



2017 SSC CGL 09 Aug Shift-1

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Reasoning

Instructions

For the following questions answer them individually

Question 1

In the following question, select the related word from the given alternatives.

Kilometre : Metre :: Tonne : ?

- A Litre
- B Kilogram
- C Hours
- D Weight

Answer: B

Explanation:

1 kilometre = 1000 metre

Similarly, 1 tonne = 1000 kilogram

=> Ans - (B)

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Question 2

In the following question, select the related letters from the given alternatives.

AGN : IOV :: BLM : ?

- A JTU
- B KTU
- C JUV
- D TUJ

Answer: A

Explanation:

Expression : AGN : IOV :: BLM : ?

The pattern followed above is :

| | | |
|------|------|------|
| A | G | N |
| (+8) | (+8) | (+8) |
| I | O | V |

Similarly, for BLM

| | | |
|------|------|------|
| B | L | M |
| (+8) | (+8) | (+8) |
| J | T | U |

=> Ans - (A)

Question 3

In the following question, select the related number from the given alternatives.

9143 : 9963 :: 6731 : ?

- A 1368
- B 5666
- C 8964
- D 9694

Answer: C

Explanation:

Expression : 9143 : 9963 :: 6731 : ?

By adding the digits,

$$\Rightarrow 9143 = 9 + 1 + 4 + 3 = 17$$

$$\text{and } 9963 = 9 + 9 + 6 + 3 = 27$$

$$\text{Similarly, } 6731 = 6 + 7 + 3 + 1 = 17$$

$$(A) : 1368 = 1 + 3 + 6 + 8 = 18$$

$$(B) : 5666 = 5 + 6 + 6 + 6 = 23$$

$$(C) : 8964 = 8 + 9 + 6 + 4 = 27$$

$$(D) : 9694 = 9 + 6 + 9 + 4 = 28$$

\Rightarrow Ans - (C)

Question 4

In the following question, select the odd word from the given alternatives.

- A Chennai
- B Daman
- C Raipur
- D Shimla

Answer: B

Explanation:

Chennai, Raipur and Shimla are cities while Daman is a union territory.

\Rightarrow Ans - (B)

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Question 5

In the following question, select the odd letter from the given alternatives.

- A B
- B N
- C P

D W

Answer: D

Explanation:

By taking mathematical representation of the alphabets,

B -> 2

N -> 14

P -> 16

W -> 23

All except 'W' represents even numbers, hence it is the odd one out.

=> Ans - (D)

Question 6

In the following question, select the odd number from the given alternatives.

A 313

B 426

C 925

D 1034

Answer: A

Explanation:

Among the given numbers, only 313 is prime, rest are composite numbers.

=> Ans - (A)

Question 7

Arrange the given words in the sequence in which they occur in the dictionary.

1. Ball
2. Balanced
3. Balls
4. Balance
5. Balancing

A 24135

B 42135

C 42513

D 54213

Answer: C

Explanation:

As per the dictionary,

= Balance -> Balanced -> Balancing -> Ball -> Balls

≡ 42513

=> Ans - (C)

Question 8

A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.

AG, LR, WC, HN, ?

- A QY
- B RX
- C SY
- D TZ

Answer: C

Explanation:

Expression : AG, LR, WC, HN, ?

Difference between the first letter of each word is : A (+11 letters) = L

and L (+11 letters) = W and W (+11 letters) = H

So, first letter of next word is : H (+11 letters) = S

Similarly, for the second letter of the word, difference is same, => N (+11 letters) = Y

=> Ans - (C) : SY

Question 9

In the following question, select the missing number from the given series.

13, 16, 11, 18, 9, 20, ?

- A 3
- B 5
- C 6
- D 7

Answer: D

Explanation:

Expression : 13, 16, 11, 18, 9, 20, ?

It is a combination of 2 series at alternate positions, one is a decreasing odd series and other is the increasing even number series.

Thus, missing number is part of odd series : 13, 11, 9, 7

=> Ans - (D)

Question 10

Punit said to a lady, "The sister of your father's wife is my aunt". How is the lady related to Punit?

- A Daughter
- B Grand Daughter
- C Niece
- D Cousin sister

Answer: D

Explanation:

Father's wife is mother, now the sister of that lady's mother is her aunt.

Also, that woman is Punit's aunt.

Thus, that lady is the cousin sister of Punit.

=> Ans - (D)

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Question 11

There are 45 trees in a row. The lemon tree is 20th from right end. What is the rank of lemon tree from left end?

- A 26
- B 24
- C 25
- D 27

Answer: A

Explanation:

Total number of trees = 45

Position of lemon tree from right end = 20th

=> Rank of lemon tree from left end = $(45 + 1) - 20$

= $46 - 20 = 26$

=> Ans - (A)

Question 12

In the following question, from the given alternative words, select the word which cannot be formed using the letters of the given word.

UNIFORMITY

- A ANNUITY
- B FORUM
- C MINT
- D UNIFORM

Answer: A

Explanation:

The word UNIFORMITY does not contain an 'A' and thus the word 'Annuity' cannot be formed.

=> Ans - (A)

Question 13

In a certain code language, "TIRED" is written as "56" and "BRAIN" is written as "44". How is "LAZY" written in that code language?

- A 64
- B 61
- C 58

D 43

Answer: A

Explanation:

The numerical position of the alphabets is added.

$$\text{TIRED} = 20 + 9 + 18 + 5 + 4 = 56$$

$$\text{BRAIN} = 2 + 18 + 1 + 9 + 14 = 44$$

$$\text{LAZY} = 12 + 1 + 26 + 25 = 64$$

=> Ans - (A)

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Question 14

In the following question, by using which mathematical operator will the expression become correct?

$$18 ? 6 ? 9 ? 27$$

A \times, \div and $=$

B \div, \times and $=$

C $\times, +$ and $=$

D $+, -$ and $=$

Answer: B

Explanation:

Expression : $18 ? 6 ? 9 ? 27$

(A) : \times, \div and $=$

$$\Rightarrow 18 \times 6 \div 9 = 27$$

$$\text{L.H.S.} = 2 \times 6 = 12 \neq \text{R.H.S.}$$

(B) : \div, \times and $=$

$$\Rightarrow 18 \div 6 \times 9 = 27$$

$$\text{L.H.S.} = 3 \times 9 = 27 = \text{R.H.S.}$$

(C) : $\times, +$ and $=$

$$\Rightarrow 18 \times 6 + 9 = 27$$

$$\text{L.H.S.} = 108 + 9 = 117 \neq \text{R.H.S.}$$

(D) : $+, -$ and $=$

$$\Rightarrow 18 + 6 - 9 = 27$$

$$\text{L.H.S.} = 24 - 9 = 15 \neq \text{R.H.S.}$$

=> Ans - (B)

Question 15

If 18 (9) 3 and 36 (30) 5, then what is the value of A in 19 (A) 18?

A 33

B 57

C 75

D 96

Answer: B

Explanation:

The pattern is that the number in the middle is obtained by multiplying the numbers on each sides and then dividing the result by '6'.

Eg : $\frac{18 \times 3}{6} = 3 \times 3 = 9$

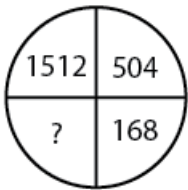
and $\frac{36 \times 5}{6} = 6 \times 5 = 30$

Similarly, $\frac{18 \times 19}{6} = 3 \times 19 = 57$

=> Ans - (B)

Question 16

In the following question. select the number which can be placed at the sign of question mark (?) from the given alternatives.



A 53

B 56

C 59

D 66

Answer: B

Explanation:

Each number is obtained by dividing the preceding the number by 3

$1512 \times \frac{1}{3} = 504$

$504 \times \frac{1}{3} = 168$

$168 \times \frac{1}{3} = 56$

=> Ans - (B)

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Question 17

How many triangles are there in the given figure.



A 14

B 15

C 17

D 18

Answer: C

Question 18

In the following question below are given some statements followed by some conclusions. Taking the given statements to be true even if they seem to be at variance from commonly known facts, read all the conclusions and then decide which of the given conclusion logically follows the given statements.

Statements:

- I. Some pencils are pens.
- II. All pens are erasers.

Conclusions:

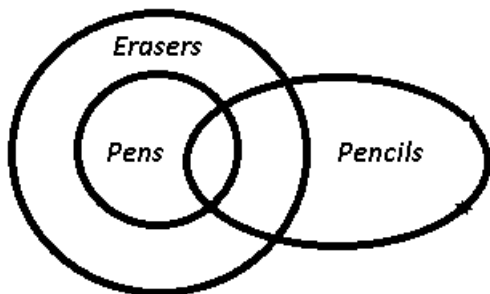
- I. Some pens are not pencils.
- II. Some erasers are not pencils.

- A Only conclusion (I) follows.
- B Only conclusion (II) follows.
- C Neither conclusion (I) nor conclusion (II) follows.
- D Both conclusions follow.

Answer: C

Explanation:

The venn diagram for the statements some pencils are pens and all pens are erasers is :



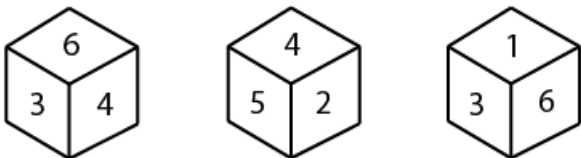
Some pens are not Pencils can be possible but cannot be concluded always. Similarly, Some Erasers are not Pencils cannot be concluded.

Thus, neither conclusion (I) nor conclusion (II) follows.

=> Ans - (C)

Question 19

Three positions of a cube are shown below. What will come opposite to face containing '4'?



A 1

B 2

C 4

D 5

Answer: A

Explanation:

From the first 2 figures, it is evident that 3, 6, 2 and 5 will not face '4' as they all are adjacent to it.

From the third figure, there is only one remaining number which will face '4' that is = '1'

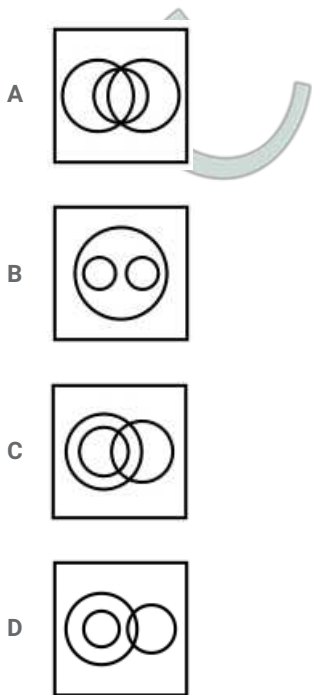
=> Ans - (A)

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Question 20

Identify the diagram that best represents the relationship among the given classes.

Music Instrument, Piano, Guitar



Answer: B

Explanation:

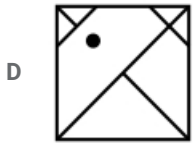
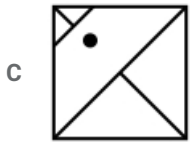
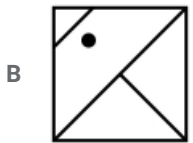
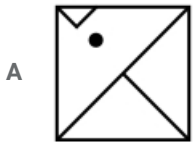
Piano and Guitar are both different types of music instruments, thus the second figure best describe their relation.



=> Ans - (B)

Question 21

Which answer figure will complete the pattern in the question figure ?



Answer: C

Explanation:

If we complete the remaining portion in the question figure, we get :

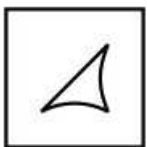


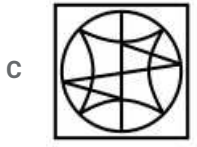
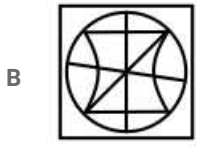
Now, the third figure resembles the part in blue colour.

=> Ans - (C)

Question 22

From the given answer figures, select the one in which the question figure is hidden/embedded.





Answer: A

Explanation:

The question figure is embedded in the following figure in the blue colour.

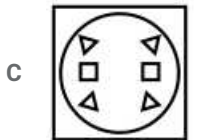
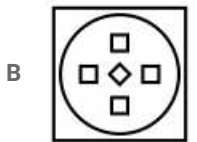


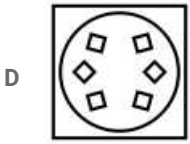
=> Ans - (A)

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Question 23

A piece of paper is folded and punched as shown below in the question figures, indicate how it will appear when opened?

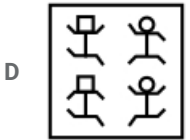
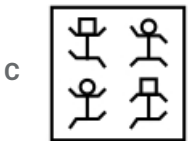
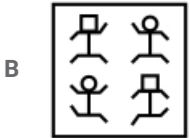
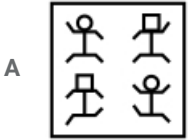
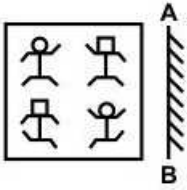




Answer: D

Question 24

If a mirror is placed on the line AB, then which of the answer figure is the right image of the given figure?



Answer: B

Explanation:

A vertical mirror is placed, so the figures at the left will appear at right and vice-versa.

Thus, in the final output, at the top left position there will be square face above circular face, thus the first and the last options will be eliminated.

Also, the position of hands will also be reversed, so third option is also eliminated.

=> Ans - (B)

Question 25

A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as shown in the given two matrices. The columns and rows of Matrix-I are numbered from 0 to 4 and that of Matrix-II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, for example, 'K' can be represented by 10, 31, etc., and 'M' can be represented by 76, 87, etc. Similarly, you have to identify the set for the word "SCAM".

Matrix - I

| | | | | | |
|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 |
| 0 | S | P | K | N | C |
| 1 | K | S | C | P | N |
| 2 | P | C | N | S | K |
| 3 | N | K | S | C | P |
| 4 | C | N | P | K | S |

Matrix - II

| | | | | | |
|---|---|---|---|---|---|
| | 5 | 6 | 7 | 8 | 9 |
| 5 | I | R | A | J | M |
| 6 | A | J | I | M | R |
| 7 | J | M | R | A | I |
| 8 | R | A | M | I | J |
| 9 | M | I | J | R | A |

- A 00, 13, 57, 76
- B 11, 04, 86, 59
- C 23, 22, 99, 95
- D 32, 40, 66, 68

Answer: B

Explanation:

- (A) : 00, 13, 57, 76 = SPAM
 - (B) : 11, 04, 86, 59 = **SCAM**
 - (C) : 23, 22, 99, 95 = SNAM
 - (D) : 32, 40, 66, 68 = SCJM
- => Ans - (B)

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General Awareness

Instructions

For the following questions answer them individually

Question 26

Who gave the 'General Equilibrium Theory'?

- A J. M. Keynes
- B Leon Walras
- C David Ricardo
- D Adam Smith

Answer: B

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Question 27

Which of the following is not true about a Demand Draft?

- A It is a negotiable instrument.
- B It is a banker's cheque.
- C It may be dishonoured for lack of funds.
- D It is issued by a bank.

Answer: C

Question 28

Who administers the oath of the President of India?

- A Governor General of India
- B Chief Justice of India
- C Prime Minister of India
- D Vice President of India

Answer: B

Question 29

Who among the following gave monistic theory of sovereignty?

- A Austin
- B Darwin
- C Aristotle
- D Marx

Answer: A

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Question 30

Which one is the correct chronological order of the following events?

- I. Quit India Movement
- II. Shimla Conference
- III. Poona Pact
- IV. Cabinet Mission

- A II, IV, I, III
- B III, IV, II, I
- C III, I, II, IV
- D IV, II, III, I

Answer: C

Question 31

In 1917, which movement was launched by Mahatma Gandhi from Champaran?

- A Satyagraha
- B Non co-operation movement
- C Quit India movement
- D Swadeshi Movement

Answer: A

Question 32

What is the name of the tropical cyclones in the China Sea?

- A Hurricanes
- B Tornado
- C Twister
- D Typhoon

Answer: D

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Question 33

Which among the following country is not a part of Scandinavia?

- A Norway
- B Finland
- C Sweden
- D Denmark

Answer: B

Question 34

Cattle quickly swallow grass and store it in their _____.

- A rumen
- B esophagus
- C small intestine
- D salivary glands

Answer: A

Question 35

Which of the following carries oxygen to various parts of human body?

- A Red blood cells
- B White blood cells
- C Plasma
- D Nerves

Answer: A

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Question 36

Which of the following function is performed by the kidneys in the human body?

- A Excretion
- B Respiration
- C Digestion
- D Transportation

Answer: A

Question 37

The bending of light when it passes around a corner or a slit is due to _____.

- A reflection
- B refraction
- C diffraction
- D total internal reflection

Answer: C

Question 38

What is the reason for formation of Mirage in desert?

- A Refraction of light
- B Reflection of light
- C Total internal reflection of light
- D Both Refraction and Total internal reflection of light

Answer: D

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Question 39

FORTRAN is not used for _____.

- (I) Drawing pictures
- (II) Carrying out mathematics computations

- A Only (I)
- B Only (II)
- C Both (I) and (II)
- D Neither (I) nor (II)

Answer: C

Question 40

Which bond is weakest in nature?

- A Single bond
- B Double bond
- C Triple bond
- D Hydrogen bond

Answer: D

Question 41

In the following reaction, fill in the blank.

Acid + Base → _____ + Water

- A Carbon dioxide
- B Metal Oxide
- C Hydrogen Gas
- D Salt

Answer: D

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Question 42

Bishnoi movement was started against which of the following?

- A Cutting of Trees
- B Inequality of Women
- C Killing of Animals
- D Increasing Pollution

Answer: A

Question 43

What is the major aim of Pradhan Mantri Ujjwala Yojana?

- A To provide electricity
- B To provide LED bulbs
- C To provide LPG connections
- D To construct village roads

Answer: C

Question 44

Who discovered television?

- A Michael Faraday
- B Joseph Henry
- C Abbe Caselli
- D John Baird

Answer: D

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Question 45

How many players are there in a team of Volleyball?

- A 2
- B 4
- C 6
- D 5

Answer: C

Question 46

Match the following.

Temple

1. Lingaraja Temple, Orissa
2. Tijara Mandir, Rajasthan
3. Venkateswara Temple, Tirupati

Lord

- a. Lord Mahavira
- b. Lord Vishnu
- c. Lord Shiva

- A 1-b, 2-c, 3-a
- B 1-c, 2-a, 3-b

C 1-a, 2-c, 3-b

D 1-b, 2-a, 3-c

Answer: B

Question 47

Who among the following has been recently awarded with 'Indian of the year' award?

A Sunita Rani

B Dhiraj Singh

C Preety Shenoy

D Abhishek Kumar

Answer: C

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Question 48

Who is the author of the book titled 'Selection Day'?

A Aravind Adiga

B Anil Menon

C Krishna Sobti

D Arunava Sinha

Answer: A

Question 49

Which of the following country is not a member of BRICS association?

A Brazil

B Russia

C Iceland

D China

Answer: C

Question 50

With which of its neighbouring country India has Kalapani territorial dispute?

A Nepal

B Bangladesh

C Pakistan

D Sri Lanka

Answer: A

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English

Instructions

For the following questions answer them individually

Question 51

In the following question, some part of the sentence may have errors. Find out which part of the sentence has an error and select the appropriate option. If a sentence is free from error, select 'No error'.

If you had (a)/ told me earlier (b)/ I will help you. (c)/ No Error (d)

- A If you had
- B told me earlier
- C I will help you
- D No Error

Answer: C

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Question 52

In the following question, some part of the sentence may have errors. Find out which part of the sentence has an error and select the appropriate option. If a sentence is free from error, select 'No error'.

Her mother is (a)/ angry and (b)/ indifferent to me. (c)/ No Error (d)

- A Her mother is
- B angry and
- C indifferent to me
- D No Error

Answer: B

Question 53

In the following question, the sentence given with blank to be filled in with an appropriate word. Select the correct alternative out of the four and indicate it by selecting the appropriate option.

Don't loiter _____ the corridor.

- A around
- B off
- C of
- D at

Answer: A

Question 54

In the following question, the sentence given with blank to be filled in with an appropriate word. Select the correct alternative out of the four and indicate it by selecting the appropriate option.

I will scold him when _____.

- A he will come
- B he comes
- C he would come
- D he had come.

Answer: B

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Question 55

In the following question, out of the four alternatives, select the word similar in meaning to the word given.

Mellifluous

- A Shiver
- B Frank
- C Immoral
- D Dulcet

Answer: D

Question 56

In the following question, out of the four alternatives, select the word similar in meaning to the word given.

Dodge

- A Soften
- B Order
- C Avoid
- D Chaotic

Answer: C

Question 57

In the following question, out of the four alternatives, select the word opposite in meaning to the word given.

Meretricious

- A Brazen
- B Natural
- C Exemplary

D Gaudy

Answer: B

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Question 58

In the following question, out of the four alternatives, select the word opposite in meaning to the word given.

Nebulous

A Definite

B Inchoate

C Dismal

D Sullen

Answer: A

Question 59

In the following question, out of the four alternatives, select the alternative which best expresses the meaning of the idiom/Phrase.

Spick and Span

A High and low

B Dark and light

C Neat and clean

D Happy and sad

Answer: C

Question 60

In the following question, out of the four alternatives, select the alternative which best expresses the meaning of the idiom/Phrase.

To draw the longbow

A To nullify

B To exaggerate

C To underrate

D To demarcate

Answer: B

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Question 61

Improve the bracketed part of the sentence.

By rescuing the child from fire, the local resident (added another feather to his cap.)

A made a significant achievement

- B was gifted with precious thing
- C was crowned and rewarded
- D No improvement

Answer: A

Question 62

Improve the bracketed part of the sentence.

The government plans to (take up) the construction project soon.

- A Take on
- B Take off
- C Take in
- D No improvement

Answer: D

Question 63

In the following question, out of the four alternatives, select the alternative which is the best substitute of the phrase.

A man devoid of kind feeling and sympathy.

- A Callous
- B Credulous
- C Gullible
- D Bohemian

Answer: A

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Question 64

In the following question, out of the four alternatives, select the alternative which is the best substitute of the phrase.

One who eats too much

- A Impostor
- B Glutton
- C Hypochondriac
- D Intestate

Answer: B

Question 65

In the following question, four words are given out of which one word is incorrectly spelt. Find the incorrectly spelt word.

- A Forfeit

- B Gorilla
- C Blissfull
- D Corrupt

Answer: C

Question 66

In the following question, four words are given out of which one word is incorrectly spelt. Find the incorrectly spelt word.

- A Afforestation
- B Translucent
- C Foreigner
- D Achievement

Answer: B

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Question 67

The question below consists of a set of labelled sentences. Out of the four options given, select the most logical order of the sentences to form a coherent paragraph.

P- The aim must be to ensure that our country does not experience either paucity or a-surfeit of trained manpower in any specific segment of our economy.

Q- When we set about the task of higher education, we should be absolutely clear in our perception of the goals of education in the specific context of our nation's development.

R- No doubt, one of the important aims of education would be to create the required range and nature of trained manpower assessed to be needed by different sectors of national growth.

S- The entire educational apparatus must be geared progressively to fulfill the requirements of different phases of our growth in every sector primary, secondary and tertiary.

- A SQPR
- B QRSP
- C SRQP
- D PSQR

Answer: B

Question 68

The question below consists of a set of labelled sentences. Out of the four options given, select the most logical order of the sentences to form a coherent paragraph.

P- Bureaucratic cultures can smother those who want to respond to shifting conditions.

Q- Arrogant managers can overevaluate their current performance and competitive position listen poorly and learn slowly.

R- And the lack of leadership leaves no force inside these organizations to break out of the morass.

S- Inwardly focused employees can have difficulty seeing the very forces that present threats and opportunities.

- A PRQS
- B SPQR

C RQPS

D QSPR

Answer: D

Question 69

In the following question, a sentence has been given in Active/Passive voice. Out of four alternatives suggested, select the one which best expresses the same sentence in Passive/Active voice.

She teaches us English.

A English is being taught to us by her.

B We are taught English by her.

C English have been taught to us by her.

D We had been taught English by her.

Answer: B

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Question 70

In the following question, a sentence has been given in Direct/Indirect speech. Out of the four alternatives suggested, select the one which best expresses the same sentence in Indirect/Direct speech.

Nisha said to Swati, " Will you help me in my project just now?"

A Nisha told Swati whether she will help her in her project just now.

B Nisha asked Swati if she would help her in her project just then.

C Nisha questioned to Swati that will you help me in my project just now.

D Nisha asked to Swati that will she help her in her work just now.

Answer: B

Instructions

In the following passage some of the words have been left out. Read the passage carefully and select the correct answer for the given blank out of the four alternatives.

Democracy should __(1)__ dignity of the individual. It should also aim at the __(2)__ good of the greatest __(3)___. The opposition party should __(4)__ the wrong plans, policies and decisions of the government in power. The government should cater to the __(5)__ needs of the people to make its position solid.

Question 71

(1)

A built

B ensure

C keep

D support

Answer: B

Question 72

(2)

- A greatest
- B smallest
- C largest
- D heaviest

Answer: A

Question 73

(3)

- A people
- B digit
- C number
- D individual

Answer: C

Question 74

(4)

- A rely on
- B against
- C support
- D oppose

Answer: D

Question 75

(5)

- A genuine
- B mere
- C emotional
- D luxurious

Answer: A

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Mathematics

Instructions

For the following questions answer them individually

Question 76

Which value among $\sqrt[3]{5}$, $\sqrt[4]{6}$, $\sqrt[6]{12}$, $\sqrt[12]{276}$ is the largest?

- A $\sqrt[3]{5}$
- B $\sqrt[4]{6}$
- C $\sqrt[6]{12}$
- D $\sqrt[12]{276}$

Answer: A

Explanation:

Values : $\sqrt[3]{5}$, $\sqrt[4]{6}$, $\sqrt[6]{12}$, $\sqrt[12]{276}$

Taking L.C.M. of exponents, \Rightarrow L.C.M.(3,4,6,12) = 12

Now, multiplying all the exponents by 12, we get :

Values : $(5)^4$, $(6)^3$, $(12)^2$, $(276)^1$
 $= 625, 216, 144, 276$

Thus, $625 \equiv \sqrt[3]{5}$ is the largest.

\Rightarrow Ans - (A)

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Question 77

A piece of work was finished by A, B and C together. A and B together finished 60% of the work and B and C together finished 70% of the work. Who among the three is most efficient?

- A A
- B B
- C C
- D A or B

Answer: C

Explanation:

Let total work to be done = 100 units

Let efficiency of A, B and C be a, b, c units/hr respectively.

$$\Rightarrow a + b + c = 100 \text{ -----(i)}$$

A and B finish 60% of the work.

$$\Rightarrow a + b = \frac{60}{100} \times 100 = 60 \text{ -----(ii)}$$

$$\text{Similarly, } b + c = 70 \text{ -----(iii)}$$

Substituting value from equation (ii) in (i),

$$\Rightarrow c = 100 - 60 = 40$$

Similarly, $a = 30$ and $b = 30$

Thus, C is the most efficient.

=> Ans - (C)

Question 78

Three solid spheres of radius 3 cm, 4 cm and 5 cm are melted and recasted into a solid sphere. What will be the percentage decrease in the surface area?

- A 12
- B 14
- C 16
- D 28

Answer: D

Explanation:

Let radius of new sphere = R cm

Thus, volume of new sphere = Sum of volumes of all the three spheres

$$\Rightarrow \frac{4}{3}\pi(R)^3 = \frac{4}{3}\pi(r_1)^3 + \frac{4}{3}\pi(r_2)^3 + \frac{4}{3}\pi(r_3)^3$$

$$\Rightarrow (R)^3 = (3)^3 + (4)^3 + (5)^3$$

$$\Rightarrow (R)^3 = 27 + 64 + 125 = 216$$

$$\Rightarrow R = \sqrt[3]{216} = 6 \text{ cm}$$

Total surface area of new sphere = $4\pi R^2$

$$= 4\pi(6)^2 = 144\pi \text{ cm}^2$$

Total surface area of the three spheres = $4\pi(r_1)^2 + 4\pi(r_2)^2 + 4\pi(r_3)^2$

$$= 4\pi(9 + 16 + 25) = 200\pi \text{ cm}^2$$

$$\therefore \text{Percentage decrease in surface area} = \frac{200\pi - 144\pi}{200\pi} \times 100$$

$$= \frac{56}{200} = 28\%$$

=> Ans - (D)

Question 79

The marked price of a sofa set is Rs 4800 which is sold at Rs 3672 at two successive discounts. If the first discount is 10%, then what will be the second discount (in %)?

- A 13
- B 14
- C 15
- D 17

Answer: C

Explanation:

Marked price = Rs. 4800

$$\text{After first discount of 10\%, } \Rightarrow \text{Price} = 4800 - \left(\frac{10}{100} \times 4800\right) = \text{Rs. } 4320$$

Selling price = Rs. 3672

$$\Rightarrow \text{Second discount} = \frac{(4320 - 3672)}{4320} \times 100$$

$$= \frac{3}{20} \times 100 = 15\%$$

\Rightarrow Ans - (C)

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Question 80

A, B and C invested amounts in the ratio 3 : 4 : 5 respectively. If the schemes offered compound interest at the rate of 20% per annum, 15% per annum and 10% per annum respectively, then what will be the ratio of their amounts after 1 year?

- A 3 : 15 : 25
- B 6 : 6 : 5
- C 36 : 46 : 55
- D 12 : 23 : 11

Answer: C

Explanation:

Let amount invested by A, B and C be Rs. 300, 400 and 500 respectively for 1 year.

$$\text{Amount under compound interest} = P\left(1 + \frac{R}{100}\right)^T$$

$$\Rightarrow \text{Amount A will get} = 300\left(1 + \frac{20}{100}\right)^1$$

$$= 300 \times \frac{120}{100} = \text{Rs. } 360$$

$$\text{Similarly, amount B will get} = 4 \times 115 = \text{Rs. } 460$$

$$\text{and C} = 5 \times 110 = \text{Rs. } 550$$

$$\therefore \text{Ratio of amounts received by A : B : C} = 360 : 460 : 550$$

$$= 36 : 46 : 55$$

\Rightarrow Ans - (C)

Question 81

The average age of 120 members of a society is 60.7 years. By addition of 30 new members, the average age becomes 56.3 years. What is the average age (in years) of newly joined members?

- A 36.5
- B 37.2
- C 38.3
- D 38.7

Answer: D

Explanation:

Average age of 120 members of the society = 60.7 years

$$\Rightarrow \text{Total age of 120 members} = 120 \times 60.7 = 7284 \text{ years}$$

Let the average age of 30 new members = x years

$$\Rightarrow \text{Total age of the 30 members} = 30x \text{ years}$$

According to ques, new average = 56.3 years

$$\Rightarrow \frac{7284+30x}{120+30} = 56.3$$

$$\Rightarrow 7284 + 30x = 56.3 \times 150 = 8445$$

$$\Rightarrow 30x = 8445 - 7284 = 1161$$

$$\Rightarrow x = \frac{1161}{30} = 38.7$$

\Rightarrow Ans - (D)

Question 82

By selling 175 pineapples, the gain is equal to the selling price of 50 pineapples. What is the gain percentage?

A 28

B 30

C 32

D 40

Answer: D

Explanation:

Let cost price of 1 pineapple = Rs. x and selling price of 1 pineapple = Rs. y

$$\Rightarrow \text{Profit by selling 175 pineapples} = \text{Rs. } 175(y - x)$$

According to ques,

$$\Rightarrow 175(y - x) = 50y$$

$$\Rightarrow 7y - 7x = 2y$$

$$\Rightarrow 7y - 2y = 5y = 7x$$

$$\Rightarrow \frac{y}{x} = \frac{7}{5}$$

Let $y = 7$ and $x = 5$

$$\therefore \text{Profit \%} = \frac{(y-x)}{x} \times 100$$

$$= \frac{7-5}{5} \times 100$$

$$= 2 \times 20 = 40\%$$

\Rightarrow Ans - (D)

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Question 83

If A has got 20% more marks than B, then by what percent marks of B are less than the marks of A?

A 16.67

B 20

C 33.33

D 14.28

Answer: A

Explanation:

Let B's marks = 100

$$\Rightarrow \text{A's marks} = 100 + \left(\frac{20}{100} \times 100\right) = 120$$

$$\therefore \text{Percent by which B's marks are less than A's} = \frac{(120-100)}{120} \times 100$$

$$= \frac{1}{6} \times 100 = 16.67\%$$

\Rightarrow Ans - (A)

Question 84

A train leaves Delhi at 10 a.m. and reaches Jaipur at 4 p.m. on same day. Another train leaves Jaipur at 12 p.m. and reaches Delhi at 5 p.m. on same day. What is the time of day (approximately) when the two trains will meet?

A 1:42 p.m.

B 1:27 p.m.

C 2:04 p.m.

D 1:49 p.m.

Answer: D

Explanation:

Total time taken by first train = 6 hours and second train = 5 hours

$$\therefore \text{speed} \propto \frac{1}{\text{time}}$$

\Rightarrow Let speed of first train = $5x$ km/hr and speed of second train = $6x$ km/hr

\Rightarrow Distance between Delhi and Jaipur = $5x \times 6 = 30x$ km

At 10:00 am, first train starts moving, \Rightarrow distance covered by it in 2 (12-10) hours = $5x \times 2 = 10x$ km

Distance left between the two trains at 12:00 pm = $30x - 10x = 20x$ km

Now, at 12:00 pm both move towards each other, \Rightarrow relative speed = $5x + 6x = 11x$ km/hr

\Rightarrow Time taken to meet each other = $\left(\frac{20x}{11x} \times 60\right)$ minutes ≈ 109 minutes

= 1 hour and 49 minutes

\therefore Time at which they will meet = 12:00 pm + 1 hour and 49 minutes = 1:49 pm

\Rightarrow Ans - (D)

Question 85

The difference between the compound interest compounding half yearly for 1 year and the simple interest for 1 year on a certain sum of money lent out at 8% per annum is Rs 64. What is the sum (in Rs)?

A 40000

B 42000

C 44000

D 44800

Answer: A

Explanation:

Let the given sum = Rs. $100x$

Rate of interest = 8% and time period = 1 year

Compound interest compounded half yearly = $P\left[\left(1 + \frac{R}{200}\right)^{2T} - 1\right]$

$$= 100x\left[\left(1 + \frac{8}{200}\right)^2 - 1\right]$$

$$= 100x \left[\left(\frac{26}{25} \right)^2 - 1 \right] = 100x \left(\frac{676 - 625}{625} \right)$$

$$= 100x \times \frac{51}{625} = \frac{204x}{25}$$

$$\text{Simple interest} = \frac{P \times R \times T}{100}$$

$$= \frac{100x \times 8 \times 1}{100} = 8x$$

$$\Rightarrow \text{Difference between simple and compound interests} = \frac{204x}{25} - 8x = 64$$

$$\Rightarrow \frac{204x - 200x}{25} = 64$$

$$\Rightarrow 4x = 64 \times 25$$

$$\Rightarrow x = \frac{64 \times 25}{4} = 16 \times 25 = 400$$

\therefore Value of given sum = $100 \times 400 = \text{Rs.}40,000$

\Rightarrow Ans - (A)

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Question 86

If $(x - 2)$ and $(x + 3)$ are the factors of the equation $x^2 + k_1x + k_2 = 0$, then what are the values of k_1 and k_2 ?

A $k_1 = 6, k_2 = -1$

B $k_1 = 1, k_2 = -6$

C $k_1 = 1, k_2 = 6$

D $k_1 = -6, k_2 = 1$

Answer: B

Explanation:

$$\text{Equation : } f(x) = x^2 + k_1x + k_2 = 0$$

If $(x - 2)$ and $(x + 3)$ are factors of above equation, then $x = 2, -3$ will satisfy above equation.

$$\Rightarrow f(2) = (2)^2 + k_1(2) + k_2 = 0$$

$$\Rightarrow 2k_1 + k_2 = -4 \text{ -----(i)}$$

$$\text{Similarly, } f(-3) = (-3)^2 + k_1(-3) + k_2 = 0$$

$$\Rightarrow -3k_1 + k_2 = -9 \text{ -----(ii)}$$

Subtracting equation (ii) from (i), we get :

$$\Rightarrow 5k_1 = -4 + 9 = 5$$

$$\Rightarrow k_1 = \frac{5}{5} = 1$$

$$\text{Substituting it in equation (i), } \Rightarrow k_2 = -4 - 2(1) = -4 - 2 = -6$$

\Rightarrow Ans - (B)

Question 87

If $(x - y) = 7$, then what is the value of $(x - 15)^3 - (y - 8)^3$?

A 0

B 343

C 392

D 2863

Answer: A

Explanation:

To find : $(x - 15)^3 - (y - 8)^3$

Let $(x - 15) = a$ and $(y - 8) = b$

Thus, we need to find : $a^3 - b^3$ -----(i)

$\Rightarrow x = a + 15$ and $y = b + 8$ -----(ii)

It is given that, $(x - y) = 7$

Substituting values from equation (ii),

$\Rightarrow (a + 15) - (b + 8) = 7$

$\Rightarrow a - b + 7 = 7$

$\Rightarrow a - b = 0$

Cubing both sides, we get :

$\Rightarrow a^3 - b^3 - 3ab(a - b) = 0$

$\Rightarrow a^3 - b^3 - 3ab(0) = 0$

$\Rightarrow a^3 - b^3 = 0$

\Rightarrow Ans - (A)

Question 88

If $x - y - \sqrt{18} = -1$ and $x + y - 3\sqrt{2} = 1$, then what is the value of $12xy(x^2 - y^2)$?

A 0

B 1

C $512\sqrt{2}$

D $612\sqrt{2}$

Answer: D

Explanation:

Given : $x - y - \sqrt{18} = -1$

$\Rightarrow x - y = \sqrt{18} - 1$ -----(i)

Squaring both sides,

$\Rightarrow (x - y)^2 = (\sqrt{18} - 1)^2$

$\Rightarrow x^2 + y^2 - 2xy = 18 + 1 - 2\sqrt{18}$

$\Rightarrow x^2 + y^2 - 2xy = 19 - 2\sqrt{18}$ -----(ii)

Also, $x + y - 3\sqrt{2} = 1$

$\Rightarrow x + y = \sqrt{18} + 1$ -----(iii)

Squaring both sides,

$\Rightarrow (x + y)^2 = (\sqrt{18} + 1)^2$

$\Rightarrow x^2 + y^2 + 2xy = 18 + 1 + 2\sqrt{18}$

$\Rightarrow x^2 + y^2 + 2xy = 19 + 2\sqrt{18}$ -----(iv)

Subtracting equation (ii) from (iv),

$$\Rightarrow 4xy = 4\sqrt{18}$$

$$\Rightarrow 12xy = 12\sqrt{18} \text{ -----(v)}$$

Multiplying equations (i) and (iii),

$$\Rightarrow (x - y)(x + y) = (\sqrt{18} - 1)(\sqrt{18} + 1)$$

$$\Rightarrow x^2 - y^2 = 18 - 1 = 17 \text{ -----(vi)}$$

Now, multiplying equations (v) and (vi), we get :

$$\Rightarrow 12xy(x^2 - y^2) = (12\sqrt{18}) \times 17$$

$$= 204\sqrt{18} = 612\sqrt{2}$$

\Rightarrow Ans - (D)

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Question 89

If $\frac{p}{q} = \frac{r}{s} = \frac{t}{u} = \sqrt{5}$, then what is the value of $\frac{(3p^2+4r^2+5t^2)}{(3q^2+4s^2+5u^2)}$?

A 1/5

B 5

C 25

D 60

Answer: B

Explanation:

$$\text{Given : } \frac{p}{q} = \frac{r}{s} = \frac{t}{u} = \sqrt{5}$$

$$\Rightarrow p = \sqrt{5}q, r = \sqrt{5}s, t = \sqrt{5}u$$

$$\text{To find : } \left[\frac{(3p^2+4r^2+5t^2)}{(3q^2+4s^2+5u^2)} \right]$$

$$= \frac{3(\sqrt{5}q)^2+4(\sqrt{5}s)^2+5(\sqrt{5}u)^2}{3q^2+4s^2+5u^2}$$

$$= \frac{15q^2+20s^2+25u^2}{3q^2+4s^2+5u^2}$$

$$= \frac{5(3q^2+4s^2+5u^2)}{3q^2+4s^2+5u^2} = 5$$

\Rightarrow Ans - (B)

Question 90

In triangle ABC, a line is drawn from the vertex A to a point D on BC. If BC = 9 cm and DC = 3 cm, then what is the ratio of the areas of triangle ABD and triangle ADC respectively?

A 1 : 1

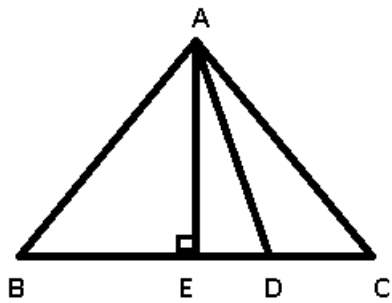
B 2 : 1

C 3 : 1

D 4 : 1

Answer: B

Explanation:



Given : $BC = 9$ cm and $DC = 3$ cm and $AE = h$ cm

$\Rightarrow BD = 9 - 3 = 6$ cm

Now, area of $\triangle ABD = \frac{1}{2} \times (BD) \times (AE)$

$$= \frac{1}{2} \times 6 \times h = 3h \text{ cm}^2$$

Similarly, area of $\triangle ADC = \frac{1}{2} \times 3 \times h = 1.5h \text{ cm}^2$

$$\therefore \text{Required ratio} = \frac{3h}{1.5h} = \frac{2}{1}$$

\Rightarrow Ans - (B)

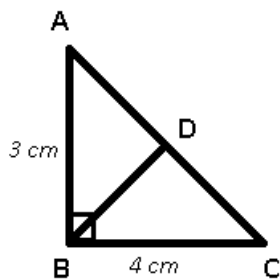
Question 91

ABC is a right angled triangle in which $\angle B = 90^\circ$. If $BD \perp AC$, $AB = 3$ cm and $BC = 4$ cm, then what is the value of BD (in cm)?

- A $12/5$
- B $36/5$
- C 5
- D 2.5

Answer: A

Explanation:



In $\triangle ABC$,

$$\Rightarrow (AC)^2 = (AB)^2 + (BC)^2$$

$$\Rightarrow (AC)^2 = (3)^2 + (4)^2$$

$$\Rightarrow (AC)^2 = 9 + 16 = 25$$

$$\Rightarrow AC = \sqrt{25} = 5 \text{ cm}$$

Now, area of $\triangle ABC = \frac{1}{2} \times (AB)(BC) = \frac{1}{2} \times (AC)(BD)$

$$\Rightarrow BD = \frac{3 \times 4}{5}$$

$$\Rightarrow BD = \frac{12}{5} \text{ cm}$$

\Rightarrow Ans - (A)

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Question 92

In triangle PQR, A is the point of intersection of all the altitudes and B is the point of intersection of all the angle bisectors of the triangle. If $\angle PBR = 105^\circ$, then what is the value of $\angle PAR$ (in degrees)?

- A 60
- B 100
- C 75
- D 115

Answer: C

Explanation:

angle at orthocenter and vertex are supplementary

Question 93

If there are four lines in a plane, then what cannot be the number of points of intersection of these lines?

- A 0
- B 5
- C 4
- D 7

Answer: D

Explanation:

Maximum number of intersection points of n lines = $\frac{n(n-1)}{2}$

Thus, in a plane of 4 lines, maximum intersection points = $\frac{4 \times 3}{2} = 6$

=> 7 is not possible.

=> Ans - (D)

Question 94

What is the simplified value of $\operatorname{cosec}2A + \cot2A$?

- A $\sec A$
- B $\sec(A/2)$
- C $\cot A$
- D $\cot^2 A$

Answer: C

Explanation:

Expression : $\operatorname{cosec}2A + \cot2A$

$$= \frac{1}{\sin 2A} + \frac{\cos 2A}{\sin 2A}$$

$$= \frac{1 + \cos 2A}{\sin 2A}$$

$$\begin{aligned}
 &= \frac{1+(2\cos^2 A-1)}{2\sin A \cos A} \\
 &= \frac{2\cos^2 A}{2\sin A \cos A} \\
 &= \frac{\cos A}{\sin A} = \cot A \\
 \Rightarrow \text{Ans - (C)}
 \end{aligned}$$

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Question 95

If $A = 30^\circ$, $B = 60^\circ$ and $C = 135^\circ$, then what is the value of $\sin^3 A + \cos^3 B + \tan^3 C - 3\sin A \cos B \tan C$?

- A 0
- B 1
- C 8
- D 9

Answer: A

Explanation:

Given : $A = 30^\circ$, $B = 60^\circ$ and $C = 135^\circ$

To find : $\sin^3 A + \cos^3 B + \tan^3 C - 3\sin A \cos B \tan C$

$$\begin{aligned}
 &= [\sin(30^\circ)]^3 + [\cos(60^\circ)]^3 + [\tan(135^\circ)]^3 - 3[\sin(30^\circ)][\cos(60^\circ)][\tan(90^\circ)] \\
 &= \left(\frac{1}{2}\right)^3 + \left(\frac{1}{2}\right)^3 + (-1)^3 - 3\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)(-1) \\
 &= \frac{1}{8} + \frac{1}{8} - 1 + \frac{3}{4} \\
 &= \frac{1}{4} - \frac{1}{4} = 0
 \end{aligned}$$

\Rightarrow Ans - (A)

Question 96

What is the least value of $\tan^2 \theta + \cot^2 \theta + \sin^2 \theta + \cos^2 \theta + \sec^2 \theta + \operatorname{cosec}^2 \theta$?

- A 1
- B 3
- C 5
- D 7

Answer: D

Explanation:

Expression : $\tan^2 \theta + \cot^2 \theta + \sin^2 \theta + \cos^2 \theta + \sec^2 \theta + \operatorname{cosec}^2 \theta$

Using, $(\sec^2 \theta - \tan^2 \theta = 1)$ and $(\operatorname{cosec}^2 \theta - \cot^2 \theta = 1)$

$$\begin{aligned}
 &= (\sin^2 \theta + \cos^2 \theta) + \tan^2 \theta + \cot^2 \theta + (1 + \tan^2 \theta) + (1 + \cot^2 \theta) \\
 &= 1 + 1 + 1 + 2\tan^2 \theta + 2\cot^2 \theta \\
 &= 3 + 2(\tan^2 \theta + \cot^2 \theta)
 \end{aligned}$$

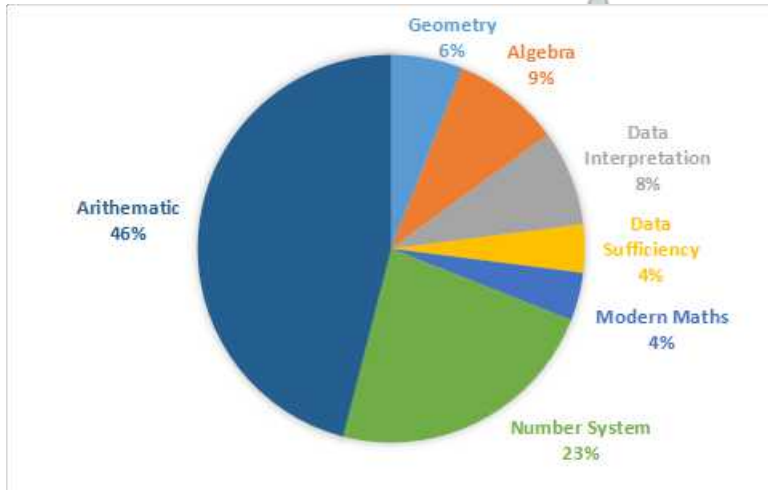
Minimum value of $(\tan^2 \theta + \cot^2 \theta) = 2$

$$= 3 + 2(2) = 3 + 4 = 7$$

=> Ans - (D)

Instructions

The pie chart given below shows the break-up of number of hours of teaching various subjects at an institute by Mr. Raghav.



Question 97

If Mr. Raghav taught a total of 500 hours, then what is the difference in number of hours of teaching algebra and modern Maths?

- A 15
- B 20
- C 25
- D 40

Answer: C

Explanation:

Difference in time taken to teach algebra and modern Maths (in %) = $9 - 4 = 5\%$

Total time = 500 hours

$$\Rightarrow \text{Required time} = \frac{5}{100} \times 500$$

= 25 hours

=> Ans - (C)

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Question 98

Mr. Raghav taught Geometry for 36 hours. If the time taken in teaching Ratio constitutes one-fourth of the time for Arithmetic, then for how much time (in hours) did he taught the topic of Ratio?

- A 46
- B 51.75
- C 69
- D 103.5

Answer: C

Explanation:

Let total time taken = $100x$ hours

Time taken to teach Geometry = $\frac{6}{100} \times 100x = 6x$ hours

According to ques, $\Rightarrow 6x = 36$

$$\Rightarrow x = \frac{36}{6} = 6$$

\Rightarrow Time taken to teach Arithmetic = $\frac{46}{100} \times 100x = 46x$ hours

$$= 46 \times 6 = 276 \text{ hours}$$

\therefore Time required to teach ratio = $\frac{276}{4} = 69$ hours

\Rightarrow Ans - (C)

Question 99

If Data Interpretation and Modern Maths were taught for a combined time of 96 hours, then for how much time (in hours) were Number system and Geometry taught?

A 136

B 184

C 216

D 232

Answer: D

Explanation:

Time given to Data Interpretation and Modern Maths (in %) = $8+4 = 12\%$

Time given to Number system and Geometry taught (in %) = $23+6 = 29\%$

According to ques, $\Rightarrow 12\% \equiv 96$ hours

$$\Rightarrow 29\% \equiv \frac{96}{12} \times 29$$

$$= 8 \times 29 = 232 \text{ hours}$$

\Rightarrow Ans - (D)

Question 100

A new topic named Problem Solving was also introduced and it was decided that 10% time of all topics except Arithmetic will be devoted to it. What will be the central angle (in degrees) made by Problem Solving in the new pie chart?

A 17.28

B 18

C 19.44

D 36

Answer: C

Explanation:

Total time (in %) given to all topics except arithmetic = $(100-46)\% = 54\%$

$$\Rightarrow \text{Total time (in \%)} \text{ given to problem solving} = \frac{10}{100} \times 54 = 5.4\%$$

$$\therefore \text{Central angle} = \frac{5.4}{100} \times 360$$

$$= 19.44^\circ$$

\Rightarrow Ans - (C)

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