



SSC CHSL 8 July 2019 Shift-2

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Reasoning

Instructions

For the following questions answer them individually

Question 1

Three of the following four numbers are alike in a certain way and one is different. Pick the number that is different from the rest.

- A 336
- B 224
- C 226
- D 448

Answer: C

Explanation:

In each option except option C the third number is the addition of the first and second one. But in option C the number is 226 but $2+2=4$. So this option is not following the logic.

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Question 2

Arrange the following activities in a logical and meaningful order.

1. Setting up alarm clock
2. Solving question paper
3. Alarm Bell ringing
4. Reach examination center
5. Getting dressed and be ready
6. Returning answer book

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

Answer: D

Explanation:

If we arrange the given events in a logical manner then at first we have to Set up the alarm clock. Then Alarm Bell will ring. Then we have to dressed up and be ready. Then we will Reach the examination center. After that we have to Solve the question paper. And at last we have to return the answer book. So in option D the correct sequence is given.

Question 3

Select the set in which the numbers are related in the same way as are the numbers of the following set.

(8, 39, 5)

- A (11, 67, 8)
- B (10, 60, 6)
- C (9, 55, 4)
- D (14, 115, 9)

Answer: D

Explanation:

The middle number is arrived by the difference between the square of other two numbers.

In the given statement, square of 8 i.e; 64 and square of 5 i.e; 25

Now, $(64-25) = 39$

Similarly in option D, square of 14 = 196 and square of 9 = 81

$(196-81)=115$

Question 4

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:

Some plants are vegetable.

All vegetables are vitamins.

Conclusions:

I. Some vitamins are plants.

II. Some vitamins are vegetables.

III. No vitamin is plant.

A Either conclusion I or III follows.

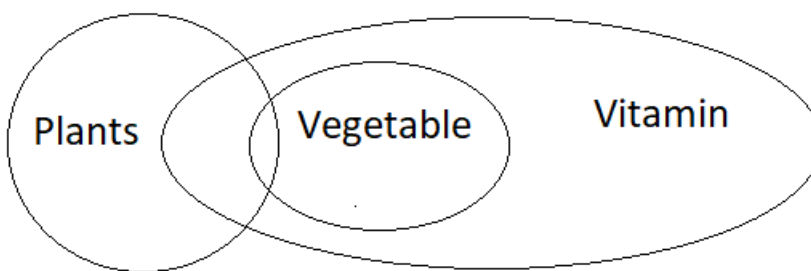
B Only conclusions II and III follow.

C Only conclusions I and II follow.

D Only conclusions I and III follow.

Answer: C

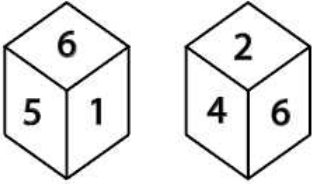
Explanation:



Here from the above Venn diagram it is clear that conclusion 1 i.e; some vitamins are plants and conclusion 2 i.e; some vitamins are vegetables are true but not conclusion 3. So, option C is the correct answer.

Question 5

Two different positions of the same dice are shown below, the six faces of which are numbered 1 to 6. Find the number opposite to the face having 3.



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

Answer: B

Explanation:

In the given dice 6 is present in both the dice. And 1,2,4 and 5 are in the adjacent surface of 6. So, 6 can't be in the opposite surface of 1,2,4 and 5. Only 3 is left. So, 6 will be in the opposite surface of 3.

Question 6

$A + B$ means 'A is sister of B'

$A - B$ means 'A is son of B'

$A \times B$ means 'A is father of B'

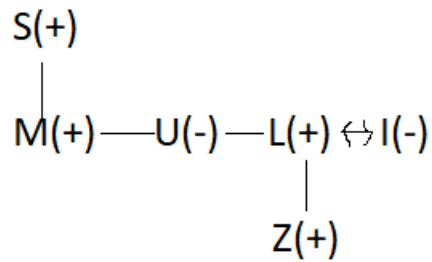
$A \div B$ means 'A is brother of B'

If $S \times M \div U + L \times Z - I$, then how is L related to I?

- A Husband
- B Son
- C Father
- D Brother

Answer: A

Explanation:



Here, (+) means male and (-) means female. Here, S is the father of M, U, and L. Z is the son of L and I. So, L is the husband of I.

Question 7

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

- A Ulcer
- B Anaemia
- C Hormone
- D Hypertension

Answer: C

Explanation:

Here all except option C are the names of different disease but hormone is not a disease. It is a substance in our body that influences growth and development.

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Question 8

If CALLOSUM is coded as 31336134, then how will CEREMONY be coded as ?

- A 25945757
- B 35854656
- C 35954547
- D 35954657

Answer: D

Explanation:

Here, the coding is done according to the place value of the letters according to the English alphabetical series.

C=3, A=1, L=12=1+2=3, O=15=1+5=6, S=19=1+9=10=1, U=21=2+1=3, M=13=1+3=4.

Similarly,

CEREMONY=

C=3, E=5, R=18=1+8=9, E=5, M=13=1+3=4, O=15=1+5=6, N=14=1+4=5, Y=25=2+5=7.

Question 9

Select the option that is related to the third letter-cluster in the same way as the second letter-cluster is related to the first letter-cluster.

DHMR : BJKT :: XCOE : ?

- A VFMH
- B VENG
- C UENG
- D VEMG

Answer: D

Explanation:

4	8	13	18
D	H	M	R
B	J	K	T
2	10	11	20

24	3	15	5
X	C	O	E
V	E	M	G
22	5	13	7

Here, the first and third letter of the given word are coded by the (place value of the given letter-2) and second and fourth letter are coded by (place value of the given letter+2).

Question 10

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

6 4 E K P C 9 2

- A 2 9 C P K E 4 6
- B 2 9 C P K E 4 6
- C 2 9 C P K E 4 6
- D 6 4 E K P C 9 2

Answer: B

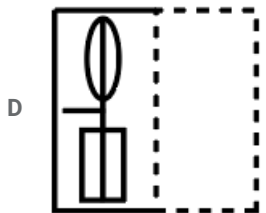
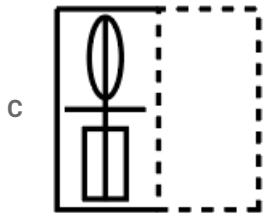
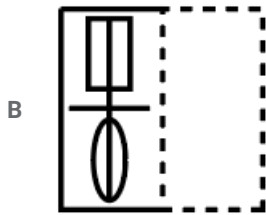
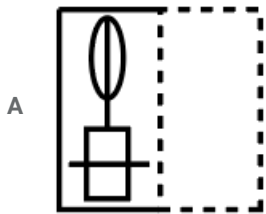
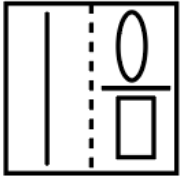
Explanation:

If we place the mirror to the right side then the letter or number which is nearest to the mirror will be nearest after the formation of mirror image and the letters and numbers are changed accordingly.

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Question 11

A figure of transparent sheet with a pattern is given below. Select the option that shows how the pattern would appear when the transparent sheet is folded at the dotted line.



Answer: C

Explanation:

If we assume the dotted line as a mirror then the structures on the paper will represent as it is but on the other side there is a straight line so the answer figure will look like option C.

Question 12

'Mercury' is related to 'Metal' in the same way as 'Frog' is related to '_____'.
A Rodent

- B Reptilian
- C Amphibian
- D Mammal

Answer: C

Explanation:

Mercury is a type of metal so it is related to metal. Similarly, Frog is a type of amphibian so it is related to it.

Question 13

Select the number-pair in which the two numbers are related in the same way as are the two numbers of the following number-pair.
11 : 120

- A 17 : 289
- B 12 : 144
- C 2 : 3
- D 8 : 65

Answer: C

Explanation:

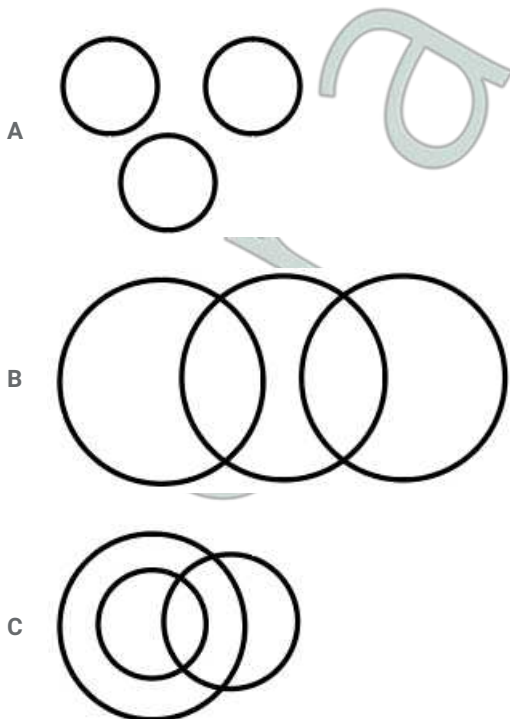
In the given question square of 11 is 121, now $121 - 1 = 120$.

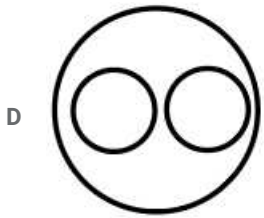
Similarly square of 2 is 4 and $4 - 1 = 3$. So, 2:3 is the answer.

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Question 14

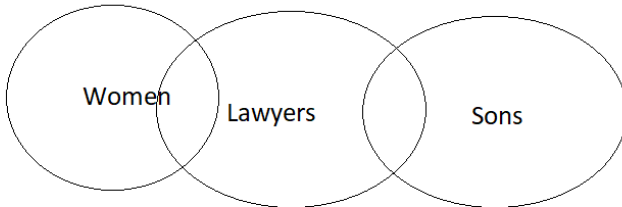
Select the Venn diagram that best illustrates the relationship between the following classes.
Women, Lawyers, Sons





Answer: B

Explanation:



Here lawyers can be male and female so some women can be lawyer and some sons can be lawyer so they are intersecting but sons cant be women.

Question 15

Which number will replace the question mark (?) in the following series?
55, 56, 64, 91, 155, ?

- A 280
- B 265
- C 275
- D 270

Answer: A

Explanation:

55 56 64 91 155
 1 8 27 64

Here the differences are cubes of consecutive even numbers i.e; 1,8,27 and 64 are cubes of 1,2,3,4. So the next difference will be 125 and the number in the series will be $155+125= 280$

Question 16

Select the option in which Figure-X is embedded. (Rotation is not allowed)

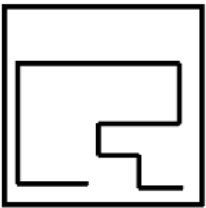
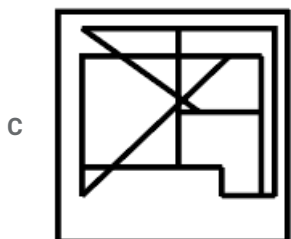
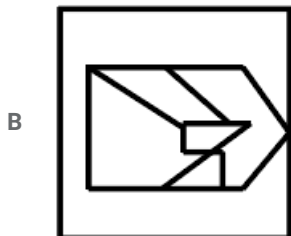
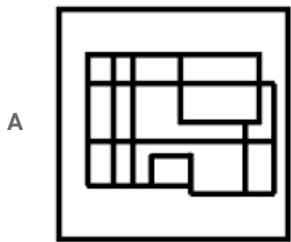
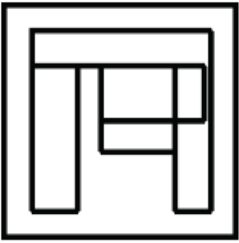


Figure-X



D



Answer: D

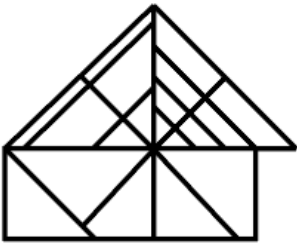
Explanation:

Among the given options the figure X is embedded in the last figure i.e; option D.

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Question 17

How many triangles are present in the given figure ?



A 27

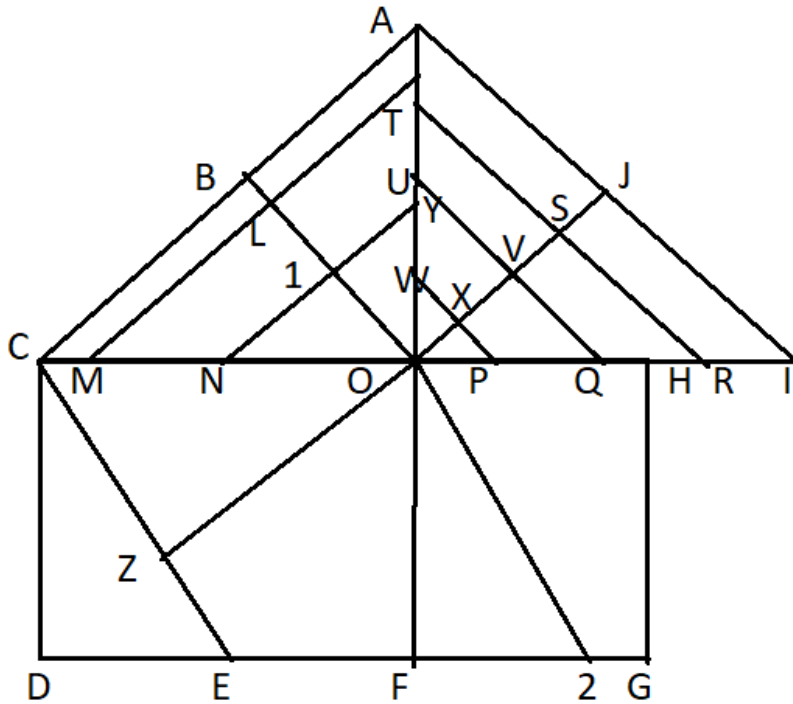
B 26

C 24

D 25

Answer: D

Explanation:



Here the triangles are-

ACI, ACO, AOI, CDE, CZO, OF2, BCO, OIJ, ABO, AOJ, KLO, MLO, TRO, UQO, WPO, N1O, Y1O, TSO, SOR, UVO, VQO, WXO, XOP, NYO, MKO.

Question 18

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

- A DGJM
- B BDGJ
- C TWZC
- D KNQT

Answer: B

Explanation:

In all of the options except option B, the letters are increasing by 3 place values.

For ex- In option A, D=4, G=7, J=10, M=13.

But in option B, B=2, D=4, G=7, J=10.

Here instead of D it should be E.

Question 19

Three friends A, B and C have different amounts of rupees with them. If A takes ₹10 from B, then A will have ₹4 less than C. A and C together have total ₹330. How many rupees does C have ?

- A 176
- B 170
- C 172
- D 174

Answer: C



Explanation:

$$A + C = 330$$

Now, If A takes Rs. 10 from B then A has RS. (A+10) with him.

$$A + 10 = C - 4$$

$$\Rightarrow A - C = -14$$

And we know that $A + C = 330$

Solving these two equation we get,

$$2A = 330 - 14$$

$$A = 158.$$

$$\text{Then, } C = 330 - 158$$

$$= 172.$$

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Question 20

Select the combination of letters that when sequentially placed in the gaps of the given letter series will complete the series.

u _ _ m p m _ _ u u c m _ m m j _ u c _ p m m _

A u c m j p u m j

B u c m j u u m m

C u c u j p m m j

D p c j m p u m j

Answer: A

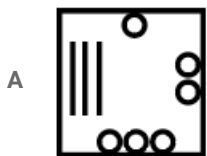
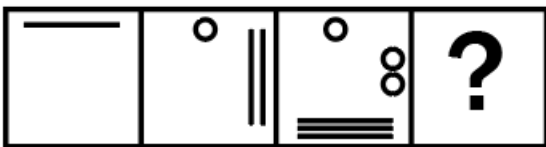
Explanation:

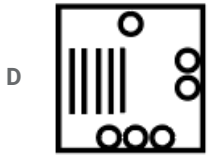
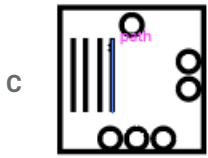
u u c m p m m j | u u c m p m m j | u c m p m m j

Here we divide the series in 3 parts. Each part have the same sequence. First two letters are 'u', then 'm' then 'p', then two 'm' and then 'j'. In this logic three parts are made.

Question 21

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





Answer: C

Explanation:

Here, the straight lines are moving in 90 degree clockwise direction and every time it increases by 1 straight line. So in the answer figure four straight line is needed. And circles are also moving in 90 degree clockwise direction and it also increases by 1 circle. So in the answer figure three circle is needed.

Question 22

Select the set in which the numbers are related in the same way as are the numbers of the following set.
(145, 65, 115)

- A (185, 65, 170)
- B (80, 50, 110)
- C (185, 70, 95)
- D (130, 70, 100)

Answer: C

Explanation:

In the given question $145+115=260$ Now, if we divide 260 by 4 we will get 65.

Similarly, $185+95=280$, and if we divide 280 by 4 then we will get 70.

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Question 23

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.

Temple : Worship

- A School : Education
- B University : Professor
- C Hotel : Expenditure
- D Hospital : Doctor

Answer: A

Explanation:

In the given question we go to temple to worship and similarly we go to school for education.

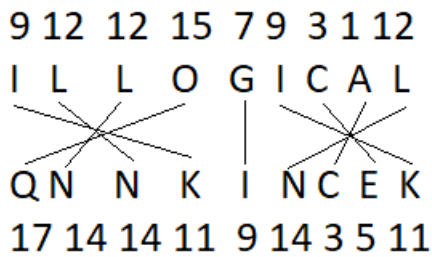
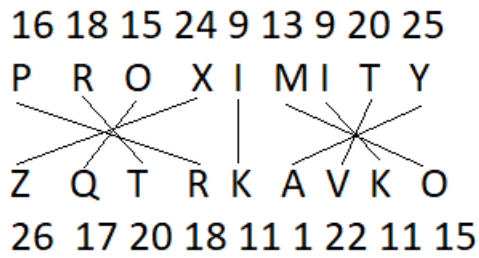
Question 24

In a code language, PROXIMITY is written as ZQTRKAVKO. How will ILLOGICAL be written as in that language?

- A QNNKINCEK
- B QMMKIMCEK
- C RNNLINCEK
- D QNNLINBEL

Answer: A

Explanation:



In above two coding 2 is added according to the arrows.

Question 25

Which two numbers should be interchanged in the following equation to make it correct?

$$779 + 14 \times 21 - 532 \div 41 = 807$$

- A 779 and 21
- B 532 and 779
- C 21 and 41
- D 532 and 41

Answer: B

Explanation:

If we interchange 532 and 779 then, according to the BODMAS rule,

$$779 + 14 \times 21 - 532 \div 41 = 807$$

$$= 532 + 14 \times 21 - 779 \div 41$$

$$= 532 + 294 - 19$$

$$= 807$$

General knowledge

Instructions

For the following questions answer them individually

Question 26

_____ attacked the southern coast of Kathiawar along the Arabian Sea, where he sacked the city of Somnath and its renowned Hindu temple in 1026.

- A Mahmud of Ghazni
- B Ahmed Shah Tugalaq
- C Muhammad Ghori
- D Firoz Shah Tugalaq

Answer: A

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Question 27

In Economics, buying an asset in one market and simultaneously selling an identical asset in another market at a higher price is termed as _____.

- A Depreciation
- B Devaluation
- C Arbitrage
- D Mortgage

Answer: C

Question 28

In 2018, Bharat Vatwani and _____ were the two Indians awarded with the Ramon Magsaysay award.

- A Rajendra Singh
- B Sathyabhama Das Biju
- C Arvind Kejriwal
- D Sonam Wangchuk

Answer: D

Question 29

_____ is the process by which water vapour in the air is changed into liquid water.

- A Decantation
- B Condensation
- C Evaporation
- D Precipitation

Answer: B

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Question 30

With which of the following sports is the term 'tumble turns' associated?

- A Running
- B Cycling
- C Long Jump
- D Swimming

Answer: D

Question 31

_____ is a large mass of snow and ice at an high altitude that slides down mountain slopes.

- A Volcano
- B Cyclone
- C Avalanche
- D Hurricane

Answer: C

Question 32

The historical Sher Shah Suri Marg is called as:

- A National Highway Number 23
- B National Highway Number 1
- C National Highway Number 11
- D National Highway Number 8

Answer: B

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Question 33

With which of the following sports is the term 'bib' associated? The word refers to sheets printed with numbers.

- A Running
- B Lawn Tennis
- C Hockey
- D Football

Answer: A

Question 34

Members of Parliament Local Area Development Scheme (MPLADS) was introduced in December _____.

- A 1991
- B 2014
- C 2004
- D 1993

Answer: D

Question 35

What was India's rank in the year 2018 in world Crude Steel production according to Steel Users Federation of India?

- A First
- B Third
- C Fourth
- D Second

Answer: D

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Question 36

Chakri' is a type of traditional music that is popular in the Indian state of _____.

- A Madhya Pradesh
- B Rajasthan
- C Jammu and Kashmir
- D Punjab

Answer: C

Explanation:

Chakri is one of the most popular types of traditional music played in Jammu & Kashmir.

Question 37

What is the chemical name of slaked lime?

- A Calcium Hydroxide
- B Calcium Chloride
- C Sodium Chloride
- D Calcium Nitrate

Answer: A

Question 38

Google was founded in 1998 by Larry Page and _____.

- A Sergey Brin
- B Peter Thiel
- C Steve Wozniak
- D Elon Musk

Answer: A

Explanation:

Google was founded in September 1998 by Larry Page and **Sergey Brin** while they were **Ph.D.** students at Stanford University in California. Together they own about 14 percent of its shares and control 56 percent of the stockholder voting power through super voting stock.

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Question 39

Who wrote the book 'An Era of Darkness: The British Empire in India'?

- A Ramchandra Guha
- B Shashi Tharoor
- C A P J Abdul Kalam
- D Sudha Murthy

Answer: B

Question 40

World Metrology Day' was celebrated in India on _____ in 2019.

- A 25th January
- B 18th April
- C 20th May
- D 17th February

Answer: C

Question 41

Jawaharlal Nehru port is located in:

- A West Bengal
- B Kerala
- C Andra Pradesh
- D Maharashtra

Answer: D

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Question 42

To which of the following states does the folk song 'Bhawaiya' belong ?

- A Odisha
- B West Bengal
- C Chhattisgarh
- D Jharkhand

Answer: B

Question 43

After going through the processes of scouring and bleaching, 99% of cotton is made up of which polymer?

- A Proteins
- B Epoxy
- C Cellulose
- D Teflon

Answer: C

Question 44

In May 2019, Pakistan successfully test-fired a surface-to-surface ballistic missile named _____.

- A Musafir II
- B Shaheen II
- C Watan I
- D Salaam III

Answer: B

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Question 45

In May 2019, Former Miss World Priyanka Chopra visited _____ as UNICEF's Goodwill Ambassador for humanitarian work.

- A Ethiopia
- B Uganda
- C Democratic Republic Of Congo
- D Kenya

Answer: A

Question 46

The Chola Empire was invaded by _____ in the early 14th century A.D.

- A Malik Kafur
- B Genghis Khan
- C Muhammad Ghori
- D Taimur

Answer: A

Question 47

Kalumar Peak is the highest point in _____ range.

- A Aravalli
- B Vindhaya
- C Satpura
- D Karakoram

Answer: B

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Question 48

A _____ is the main printed circuit board (PCB) in a computer.

- A CPU (Central Processing Unit)
- B Motherboard
- C ROM (Read only Memory)
- D RAM (Random Access Memory)

Answer: B

Question 49

The powers, privileges and immunities of either House of Parliament and of its Committees and Members have mainly been laid down in article _____ of the Constitution of India.

- A 107
- B 102
- C 115
- D 105

Answer: D

Question 50

_____ is the first Indian gymnast to win a Gold medal at a Global Event in the World Challenge Cup in Turkey.

- A Rakesh Patra
- B Ashish Kumar
- C Dipa Karmakar
- D Aruna Reddy

Answer: C

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Quant

Instructions

For the following questions answer them individually

Question 51

The compound interest on a certain sum of money at 11% for 2 years is ₹6963. Its simple interest (in ₹) at the same rate and for the same period is:

- A ₹6750
- B ₹6600
- C ₹6000
- D ₹6500

Answer: B

Explanation:

Given, Compound interest (C.I) = ₹6963

Rate (R%) = 11%, Time (T) = 2 years

Let the Principal Amount be P

$$\Rightarrow 6963 = P \left(1 + \frac{11}{100}\right)^2 - P$$

$$\Rightarrow 6963 = P \left(\frac{111}{100}\right)^2 - P$$

$$\Rightarrow 6963 = P \left(\frac{12321}{10000}\right) - P$$

$$\Rightarrow 6963 = \frac{2321}{10000} P$$

$$\Rightarrow P = 3 \times 10000$$

$$\Rightarrow P = ₹30000$$

$$\therefore \text{Simple Interest} = \frac{PTR}{100} = \frac{30000 \times 2 \times 11}{100} = ₹6600$$

Hence, the correct answer is Option B

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Question 52

The average age of fifteen persons is 32 years. If two more persons are added then the average is increased by 3 years. The new persons have an age difference of 7 years between them. The age (in years) of the elder among the new persons is:

- A 50

- B 58
- C 61
- D 54

Answer: C

Explanation:

given that the average age of 15 people is 32

so, sum is $15 \times 32 = 480$

given that two more persons are added so that the avg is increased by 3

and also given that the age difference of 2 members is 7

so we can consider the ages as x and $x+7$

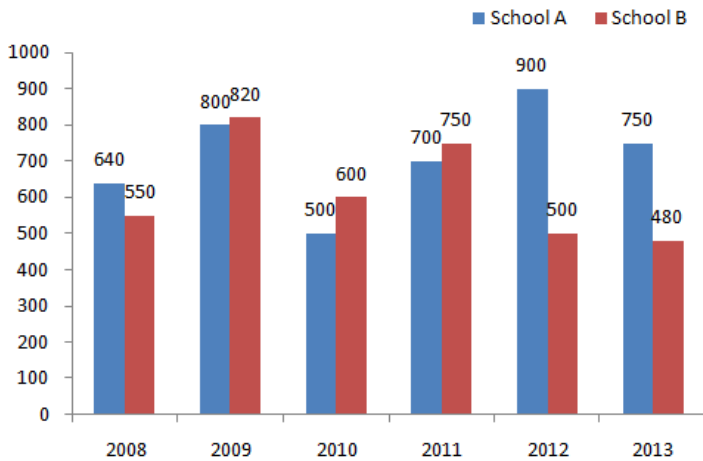
$$480 + x + x + 7 = 17 \times 35$$

$$487 + 2x = 595$$

$$x = 72$$

Question 53

The given Bar Graph presents the number of students of two schools for six years.



What is the average of the number of students from school A during the six year period ?

- A 715
- B 700
- C 765
- D 760

Answer: A

Explanation:

The average number of students from school A during six year period = $\frac{640+800+500+700+900+750}{6} = \frac{4290}{6} = 715$

Question 54

If $6^{\sqrt[4]{x}} + 8^{\sqrt[4]{x}} = 10^{\sqrt[4]{x}}$, then the value of x is:

- A 4
- B 16
- C 2

D 8

Answer: B

Explanation:

$$6\sqrt[4]{x} + 8\sqrt[4]{x} = 10\sqrt[4]{x}$$

It is a pythagoras triplet in the form of $6^2 + 8^2 = 10^2$

$$\Rightarrow \sqrt[4]{x} = 2$$

$$x = 2^4$$

$$x = 16$$

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Question 55

If in a $\triangle ABC$, the bisectors of $\angle B$ and $\angle C$ meet at O, inside the triangle. If $\angle BOC = 156^\circ$, then the measure of $\angle A$ is:

A 132°

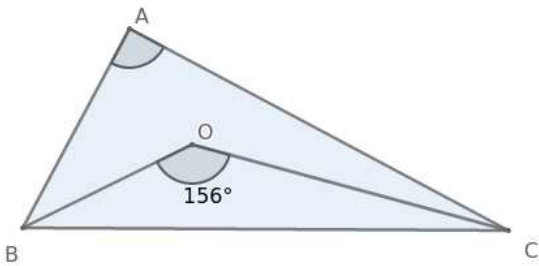
B 156°

C 66°

D 84°

Answer: A

Explanation:



From the figure,

OB and OC are angular bisectors of $\angle B$ and $\angle C$

$$\Rightarrow \angle OBC = \frac{\angle B}{2} \text{ and } \angle OCB = \frac{\angle C}{2}$$

$$\Rightarrow \angle B = 2\angle OBC \text{ and } \angle C = 2\angle OCB$$

In $\triangle OBC$,

$$\angle BOC + \angle OBC + \angle OCB = 180^\circ$$

$$\Rightarrow 156^\circ + \angle OBC + \angle OCB = 180^\circ$$

$$\Rightarrow \angle OBC + \angle OCB = 180^\circ - 156^\circ$$

$$\Rightarrow \angle OBC + \angle OCB = 24^\circ \dots\dots\dots(1)$$

$$\angle A + \angle B + \angle C = 180^\circ$$

$$\Rightarrow \angle A + 2\angle OBC + 2\angle OCB = 180^\circ$$

$$\Rightarrow \angle A + 2(\angle OBC + \angle OCB) = 180^\circ$$

$$\Rightarrow \angle A + 2(24^\circ) = 180^\circ$$

$$\Rightarrow \angle A = 180^\circ - 48^\circ$$

$$\Rightarrow \angle A = 132^\circ$$

Hence, the correct answer is Option A

Question 56

The sum of the salaries of A and B together is ₹43000. A spends 95% of his salary and B, 80% of his salary. If now their savings are the same, what is B's salary (in ₹)?

A 8000

B 8600

C 34400

D 10600

Answer: B

Explanation:

given that salary of A and B is 43000

given that A has spent 95% of his salary and B has spent 80% of the salary

so the savings of A is 5% and savings of B is 20%

also given that savings of both A and B are equal

$$0.05A = 0.2B$$

$$\text{i.e; } A = 4B$$

we know that $A + B = 43000$

$$\text{so } 4B + B = 43000$$

$$5B = 43000$$

$$B = 8600$$

Hence answer is option B

Question 57

A and B can complete a piece of work in 15 days and 10 days respectively. They got a contract to complete the work for ₹35000. The share of B (in ₹) in the contracted money will be:

A ₹15000

B ₹14000

C ₹21000

D ₹7000

Answer: C

Explanation:

Let the total work be T

$$\text{Work done by A in 1 day} = \frac{T}{15}$$

$$\text{Work done by B in 1 day} = \frac{T}{10}$$

$$\text{Ratio of their shares} = \frac{T}{15} : \frac{T}{10} = 10 : 15 = 2 : 3$$

$$\text{Share of B} = \frac{3}{5} \times 35000 = 21000$$

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Question 58

There is a polygon of 11 sides. How many triangles can be drawn by only using the vertices of the polygon?

- A 180
- B 150
- C 165
- D 175

Answer: C

Explanation:

Given,

Number of sides of the polygon = 11

\Rightarrow Number of vertices of the polygon = 11

Number of vertices of the triangle = 3

Number of possibilities of selecting 3 from 11 = ${}^{11}C_3 = \frac{11 \times 10 \times 9}{1 \times 2 \times 3} = 165$

\therefore Number of triangles that can be drawn by only using the vertices of the polygon of 11 sides = 165

Hence, the correct answer is Option C

Question 59

The ratio between the speeds of two trains is 2 : 5. If the first train runs 350 km in 5 hours, then the sum of the speed (in km/h) of both the trains is:

- A 265
- B 350
- C 245
- D 180

Answer: C

Explanation:

Let the speed of two trains be $2p$ and $5p$ respectively

Speed of first train = $\frac{350}{5} = 70$ km/hr

$\Rightarrow 2p = 70$

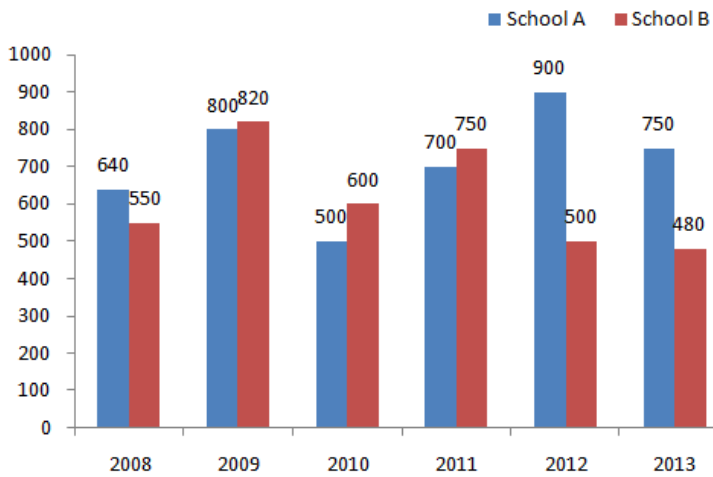
$\Rightarrow p = 35$

\therefore Sum of the speed of both trains = $2p + 5p = 7p = 7(35) = 245$ km/hr

Hence, the correct answer is Option C

Instructions

The given Bar Graph presents the number of students of two schools for six years.



Question 60

What is the ratio of the number of students taken for all years together from school A to that from school B ?

- A 370 : 429
- B 417 : 401
- C 401 : 417
- D 429 : 370

Answer: D

Explanation:

Total number of students in school A in all years = $640 + 800 + 500 + 700 + 900 + 750 = 4290$

Total number of students in school B in all years = $550 + 820 + 600 + 750 + 500 + 480 = 3700$

∴ Required ratio = $4290 : 3700 = 429 : 370$

Hence, the correct answer is Option D

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Question 61

In which year, the absolute difference of the students in two schools is the lowest ?

- A 2009
- B 2011
- C 2012
- D 2008

Answer: A

Explanation:

From the bar graph,

The absolute difference of the students in two schools in 2008 = $|640 - 550| = 90$

The absolute difference of the students in two schools in 2009 = $|800 - 820| = 20$

The absolute difference of the students in two schools in 2011 = $|700 - 750| = 50$

The absolute difference of the students in two schools in 2012 = $|900 - 500| = 400$

∴ The absolute difference of the students in two schools in 2009 is the lowest

Hence, the correct answer is Option A

Instructions

For the following questions answer them individually

Question 62

If $\cos x = \frac{-\sqrt{3}}{2}$ and $\pi < x < \frac{3\pi}{2}$, then the value of $2 \cot^2 x - 3 \sec^2 x$ is:

- A 4
- B 2
- C 8
- D 16

Answer: B

Explanation:

$$\text{Given, } \cos x = \frac{-\sqrt{3}}{2}$$

$$\Rightarrow \sec x = \frac{-2}{\sqrt{3}}$$

$$\therefore 2 \cot^2 x - 3 \sec^2 x = \tan^2 x - 3 \sec^2 x$$

$$= \sec^2 x - 1 - 3 \sec^2 x$$

$$= \left(\frac{-2}{\sqrt{3}}\right)^2 - 1 - 3 \left(\frac{-2}{\sqrt{3}}\right)^2$$

$$= \frac{4}{3} - 1 - 3 \left(\frac{4}{3}\right)$$

$$= \frac{4-3}{3} - 4$$

$$= 1 - 4$$

$$= -3$$

Hence, the correct answer is Option B

Question 63

Two numbers are in the ratio 3 : 4. On increasing each of them by 30, the ratio becomes 9 : 10. The numbers are:

- A 30, 40
- B 18, 24
- C 15, 20
- D 12, 16

Answer: C

Explanation:

Let the two numbers be $3x, 4x$

According to the problem

$$\frac{3x+30}{4x+30} = \frac{9}{10}$$

$$\Rightarrow 30x + 300 = 36x + 270$$

$$\Rightarrow 6x = 30$$

$$\Rightarrow x = 5$$

\therefore The numbers are $3x, 4x = 3(5), 4(5) = 15, 20$

Hence, the correct answer is Option C

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Question 64

Given is an integer, what is the remainder when $(6n + 3)^2$ is divided by 9 ?

A 1

B 3

C 2

D 0

Answer: D

Explanation:

$$(6n + 3)^2 = (3(2n + 1))^2 = 3^2 \cdot (2n + 1)^2 = 9(2n + 1)^2 = 9k$$

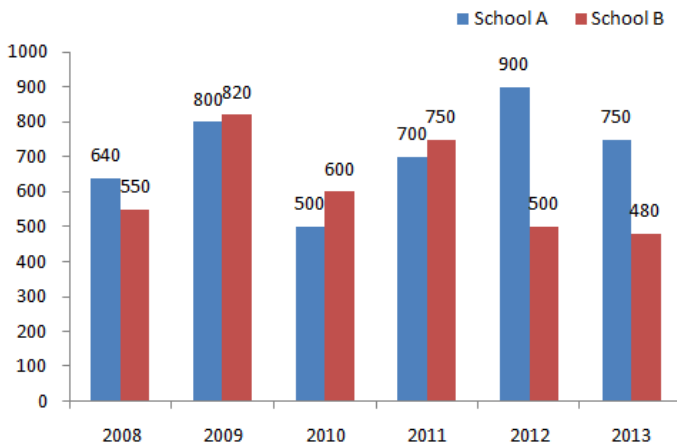
$\therefore (6n + 3)^2$ is a perfect multiple of 9

\Rightarrow The remainder when $(6n + 3)^2$ is divided by 9 is 0

Hence, the correct answer is Option D

Question 65

The given Bar Graph presents the number of students of two schools for six years.



In which year, the percentage increase of students in school A is the highest in comparison to its previous year?

A 2009

B 2012

C 2011

D 2010

Answer: C

Explanation:

There is a decrease in number of students in school A in 2010 compared to its previous year

$$\text{Percentage increase in number of students in school A in 2009 compared to its previous year} = \frac{(800-640)}{640} \times 100 = 25$$

$$\text{Percentage increase in number of students in school A in 2011 compared to its previous year} = \frac{(700-500)}{500} \times 100 = 40$$

$$\text{Percentage increase in number of students in school A in 2012 compared to its previous year} = \frac{(900-700)}{700} \times 100 = 28.5$$

Hence, the correct answer is Option C

Question 66

A dealer buys an article marked at ₹20000 with two successive discounts of 10% and 8%. He spends ₹1440 on repairs and sells it for ₹20000, what is his profit/loss percent (correct to one decimal place)?

- A 12.3% Profit
- B 12.3% loss
- C 11.1% Profit
- D 11.1% loss

Answer: C

Explanation:

Given, Marked Price = ₹20000

$$\text{Price after 10\% discount} = \frac{90}{100} \times 20000 = ₹18000$$

$$\text{Price after 8\% discount} = \frac{92}{100} \times 18000 = ₹16560$$

He spent ₹1440 for its repair

$$\therefore \text{Cost price} = 16560 + 1440 = ₹18000$$

Selling Price = ₹20000

$$\text{Profit Percentage} = \frac{\text{Selling Price} - \text{Cost Price}}{\text{Cost Price}} \times 100 = \frac{20000 - 18000}{18000} \times 100 = \frac{2000}{18000} \times 100 = 11.1\%$$

Hence, the correct answer is Option C

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Question 67

If $4(\operatorname{cosec}^2 66^\circ - \tan^2 24^\circ) + \frac{1}{2} \sin 90^\circ - 4 \tan^2 66^\circ y \tan^2 24^\circ = \frac{y}{2}$, then the value of y is:

- A $\frac{-1}{2}$
- B -1
- C $\frac{1}{2}$
- D 1

Answer: D

Explanation:

$$4(\operatorname{cosec}^2 66^\circ - \tan^2 24^\circ) + \frac{1}{2} \sin 90^\circ - 4 \tan^2 66^\circ y \tan^2 24^\circ = \frac{y}{2}$$

$$\Rightarrow 4(\operatorname{cosec}^2 66^\circ - \tan^2 (90 - 66)^\circ) + \frac{1}{2} (1) - 4 \tan^2 66^\circ y \tan^2 (90 - 66)^\circ = \frac{y}{2}$$

$$\Rightarrow 4(\operatorname{cosec}^2 66^\circ - \cot^2 66^\circ) + \frac{1}{2} - 4 \tan^2 66^\circ y \cot^2 66^\circ = \frac{y}{2}$$

$$\Rightarrow 4(1) + \frac{1}{2} - 4y = \frac{y}{2}$$

$$\Rightarrow \frac{y}{2} + 4y = \frac{9}{2}$$

$$\Rightarrow \frac{9y}{2} = \frac{9}{2}$$

$$\Rightarrow y = 1$$

Hence, the correct answer is Option D

Question 68

Chords AB and CD of a circle intersect externally at P. If AB = 6 cm, CD = 3 cm and PB = 4 cm, then the length (in cm) of PD is:

A 5

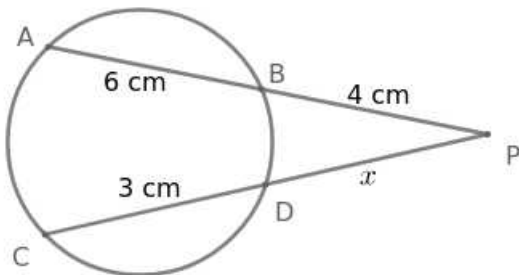
B 7

C 6

D 2

Answer: A

Explanation:



Given,

AB = 6 cm, CD = 3 cm and PB = 4 cm

Let PD = x cm

If chords AB and CD of a circle intersect externally at P then $PA \times PB = PC \times PD$

$$\Rightarrow (AB + PB) \times PB = (CD + PD) \times PD$$

$$\Rightarrow (6 + 4) \times 4 = (3 + x) \times x$$

$$\Rightarrow 40 = 3x + x^2$$

$$\Rightarrow x^2 + 3x - 40 = 0$$

$$\Rightarrow x^2 + 8x - 5x - 40 = 0$$

$$\Rightarrow x(x + 8) - 5(x + 8) = 0$$

$$\Rightarrow (x + 8)(x - 5) = 0$$

$$\Rightarrow x + 8 = 0 \text{ or } x - 5 = 0$$

$$\Rightarrow x = -8 \text{ or } x = 5$$

x cannot be negative

$$\Rightarrow x = 5$$

\therefore PD = $x = 5$ cm

Hence, the correct answer is Option A

Question 69

The value of $1\frac{1}{8} \div \left\{ \frac{3\frac{1}{5} + \frac{3}{5}}{5} \div \frac{8}{5} + \left(\frac{1}{8} \div \frac{1}{3} \right) \right\}$ is:

- A $\frac{19}{9}$
- B $\frac{19}{16}$
- C $\frac{19}{64}$
- D $\frac{19}{7}$

Answer: A

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Question 70

If each side of a rectangle is increased by 13%, then its area will increase by:

- A 27.69%
- B 13%
- C 26%
- D 21.69%

Answer: A

Explanation:

Let the length of the rectangle = l

Breadth of the rectangle = b

Area of the rectangle = lb

Length of the rectangle when increased by 13% = $\frac{113}{100}l$

Breadth of the rectangle when increased by 13% = $\frac{113}{100}b$

New area of the rectangle = $\frac{113}{100}l \times \frac{113}{100}b = \frac{12769}{10000}lb$

\therefore Percentage increase in area = $\frac{\frac{12769}{10000}lb - lb}{lb} \times 100 = \frac{2769}{10000} \times 100 = 27.69\%$

Hence, the correct answer is Option A

Question 71

If $(x - 7)^3 + (2x + 8)^3 + (2x - 3)^3 = 3(x - 7)(2x + 8)(2x - 3)$, then what is the value of x ?

- A 1.6
- B 0.4
- C 2.4
- D 1.2

Answer: B

Explanation:

$$\text{Given, } (x-7)^3 + (2x+8)^3 + (2x-3)^3 = 3(x-7)(2x+8)(2x-3)$$

$$\Rightarrow (x-7)^3 + (2x+8)^3 + (2x-3)^3 - 3(x-7)(2x+8)(2x-3) = 0$$

We know that if $a^3 + b^3 + c^3 - 3abc = 0$ then $a + b + c = 0$

$$\Rightarrow (x-7) + (2x+8) + (2x-3) = 0$$

$$\Rightarrow 5x - 2 = 0$$

$$\Rightarrow x = \frac{2}{5}$$

$$\Rightarrow x = 0.4$$

Hence, the correct option is Option B

Question 72

If $\sin \theta = 3x$ and $\cos \theta = \frac{3}{x}$, ($x \neq 0$) then the value of $6 \left(x^2 + \frac{1}{x^2}\right)$ is:

A $\frac{1}{3}$

B $\frac{2}{3}$

C $\frac{1}{4}$

D $\frac{1}{2}$

Answer: B

Explanation:

$$\text{Given, } \sin \theta = 3x \text{ and } \cos \theta = \frac{3}{x}$$

We know that, $\sin^2 \theta + \cos^2 \theta = 1$

$$\Rightarrow (3x)^2 + \left(\frac{3}{x}\right)^2 = 1$$

$$\Rightarrow 9x^2 + \frac{9}{x^2} = 1$$

$$\Rightarrow 9 \left(x^2 + \frac{1}{x^2}\right) = 1$$

$$\Rightarrow x^2 + \frac{1}{x^2} = \frac{1}{9}$$

$$\Rightarrow 6 \left(x^2 + \frac{1}{x^2}\right) = \frac{6}{9}$$

$$\Rightarrow 6 \left(x^2 + \frac{1}{x^2}\right) = \frac{2}{3}$$

Hence, the correct answer is Option B

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Question 73

If $x = 2 + \sqrt{3}$, then the value of $x^3 - x^{-3}$ is:

A 52

B -52

C $30\sqrt{3}$

D $-30\sqrt{3}$

Answer: C

Explanation:

Given, $x = 2 + \sqrt{3}$

$$\Rightarrow \frac{1}{x} = \frac{1}{2 + \sqrt{3}}$$

$$\Rightarrow \frac{1}{x} = \frac{1}{2 + \sqrt{3}} \times \frac{2 - \sqrt{3}}{2 - \sqrt{3}}$$

$$\Rightarrow \frac{1}{x} = \frac{2 - \sqrt{3}}{4 - 3}$$

$$\Rightarrow \frac{1}{x} = 2 - \sqrt{3}$$

$$\therefore x - \frac{1}{x} = (2 + \sqrt{3}) - (2 - \sqrt{3}) = 2\sqrt{3}$$

$$\Rightarrow \left(x - \frac{1}{x}\right)^3 = (2\sqrt{3})^3$$

$$\Rightarrow x^3 - \frac{1}{x^3} - 3 \cdot x \cdot \frac{1}{x} \left(x - \frac{1}{x}\right) = 8(3\sqrt{3})$$

$$\Rightarrow x^3 - \frac{1}{x^3} - 3(2\sqrt{3}) = 24\sqrt{3}$$

$$\Rightarrow x^3 - x^{-3} = 30\sqrt{3}$$

Hence, the correct answer is Option C

Question 74

Two students, A and B, appeared for an examination. A secured 8 marks more than B and the marks of the former was 60% of the sum of their marks. The sum of the marks obtained by A and B is:

- A 75
- B 45
- C 40
- D 50

Answer: C

Explanation:

given that marks scored by A = 8+B

also given that former has scored 60% of total score

$$A = 60/100(A+B)$$

$$\text{But } A = 8+B$$

$$\text{so } A = 60/100(8+B+B)$$

$$A + 60/100(8+2B)$$

$$10A = 48 + 12B$$

$$\text{but } B = A - 8$$

$$10A = 48 + 12(A - 8)$$

$$10A = 48 + 12A - 96$$

$$2A = 48$$

$$A = 24$$

we know that $A = 8 + B$

$$B = 24 - 8 = 16$$

sum of the marks obtained by A and B is $24 + 16 = 40$

hence answer is C

Question 75

The distance between the centre of two circles of radius 4 cm and 2 cm is 10 cm. The length (in cm) of a transverse common tangent is:

- A 4
- B 6
- C 10
- D 8

Answer: D

Explanation:

Given, distance between centres of circles (d) = 10 cm

Radius of first circle (r_1) = 4 cm

Radius of second circle (r_2) = 2 cm

\therefore The length of transverse common tangent = $\sqrt{d^2 - (r_1 + r_2)^2} = \sqrt{10^2 - (4 + 2)^2} = \sqrt{100 - 36} = 8 \text{ cm}$

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English

Instructions

For the following questions answer them individually

Question 76

Select the most appropriate word for the group of words.
That which cannot be seen through

- A magical
- B opaque
- C transparent
- D invisible

Answer: B

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Question 77

Given below are four jumbled sentences. Out of the given options pick the one that gives their correct order.

- A. As a result, he had gotten into a million activities and hobbies.
- B. Thus, his parents were now reluctant to spend any more money on his hobbies.
- C. John hated finishing things almost as much as he loved starting them.
- D. But he never stuck with any of them for long.

- A ADCB
- B BCAD
- C CADB

D CDBA

Answer: C

Question 78

Select the correctly spelt word.

A persoue

B pursue

C persue

D purseue

Answer: B

Instructions

Identify the most appropriate option to substitute the underlined segment. If no substitution is required, select No substitution.

Question 79

The commander of the ship as well as the crew are caught by the storm.

A No substitution

B are being caught by

C is caught in

D are caught in

Answer: C

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Question 80

All the accident victims have been admitted and received attention.

A but are receiving

B No substitution

C so had received

D and have received

Answer: D

Instructions

For the following questions answer them individually

Question 81

Select the most appropriate synonym of the given word.

VITAL

A needless

B essential

C insignificant

D trivial

Answer: B

Question 82

Select the most appropriate indirect form of the given sentence.
She says, "I go for a walk every morning."

A She says that she goes for a walk every morning.

B She said that she goes for a walk every morning.

C She said that she went for a walk every morning.

D She says that I go for a walk every morning.

Answer: A

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Question 83

Select the most appropriate passive form of the given sentence.
He threw the ball towards his little brother.

A The ball was thrown towards his little brother.

B The ball is thrown towards his little brother.

C His little brother's ball was thrown at him.

D The ball is being thrown towards his little brother.

Answer: A

Question 84

Select the most appropriate word for the group of words.
Willing to be guided or controlled

A abominable

B adorable

C amenable

D adamant

Answer: C

Question 85

Identify the segment which contains the grammatical error.
The picture of the king's is exactly like the king himself.

A The picture

B the king himself

C is exactly like

D of the king's

Answer: D

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Question 86

Fill in the blank with the most appropriate word.

_____ people are remembered even after death for their good deeds.

A Virtuous

B Vicious

C Violent

D Virtual

Answer: A

Question 87

Select the most appropriate antonym of the given word.

OMINOUS

A threatening

B baleful

C foreboding

D auspicious

Answer: D

Question 88

Select the most appropriate meaning of the given idiom.

Red letter day

A a very hot day

B a very cold day

C a very special day

D a frightful day

Answer: C

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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:

For two months I have been trying to decide who (1) _____ the best ice cream. I have (2) _____ it down to my two favourite

manufacturers. Let's start (3) _____ Randolph Farms who have lots of (4) _____ flavours. Then, we have Goodies who use natural (5) _____ to make excellent ice cream.

Question 89

Select the most appropriate option to fill in blank number 1

- A was making
- B is making
- C makes
- D make

Answer: C

Question 90

Select the most appropriate option to fill in blank number 2

- A chosen
- B cancelled
- C narrowed
- D selected

Answer: C

Question 91

Select the most appropriate option to fill in blank number 3

- A by
- B with
- C from
- D off

Answer: B

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Question 92

Select the most appropriate option to fill in blank number 4

- A unlike
- B variety
- C various
- D different

Answer: D

Question 93

Select the most appropriate option to fill in blank number 5

- A goods
- B ingredients
- C elements
- D particles

Answer: B

Instructions

For the following questions answer them individually

Question 94

Select the most appropriate meaning of the given idiom.

In a pickle

- A in great pain
- B in deep sorrow
- C in jubilation
- D in trouble

Answer: D

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Question 95

Select the most appropriate antonym of the given word.

NOVEL

- A old
- B original
- C new
- D fresh

Answer: A

Question 96

Identify the segment which contains the grammatical error.

He asked from me if I was interested in a career in modelling.

- A He asked
- B from me if
- C I was interested
- D in a career

Answer: B

Question 97

Select the most appropriate synonym of the given word.

PITFALL

- A hazard
- B refuge
- C retreat
- D haven

Answer: A

Question 98

Select the wrongly spelt word.

- A receive
- B acheive
- C grieve
- D believe

Answer: B

Question 99

Given below are four jumbled sentences. Out of the given options pick the one that gives their correct order.

- A. We even fail to recognize that their call of duty keeps them away from their families.
- B. Yet, we often fail to appreciate these sacrifices that they make.
- C. They make countless sacrifices for the nation and keep us safe from our enemies.
- D. The uniformed men and women are our unsung heroes.

- A DABC
- B DCBA
- C ABCD
- D CBAD

Answer: B

Question 100

Fill in the blank with the most appropriate word.

She was _____ with joy at winning the talent show.

- A overruled
- B overwhelmed
- C overturned

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D overpowered

Answer: B

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