(=8000+15000=23000\)
Hence, the required percentage \(=\frac{8450 \times 100}{23000}=36.7\%\)

Question 72

The difference between the compound interest and simple interest on ₹\(x\) at 12% per annum for 2 years is ₹43.20. What is the value of \(x\)?

A 3,000
B 2,500
C 2,800
D 2,400

Answer: A

Explanation:
As per the question, 
Simple Interest \(=\frac{\text{x} \times 12 \times 2}{100}=0.24\times \text{x}\)
Compound Interest \(=\text{x} \times (1+\frac{12}{100})^2-\text{x} \times (1.12^2-1)=0.2544\times \text{x}\)
Hence the difference between simple interest and compound interest \(=0.2544\times \text{x}-0.24\times \text{x}=0.0144\times \text{x}\)
\(=\frac{43.2}{0.0144}=3000\)

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Question 73
An article is sold for ₹547.40 after successive discounts of 30% and 15%. What is the market price of the article?

A ₹940
B ₹900
C ₹920
D ₹960

Answer: C

Explanation:
Let the marked price of the article =x Rs.
As per the question, there is the 30% and 15% discounts are given at the marked price,
$$\Rightarrow \left(\frac{x \times 70}{100}\right)\times \left(\frac{85}{100}\right)=547.40$$
$$\Rightarrow x=\frac{547.40\times 10\times 100}{7\times 85}$$
$$\Rightarrow x=920$$Rs.

Question 74
In a class of 60 students, 40% are girls. The average weight of the boys is 62kg and that of the girls is 55kg. What is the average weight of the whole class?

A 59.2kg
B 58.6kg
C 58.8kg
D 59kg

Answer: A

Explanation:
Let the Weight of n girls =x and weight of m boys =y
As per the question, $$n=60\times \frac{40}{100}=24$$
Given that $$m+n=60$$
$$m=60-24=36$$
Average weight of boys $$\frac{y}{36}=62$$Kg
$$\Rightarrow y=62\times 36$$
Average weight of girls $$\frac{x}{24}=55$$Kg
$$\Rightarrow x=55\times 24$$
So, average weight of whole classes $$=\frac{x+y}{m+n}=\frac{62\times 36 +55\times 24}{24+36}$$
$$\Rightarrow \frac{2232+1320}{60}=59.2$$Kg

Question 75
If $$\sqrt{x} + \frac{1}{\sqrt{x}} = 2\sqrt{2}$$, then $$x^2 + \frac{1}{x^2}$$ is equal to:

A 36
B 34
C 32
Explanation:
Given that,
$$\sqrt{x} + \frac{1}{\sqrt{x}} = 2\sqrt{2}$$
Taking the square of the both side,
$$\Rightarrow (\sqrt{x} + \frac{1}{\sqrt{x}})^2 = (2\sqrt{2})^2$$
$$\Rightarrow (\sqrt{x})^2 + (\frac{1}{\sqrt{x}})^2 + 2 = (2\sqrt{2})^2$$
$$\Rightarrow x + \frac{1}{x} + 2 = 8$$
$$\Rightarrow x + \frac{1}{x} = 6$$-------------------(i)
Again taking square of the equation (i)
$$\Rightarrow (x + \frac{1}{x})^2 = 6^2$$
$$\Rightarrow x^2 + \frac{1}{x^2} + 2 = 36$$
$$\Rightarrow x^2 + \frac{1}{x^2} = 34$$

Instructions
For the following questions answer them individually

Question 76
Given below are four jumbled sentences. Select the option that gives their correct order.
A. So, I had thoughts of setting up an Indian restaurant there with my wife's support.
B. It took us two months to redesign the place to suit our needs.
C. One of the things I really missed when I set up home in Maryland, was a restaurant that served authentic Indian food.
D. I decided to pursue this idea seriously and bought an old building in the downtown.

A. CBAD
B. CADB
C. DACB
D. BCDA

Answer: B

Question 77
Select the word which means the same as the group of words given.
A state of perfect balance

A. equilibrium
B. equinox
C. equilateral

A. equilibrium
B. equinox
C. equilateral
Question 78
In the sentence identify the segment which contains the grammatical error.
Not complying by any of the laws can land you into serious trouble.

A can land you
B into serious trouble
C any of the laws
D Not complying by

Answer: D

Question 79
Given below are four jumbled sentences. Select the option that gives their correct order.
A. Lyrics help in creating a distinctive narrative, some conventions of which have been carried over from the talkies era.
B. Thus, songs have outlived films in people's memories.
C. However, songs seem to have acquired a musical grammar of their own, establishing an emotional chord with the listeners.
D. In popular Indian cinema, lyrics are to music what the heart is to the body.

A ADBC
B ABCD
C DCBA
D DACB

Answer: D

Question 80
Select the most appropriate synonym of the given word.
DEVOUT

A revered
B pious
C respectable
D loyal

Answer: B

Question 81
Select the correctly spelt word.

A exilerate
B exilarate

Answer: B
Question 82
Select the most appropriate option to fill in the blank.
I sat ______ my life as nothing seemed to be working for me.

A invoking
B cursing
C tormenting
D blessing

Answer: B

Question 83
In the sentence identify the segment which contains the grammatical error.
Raja Ravi Varma was one of the first artist who tried to create a style that was both modern and traditional.

A to create a style that was
B Raja Ravi Varma was
C one of the first artist
D both modern and traditional

Answer: C

Question 84
Select the most appropriate synonym of the given word.
RENOWN

A wisdom
B conceit
C fame
D obscurity

Answer: C

Question 85
Select the most appropriate antonym of the given word.
FOREIGN

A rustic
B rural
Question 86
Select the word which means the same as the group of words given.
One who walks in sleep
A pedestrian
B philanthropist
C somnambulist
D omnipotent
Answer: C

Instructions
In the following passage some words have been deleted. Fill in the blanks with the help of the alternatives given. Select the most appropriate option for each blank.

Comprehension:
English is not a language that (1)______ in India. But it is used extensively in (2)_____country. India comes second on the list of countries (3)_____most English speakers albeit not as the first language. English is more (4)_____than any single Indian language! It has managed to (5)_____the entire world.

Question 87
Select the most appropriate option to fill in blank No.(1)
A originated
B developed
C created
D derived
Answer: A

Question 88
Select the most appropriate option to fill in blank No.(2)
A one
B an
C a
D the
Answer: D
Question 89
Select the most appropriate option to fill in blank No.(3)

A by
B with
C from
D among
Answer: B

Question 90
Select the most appropriate option to fill in blank No.(4)

A prevalent
B frequented
C extended
D comprehensive
Answer: A

Question 91
Select the most appropriate option to fill in blank No.(5)

A saturate
B invade
C pervade
D persuade
Answer: C

Instructions
For the following questions answer them individually

Question 92
Select the most appropriate meaning of the underlined idiom in the given sentence.
Many people join politics to feather their own nest.

A make others' life comfortable
B serve their country
C utilize black money
D promote their own interest
Answer: D
Question 93
Select the correct passive form of the given sentence.
Credit cards are replacing cash transactions.

A  Cash transactions are being replaced by credit cards.
B  Cash transactions had been replaced by credit cards.
C  Cash transactions are replaced by credit cards.
D  Cash transactions have been replaced by credit cards.

Answer: A

Question 94
Select the correctly spelt word.

A  preportion
B  propotion
C  proportion
D  proporsion

Answer: C

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Question 95
Select the most appropriate meaning of the underlined idiom in the given sentence.
The man heaved a sigh of relief when he was sure he was out of the woods.

A  out of danger
B  released from prison
C  out of the forest
D  discharged from hospital

Answer: A

Question 96
Select the most appropriate option to fill in the blank.
The roads at 15000 feet are not easily navigable and the air is _____ and freezing.

A  exalted
B  rarefied
C  intensified
D  elevated

Answer: B
Question 97
Select the most appropriate antonym of the given word.
ASCENT

A  distant
B  depression
C  descent
D  decent

Answer: C

Question 98
Select the most appropriate option to substitute the underlined segment in the given sentence. If no substitution is required, select No improvement.
I have not saw him since I last leave the town.

A  see him since I last left
B  seen him for I last left
C  seen him since I last left
D  No improvement

Answer: C

Question 99
Select the correct active form of the given sentence.
We were given very little time to prepare the presentation.

A  They give us very little time to prepare the presentation
B  They will give us very little time to prepare the presentation.
C  They have given us very little time to prepare the presentation.
D  They gave us very little time to prepare the presentation.

Answer: D

Question 100
Select the most appropriate option to substitute the underlined segment in the given sentence. If no substitution is required, select No improvement.
Ishwarchand Vidyasagar use the ancient text to suggestion that widows could remarry.

A  used the ancient texts suggests
B  used the ancient texts to suggest
C  use the ancient texts for suggestion
D  No improvement

Answer: B
Answer: B

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