



2016 SSC CGL 10 Sep Evening Shift

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Reasoning

Instructions

For the following questions answer them individually

Question 1

Select the related word/letters/numbers from the given alternatives:

Line : Square :: Arc : ?

- A Ring
- B Sphere
- C Circle
- D Ball

Answer: C

Explanation:

Square is formed by combination of lines, similarly a circle is formed by arcs.

=> Ans - (C)

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Question 2

Select the related word/letters/numbers from the given alternatives:

FJSP : DLQR :: GMIL : ?

- A EOGN
- B JNIO
- C HOGN
- D IONG

Answer: A

Explanation:

Expression = FJSP : DLQR :: GMIL : ?

The pattern followed is :

F	J	S	P
(-2)	(+2)	(-2)	(+2)
D	L	Q	R

Similarly, for GMIL :

G	M	I	L
(-2)	(+2)	(-2)	(+2)
E	O	G	N

=> Ans - (A)

Question 3

Select the related word/letters/numbers from the given alternatives:

21 : 3 :: 574 : ?

- A 23

- B 82
- C 97
- D 113

Answer: B

Explanation:

Expression = $21 : 3 :: 574 : ?$

The pattern followed is = $n : \frac{n}{7}$

Eg = $21 : \frac{21}{7} = 21 : 3$

Similarly, $\frac{574}{7} = 82$

=> Ans - (B)

Question 4

For the following questions

Find the odd word/letters/number from the given alternatives.

- A Tabla
- B Tanpura
- C Sarod
- D Sitar

Answer: A

Explanation:

Tanpura, Sarod and Sitar are all string instrument, hence tabla is the odd one out.

=> Ans - (A)

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Question 5

For the following questions

Find the odd word/letters/number from the given alternatives.

- A CBED
- B JILK
- C TSVU
- D VZXY

Answer: D

Explanation:

(A) : C (-1 letter) = B (+3 letters) = E (-1 letter) = D

(B) : J (-1 letter) = I (+3 letters) = L (-1 letter) = K

(C) : T (-1 letter) = S (+3 letters) = V (-1 letter) = U

(D) : V (+4 letters) = Z (-2 letters) = X (+1 letter) = Y

=> Ans - (D)

Question 6

For the following questions

Find the odd word/letters/number from the given alternatives.

- A** 132
- B** 176
- C** 279
- D** 352

Answer: C

Explanation:

Except 279, all given numbers are even numbers, hence it is the odd one out.

=> Ans - (C)

Question 7

Arrange the following words as per order in the dictionary

- 1. Sinister**
- 2. Sinuous**
- 3. Sinhalese**
- 4. Sinusitis**
- 5. Sinecure**

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

Answer: D

Explanation:

As per the dictionary,

= Sinecure -> Sinhalese -> Sinister -> Sinuous -> Sinusitis

≡ 53124

=> Ans - (D)

SSC CGL Tier-2 Previous Papers PDF

Question 8

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

LMA, NOB, PQC, ? , TUE

- A** TUV
- B** RSD
- C** DOA
- D** BRD

Answer: B

Explanation:

Expression : LMA, NOB, PQC, ? , TUE

The pattern followed is that the first two letters of the words are the successive letters of English alphabetical series and the third letter consists of consecutive letters starting from 'A'

1st and 2nd letters : LM , NO , PQ , RS , TU

3rd letter : A , B , C , D , E

Thus, missing word = **RSD**

=> Ans - (B)

Question 9

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

41, 43, 47, 53, ?

A 59

B 63

C 61

D 65

Answer: C

Explanation:

Consecutive even numbers are added.

$$41 + 2 = 43$$

$$43 + 4 = 47$$

$$47 + 6 = 53$$

$$53 + 8 = \mathbf{61}$$

=> Ans - (C)

Question 10

Pointing towards a boy Meera said 'He is the son of the only son of my grandfather.' How is that boy related to Meera?

A Cousin

B Brother

C Uncle

D Brother-in-law

Answer: B

Explanation:

Only son of Meera's grandfather = Meera's father

Now, that boy is son of Meera's father, => Meera and the boy are siblings.

Thus, the boy is Meera's brother.

=> Ans - (B)

Question 11

In a row of 15 children, when Raju was shifted three places towards right, he became 8th from the right end. What was his earlier position from the left end of the row?

- A 14
- B 12
- C 6
- D 5

Answer: D

Explanation:

Total children in the row = 15

Raju's final position from right end = 8th

=> Raju's initial position from right end = $8+3 = 11$ th

∴ His earlier position from left end = $(15-11)+1 = 5$ th

=> Ans - (D)

Question 12

From the given alternative words, select the word which cannot be formed using the letters of the given word:

PREDICAMENT

- A CEMENT
- B DEMENTIA
- C PREDICT
- D PRIMER

Answer: D

Explanation:

The word PREDICAMENT does not contain 2 'R', thus the word 'Primer' cannot be formed.

=> Ans - (D)

Question 13

In a certain code, 'TEACHER' is written as VGCEJGT. How is 'CHILDREN' written in that code?

- A EJKNEGTP
- B EJKNFTGP
- C EJNFITP
- D EJKNFTGH

Answer: B

Explanation:

'TEACHER' is written as VGCEJGT

The pattern followed is :

T	E	A	C	H	E	R
(+2)	(+2)	(+2)	(+2)	(+2)	(+2)	(+2)
V	G	C	E	J	G	T

Similarly, for CHILDREN :

C	H	I	L	D	R	E	N
(+2)	(+2)	(+2)	(+2)	(+2)	(+2)	(+2)	(+2)
E	J	K	N	F	T	G	P

=> Ans - (B)

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Question 14

If L denotes 'x', M denotes '÷', P denotes '+' and Q denotes '-', then
16P24M8Q6M2L3

- A 13/6
- B -1/6
- C 14½
- D 10

Answer: D

Explanation:

Expression : 16 P 24 M 8 Q 6 M 2 L 3

$$\equiv 16 + 24 \div 8 - 6 \div 2 \times 3$$

$$= 16 + 3 - 9 = 10$$

=> Ans - (D)

Question 15

The missing number in the given series is:

15 (105) 14 , 13 (?) 12

- A 91
- B 78
- C 65
- D 68

Answer: B

Explanation:

The pattern followed is that the number in the middle is obtained by multiplying the other two numbers and dividing the result by 2.

$$\text{Eg : } \frac{15 \times 14}{2} = 105$$

$$\text{Similarly, } \frac{13 \times 12}{2} = 13 \times 6 = 78$$

=> Ans - (B)

Question 16

Select the missing numbers from the given alternatives

?	120	150
110	100	90
80	60	40

- A 60
- B 70
- C 80
- D 90

Answer: D

Explanation:

In each row, the number in the middle is the arithmetic mean of the other two.

$$\text{Eg} = \frac{110+90}{2} = \frac{200}{2} = 100$$

$$\text{and } \frac{80+40}{2} = \frac{120}{2} = 60$$

$$\text{Similarly, } \frac{150+x}{2} = 120$$

$$\Rightarrow 150 + x = 240$$

$$\Rightarrow x = 240 - 150 = 90$$

$$\Rightarrow \text{Ans} - (D)$$

General Science Notes for SSC CGL

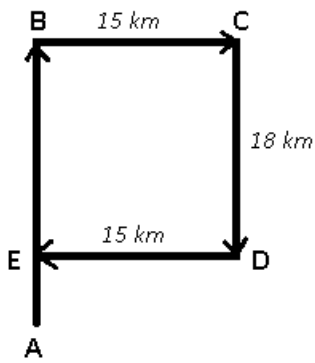
Question 17

Prabhu travelled from his house a distance of 20kms to his friend's house. After some time he left his friend's house and took a turn towards right and travelled 15 kms to reach a park. After resting for a while, he again started and turned to right and travelled 18 kms to reach a petrol bunk. From there he again turned right and covered a distance of 15 kms. How many km more he has to travel to reach home?

- A 2 kms
- B 18 kms
- C 21 kms
- D 23 kms

Answer: A

Explanation:



Let Prabhu started from point A and travelled 20 km to reach his friend's house at B, then he turned right and travelled for 15 km to reach C. Then, he travelled to the petrol bunk towards south for 18 km and finally stopped at point E.

Distance he needs to travel to reach home = $AE = 20 - 18 = 2$ km

=> Ans - (A)

Question 18

Consider the given statement/s to be true and decide which of the given conclusions/assumptions can definitely be drawn from the given statement.

Statements:

Some flies are ants.

All insects are ants.

Conclusions:

I. All flies are ants.

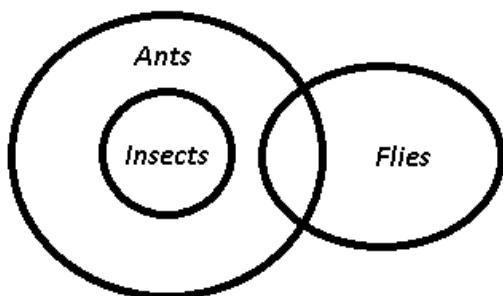
II. Some ants are insects.

- A Only conclusion I follows
- B Only conclusion II follows
- C Both conclusion I and conclusion II follow
- D Neither conclusion I nor conclusion II follows

Answer: B

Explanation:

The venn diagram for the above statements is :

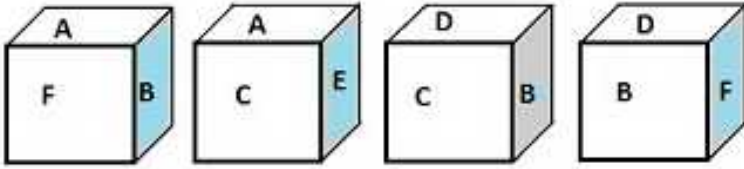


- I. All flies are ants = false
 - II. Some ants are insects = true
- Thus, only conclusion II follows.

=> Ans - (B)

Question 19

From the positions of a cube shown below, which letter will be on the face opposite to face with 'A'?



- A F
- B D
- C C
- D B

Answer: B

Explanation:

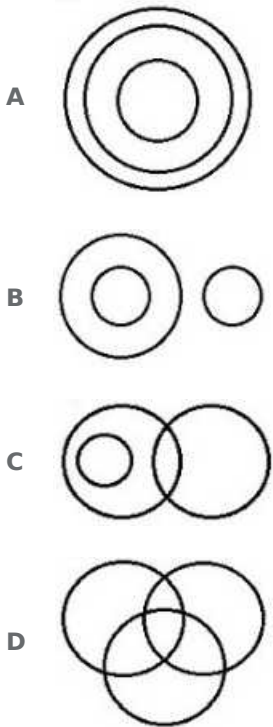
From the first and second figure, it is evident that 'B,C,E,F' are all adjacent to A, thus the only side left, i.e. 'D' will face A.

=> Ans - (B)

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Question 20

Which one of the following Venn diagrams best illustrates the three classes Rhombus, Quadrilaterals, Polygons



Answer: A

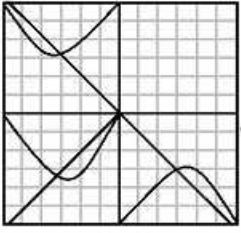
Explanation:

All rhombus are quadrilaterals, and all quadrilaterals are classified as polygons, thus the first figure best describes above relationship.

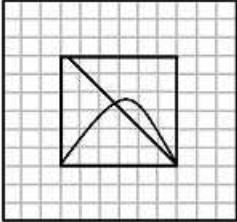
=> Ans - (A)

Question 21

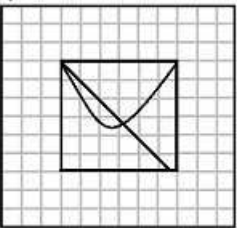
Which answer figure will complete the pattern in the question figure?



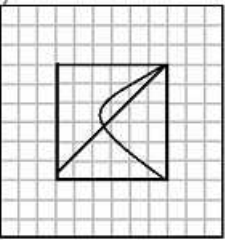
A



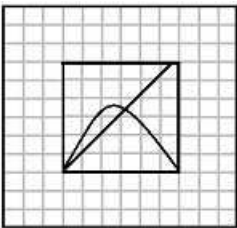
B



C



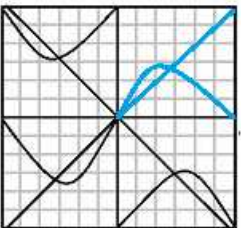
D



Answer: D

Explanation:

When we complete the above figure, we get :

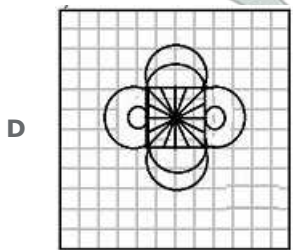
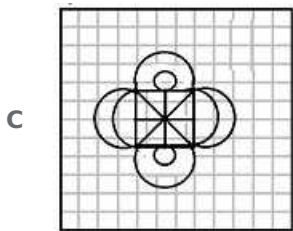
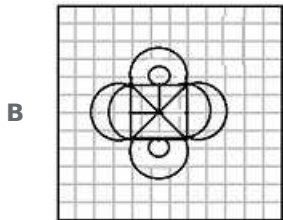
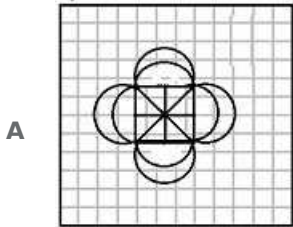
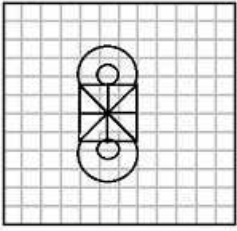


Now, the last figure resembles the above missing part in blue colour.

=> Ans - (D)

Question 22

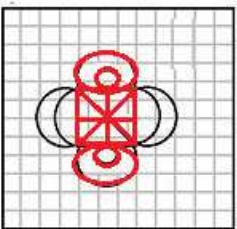
From the given answer figures, select the one in which the question figure is hidden/embedded.



Answer: C

Explanation:

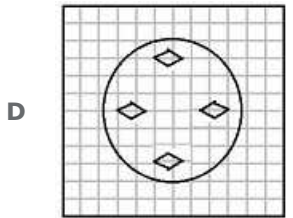
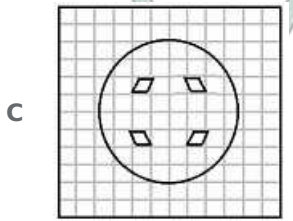
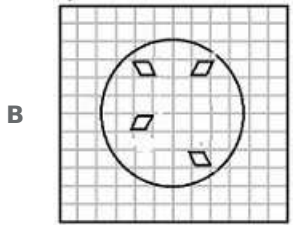
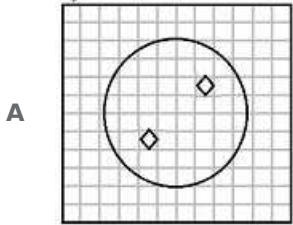
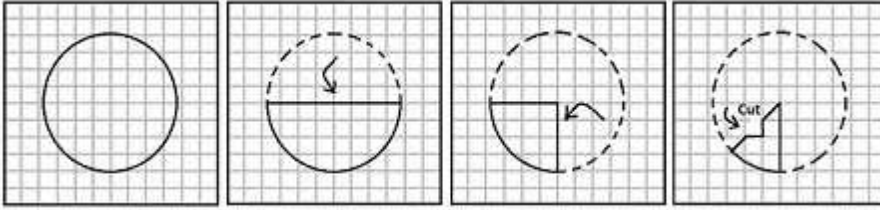
The question figure is embedded in the following figure :



=> Ans - (C)

Question 23

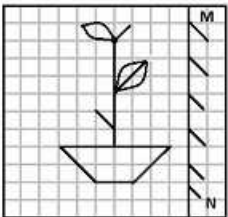
A piece of paper is folded and cut as shown below in the question figures. From the given answer figures, indicate how it will appear when opened.

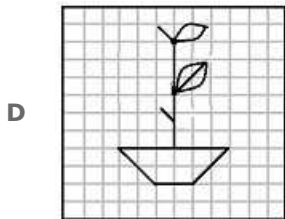
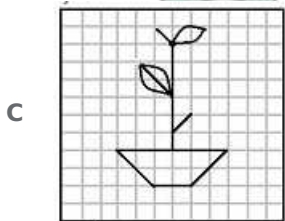
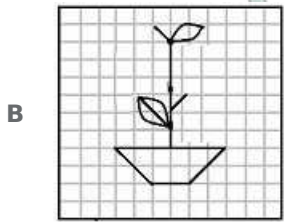
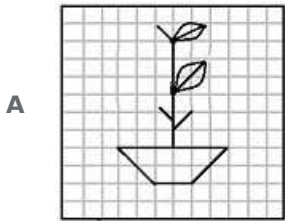


Answer: C

Question 24

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





Answer: C

Explanation:

A vertical mirror is placed, so the object at the left will appear at the right and vice-versa. The two leaves are on the opposite sides, thus they will appear on the opposite sides in the mirror image, and thus the first and last options are eliminated.

Also, the line under the second leaf will appear on the right side and will remain under it, thus second option is invalid.

=> Ans - (C)

Question 25

In the question, 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 in two matrices given below. 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, e.g., 'C' can be represented by 04, 40, etc., and 'K' can be represented by 56, 75, etc. Similarly you have to identify the set for the word 'NICE'

Matrix - I

	0	1	2	3	4
0	C	D	E	F	G
1	E	G	C	D	E
2	D	E	F	G	C
3	E	F	G	C	D
4	G	C	D	E	F

Matrix - II

	5	6	7	8	9
5	H	K	L	I	N
6	I	N	H	K	L
7	K	L	I	N	H
8	L	I	N	H	K
9	N	H	K	L	I

A 66, 58, 33, 02

B 87, 65, 03, 24

C 66, 23, 68, 30

D 59, 68, 40, 02

Answer: A

Explanation:

(A) : 66, 58, 33, 02 = NICE

(B) : 87, 65, 03, 24 = NIFC

(C) : 66, 23, 68, 30 = NGKE

(D) : 59, 68, 40, 02 = NKGE

=> Ans - (A)

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General Awareness

Instructions

For the following questions answer them individually

Question 26

Bilateral monopoly situation is

- A** when there are only two sellers of a product
- B** when there are only two buyers of a product
- C** when there is only one buyer and one seller of a product
- D** when there are two buyers and two sellers of a product

Answer: C

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Question 27

What does the Lorenz curve deal with?

- A** Inflation
- B** Unemployment
- C** Income distribution
- D** Poverty

Answer: C

Question 28

The Preventive Detention Act curtailed

- A** Right to Freedom
- B** Right to Equality
- C** Right to Property

D Education Right

Answer: A

Question 29

Ornithophily is effected by

A snails

B bats

C insects

D birds

Answer: D

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Question 30

To which ganarajya Gautam Buddha belonged?

A Shibi

B Shakya

C Saurasena

D Shabara

Answer: B

Question 31

Which of the following is not an Igneous Rock?

A Dolomite

B Granite

C Basalt

D Gabbro

Answer: A

Question 32

Which of the following vitamins help in the absorption of calcium?

A Vitamin A

B Vitamin D

C Vitamin B

D Vitamin C

Answer: B

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Question 33

The outermost layer of sun is called

- A Lithosphere
- B Chromosphere
- C Photosphere
- D Corona

Answer: B

Question 34

Constantly running system - program processes are known as

- A Daemons
- B Processes
- C Process Block
- D Process Control Block

Answer: A

Question 35

Which of the following vitamins contain nitrogen?

- A Vitamin A
- B Vitamin B
- C Vitamin C
- D Vitamin D

Answer: B

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Question 36

Science dealing with study of soil is called

- A Pedology
- B Pedagogy
- C Ecology
- D Pomology

Answer: A

Question 37

With which sport is P.V. Sindhu associated?

- A** Shooting
- B** Boxing
- C** Swimming
- D** Badminton

Answer: D

Question 38

In hydel power station, the motion produced in turbines is due to

- A** flow of water
- B** burning of coal
- C** burning of diesel
- D** production of steam

Answer: A

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Question 39

Which of the following gases is known as "Laughing Gas"?

- A** Nitrous oxide
- B** Nitrogen peroxide
- C** Nitrogen
- D** Nitric oxide

Answer: A

Question 40

The 'solid waste' is also known as

- A** Sedge
- B** Toxic waste
- C** Sludge
- D** Scrubber

Answer: C

Question 41

If waste materials contaminate the source of drinking water, which of the following diseases will spread?

- A Scurvy
- B Typhoid
- C Malaria
- D Anaemia

Answer: B

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Question 42

Kalamkari painting refers to

- A A hand painted cotton textile in South-India
- B A handmade drawing on bamboo handicrafts in North-East India
- C A block painted woollen cloth in Western Himalayan region of India
- D A hand painted decorative silk cloth in North-Western India

Answer: A

Question 43

Which of the following areas make the largest contribution to national income in India?

- A Industry
- B Services
- C Agriculture
- D Mining

Answer: B

Question 44

Chachnama records the history of which conquest?

- A Kushanas
- B Hunas
- C Arabs
- D Greeks

Answer: C

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Question 45

The deepest trench of the Indian Ocean is

- A Java trench
- B Aleutian trench
- C Atacama trench
- D Tizard trench

Answer: A

Question 46

"Abhinav Bharat" was founded in 1904 as a secret society of revolutionaries by :

- A Damodar Chapekar
- B V. D. Savarkar
- C Praffula Chaki
- D Khudiram Bose

Answer: B

Question 47

Ideas of welfare state are contained in

- A Fundamental Rights
- B Directive Principles of State Policy
- C Preamble of the Constitution
- D Part VII

Answer: B

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Question 48

Which of the following is called the 'Land of the Golden Pagoda'?

- A Myanmar
- B China
- C Japan
- D North Korea

Answer: A

Question 49

Which Indian author in May 2016 won the prestigious 2016 Scholastic Asian Book Award for her work 'Codex : The Lost Treasure of the Indus' ?

- A Anita Desai

- B Aditi Krishna Kumar
- C Rupa Iyer
- D Preethi Nair

Answer: B

Question 50

Pneumonia is a bacterial disease caused by the type of bacteria called _____

- A Bacilli
- B Cocci
- C Sprilli
- D Vibrio

Answer: B

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Mathematics

Instructions

For the following questions answer them individually

Question 51

A and B undertake a piece of work for Rs. 250 . A alone can do that work in 5 days and B alone can do that work in 15 days . With the help of C, they finish the work in 3 days . If every one gets paid in proportion to work done by them, the amount C will get is

- A Rs.50
- B Rs.100
- C Rs.150
- D Rs.200

Answer: A

Explanation:

Let total work to be done = 15 units

A alone can do the work in 5 days, => A's efficiency = $\frac{15}{5} = 3$ units/day

Similarly, B's efficiency = $\frac{15}{15} = 1$ unit/day

Let C's efficiency = x units/day

=> (A+B+C)'s 1 day's work = $3 + 1 + x = (4 + x)$ units/day

All the three finish the work in 3 days

$$\Rightarrow 3 \times (4 + x) = 15$$

$$\Rightarrow 4 + x = \frac{15}{3} = 5$$

$$\Rightarrow x = 5 - 4 = 1$$

Thus, ratio of efficiency of A : B : C = 3 : 1 : 1

Total amount = Rs. 250

∴ Amount C will get = $(3+1+1) \times 250$

= $\frac{250}{5} = \text{Rs. } 50$

⇒ Ans - (A)

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Question 52

Dealer purchased an article for Rs. 900 and fixes the list price in such a way that he gains 20% after allowing 10% discount, then the list price is

A Rs.1180

B Rs.1080

C Rs.1200

D Rs.1100

Answer: C

Explanation:

Let the list price = Rs. $100x$

Discount % = 10 %

⇒ Selling price = $100x \times \frac{90}{100} = \text{Rs. } 90x$ -----(i)

Cost price = Rs. 900

Profit % = 20 %

⇒ Selling price = $900 \times \frac{120}{100} = \text{Rs. } 1080$ -----(ii)

From (i) and (ii), ⇒ $90x = 1080$

⇒ $x = \frac{1080}{90} = 12$

∴ List price = $100 \times 12 = \text{Rs. } 1200$

⇒ Ans - (C)

Question 53

Cost price of 28 articles is equal to Sale price of 21 articles, then percentage of profit is

A 12%

B $33\frac{1}{3}$ %

C 20%

D 22%

Answer: B

Explanation:

Let C.P. of 1 article = Rs. x and S.P. = Rs. y

⇒ C.P. of 28 articles = S.P. of 21 articles

⇒ $28x = 21y$

⇒ $4x = 3y$

$$\Rightarrow \frac{y}{x} = \frac{4}{3}$$

Let $y = 4$ and $x = 3$

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

$$= \frac{4-3}{3} \times 100$$

$$= \frac{100}{3} = 33\frac{1}{3}\%$$

\Rightarrow Ans - (B)

Question 54

In the last financial year, a car company sold 41,800 cars . In this year, the target is to sell 51,300 cars . By what percent must the sale be increased ?

A $11\frac{9}{12}\%$

B $8\frac{9}{22}\%$

C $8\frac{11}{23}\%$

D $22\frac{8}{11}\%$

Answer: D

Explanation:

Sales last year = 41,800 cars

Sales required = 51,300 cars

$$\Rightarrow \text{Required \% increase} = \frac{(51300-41800)}{41800} \times 100$$

$$= \frac{9500}{418} = \frac{250}{11}$$

$$= 22\frac{8}{11}\%$$

\Rightarrow Ans - (D)

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Question 55

If the speed of a boat in still water is 20 km/hr and the speed of the current is 5 km/hr, then the time taken by the boat to travel 100 km with the current is

A 2 hrs

B 3 hrs

C 4 hrs

D 7 hrs

Answer: C

Explanation:

Speed of boat = 20 km/hr and speed of current = 5 km/hr

Distance to travel = 100 km

Speed downstream (with the current) = 20 + 5 = 25 km/hr

\Rightarrow Time taken = distance / speed

$$= \frac{100}{25} = 4 \text{ hours}$$

=> Ans - (C)

Question 56

If a sum of money doubles itself in 8 yrs, then the interest rate in percentage is ?

- A 8 ½%
- B 10%
- C 10 ½ %
- D 12 ½ %

Answer: D

Explanation:

Let the sum = Rs. x and rate of interest = $r\%$

=> Amount after 8 years = Rs. $2x$

=> Simple interest = $(2x - x) = \text{Rs. } x$

Also, $SI = \frac{P \times r \times t}{100}$

$$\Rightarrow \frac{x \times r \times 8}{100} = x$$

$$\Rightarrow r = \frac{100}{8} = 12\frac{1}{2}\%$$

=> Ans - (D)

Question 57

If $(x - 5)^2 + (y - 2)^2 + (z - 9)^2 = 0$, then value of $(x + y - z)$ is

- A 16
- B -1
- C -2
- D 12

Answer: C

Explanation:

Expression : $(x - 5)^2 + (y - 2)^2 + (z - 9)^2 = 0$

∵ If sum of three positive numbers is zero, then the numbers are equal to zero

$$\Rightarrow (x - 5)^2 = 0$$

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

$$\Rightarrow x = 5$$

Similarly, $y = 2$ and $z = 9$

To find : $(x + y - z)$

$$= 5 + 2 - 9 = -2$$

=> Ans - (C)

Question 58

If $x + \frac{1}{x} = 3$ then $x^8 + \frac{1}{x^8}$ is equal to

- A 2201
- B 2203
- C 2207
- D 2213

Answer: C

Explanation:

Expression : $x + \frac{1}{x} = 3$

Squaring both sides,

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

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

$$\Rightarrow x^2 + \frac{1}{x^2} = 9 - 2 = 7$$

Squaring both sides, we get :

$$\Rightarrow \left(x^2 + \frac{1}{x^2}\right)^2 = (7)^2$$

$$\Rightarrow x^4 + \frac{1}{x^4} + 2 \cdot x^2 \cdot \frac{1}{x^2} = 49$$

$$\Rightarrow x^4 + \frac{1}{x^4} = 49 - 2 = 47$$

Again squaring both sides,

$$\Rightarrow \left(x^4 + \frac{1}{x^4}\right)^2 = (47)^2$$

$$\Rightarrow x^8 + \frac{1}{x^8} + 2 \cdot x^4 \cdot \frac{1}{x^4} = 2209$$

$$\Rightarrow x^8 + \frac{1}{x^8} = 2209 - 2 = 2207$$

\Rightarrow Ans - (C)

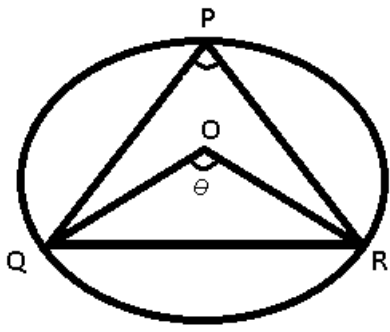
Question 59

Points P , Q and R are on a circle such that $\angle PQR = 40^\circ$ and $\angle QRP = 60^\circ$. Then the subtended angle by arc QR at the centre is

- A 80°
- B 120°
- C 140°
- D 160°

Answer: D

Explanation:



Given : $\angle PQR = 40^\circ$ and $\angle QRP = 60^\circ$

To find : $\angle QOR = \theta = ?$

Solution : In $\triangle PQR$,

$$\Rightarrow \angle PQR + \angle QRP + \angle QPR = 180^\circ$$

$$\Rightarrow 40^\circ + 60^\circ + \angle QPR = 180^\circ$$

$$\Rightarrow \angle QPR = 180^\circ - 100^\circ = 80^\circ$$

Angle subtended by an arc at the centre is double the angle subtended by it at an other point on the circle,

$$\Rightarrow \angle QOR = 2 \times \angle QPR$$

$$\Rightarrow \theta = 2 \times 80^\circ = 160^\circ$$

\Rightarrow Ans - (D)

Question 60

The ratio of the angles of a triangle is 1:2/3:3 then the smallest angle is

A $21\frac{4}{7}^\circ$

B 25°

C $25\frac{5}{7}^\circ$

D $38\frac{4}{7}^\circ$

Answer: C

Explanation:

Let the angles of triangle be x , $\frac{2x}{3}$ and $3x$

Multiplying by 3, \Rightarrow Angles = $3x, 2x, 9x$

Sum of angles = 180°

$$\Rightarrow 3x + 2x + 9x = 180^\circ$$

$$\Rightarrow 14x = 180^\circ$$

$$\Rightarrow x = \frac{180}{14} = \frac{90}{7}$$

\therefore Smallest angle = $2x$

$$= 2 \times \frac{90}{7} = \frac{180}{7}$$

$$= 25\frac{5}{7}^\circ$$

\Rightarrow Ans - (A)

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Question 61

If $\alpha + \beta = 90^\circ$ and $\alpha:\beta = 2:1$, then the ratio of $\cos\alpha$ to $\cos\beta$ is

- A $1:\sqrt{3}$
- B $1:3$
- C $1:\sqrt{2}$
- D $1:2$

Answer: A

Explanation:

Given : $\alpha + \beta = 90^\circ$ and $\alpha:\beta = 2:1$

Let $\alpha = 2x$ and $\beta = x$

$$\Rightarrow 2x + x = 90^\circ$$

$$\Rightarrow x = \frac{90}{3} = 30^\circ$$

$$\Rightarrow \alpha = 60^\circ \text{ and } \beta = 30^\circ$$

$$\therefore \frac{\cos\alpha}{\cos\beta} = \frac{\cos(60^\circ)}{\cos(30^\circ)}$$

$$= \frac{1}{2} = \frac{1}{\sqrt{3}}$$

\Rightarrow Ans - (A)

Question 62

The least number to be added to 13851 to get a number which is divisible by 87 is

- A 18
- B 43
- C 54
- D 69

Answer: D

Explanation:

Factorizing $13851 = 87 \times 159 + 18$

Thus, on dividing 13851 by 87, the remainder is 18

\therefore The number that must be added to 13851 so that the sum obtained is completely divisible by 87

$$= 87 - 18 = 69$$

\Rightarrow Ans - (D)

Question 63

Two numbers are in the ratio 3:5. If 6 is added to both of them, the ratio becomes 2:3. The numbers are

- A 21 and 35
- B 30 and 50
- C 24 and 40

D 18 and 30

Answer: D

Explanation:

Let the numbers are $3x$ and $5x$

According to ques,

$$\Rightarrow \frac{3x+6}{5x+6} = \frac{2}{3}$$

$$\Rightarrow 9x + 18 = 10x + 12$$

$$\Rightarrow 10x - 9x = 18 - 12$$

$$\Rightarrow x = 6$$

\therefore Numbers are = $(3 \times 6), (5 \times 6)$

= 18 and 30

\Rightarrow Ans - (D)

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Question 64

The average weight of 10 parcels is 1.7 kg. Addition of another new parcel reduces the average weight by 60 gram. What is the weight, in kg, of the new parcel?

A 1.04

B 1.08

C 1.4

D 1.8

Answer: A

Explanation:

Let the weight of new parcel = x kg

Average weight of 10 parcels = 1.7 kg

\Rightarrow Total weight of 10 parcels = $1.7 \times 10 = 17$ kg

After adding the new parcel, average weight = $1.7 - 0.06 = 1.64$ kg

$$\Rightarrow \frac{17+x}{11} = 1.64$$

$$\Rightarrow 17 + x = 1.64 \times 11 = 18.04$$

$$\Rightarrow x = 18.04 - 17 = 1.04 \text{ kg}$$

\Rightarrow Ans - (A)

Question 65

If $x=999$, $y=1000$, $z=1001$, then the value of $\frac{x^3+y^3+z^3-3xyz}{x-y+z}$ is

A 1000

B 9000

C 1

D 9

Answer: D

Explanation:

Given : $x=999$ $y=1000$, $z=1001$

Let $y = k$, $\Rightarrow x = (k - 1)$ and $z = (k + 1)$

To find :

$$\frac{x^3+y^3+z^3-3xyz}{x-y+z}$$

$$= \frac{(k-1)^3+(k)^3+(k+1)^3-3[(k-1)(k)(k+1)]}{(k-1)-(k)+(k+1)}$$

$$= \frac{1}{k} \times [(k^3 - 1 - 3k^2 + 3k) + (k^3) + (k^3 + 1 + 3k^2 + 3k) - 3(k^3 - k)]$$

$$= \frac{1}{k} \times [(3k^3 + 6k) + (-3k^3 + 3k)]$$

$$\Rightarrow \frac{9k}{k} = 9$$

\Rightarrow Ans - (D)

Question 66

$\frac{a}{1-2a} + \frac{b}{1-2b} + \frac{c}{1-2c} = \frac{1}{2}$ then the value $\frac{1}{1-2a} + \frac{1}{1-2b} + \frac{1}{1-2c}$ is

- A 1
- B 2
- C 3
- D 4

Answer: D

Explanation:

Expression : $\frac{a}{1-2a} + \frac{b}{1-2b} + \frac{c}{1-2c} = \frac{1}{2}$ -----(i)

Let $\frac{a}{1-2a} = \frac{b}{1-2b} = \frac{c}{1-2c} = k$

Substituting it in equation (i)

$$\Rightarrow k + k + k = 3k = \frac{1}{2}$$

$$\Rightarrow k = \frac{1}{6}$$

Thus, $\frac{a}{1-2a} = \frac{1}{6}$

$$\Rightarrow 6a = 1 - 2a$$
 -----(ii)

$$\Rightarrow 6a + 2a = 8a = 1$$

$$\Rightarrow a = \frac{1}{8}$$

Substituting it in equation (ii), we get :

$$\Rightarrow 1 - 2a = \frac{6}{8} = \frac{3}{4}$$

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

Similarly, $\frac{1}{1-2b} = \frac{1}{1-2c} = \frac{4}{3}$

To find : $\frac{1}{1-2a} + \frac{1}{1-2b} + \frac{1}{1-2c}$

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

\Rightarrow Ans - (D)

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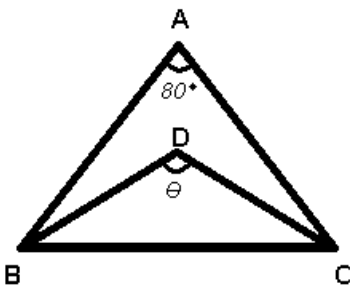
Question 67

In an isosceles triangle $\triangle ABC$, $AB = AC$ and $\angle A = 80^\circ$. The bisector of $\angle B$ and $\angle C$ meet at D. The $\angle BDC$ is equal to

- A 90°
- B 100°
- C 130°
- D 80°

Answer: C

Explanation:



Given : D is the incentre of $\triangle ABC$ and $\angle BAC = 80^\circ$

To find : $\angle BDC = \theta = ?$

Incentre of a triangle = $90^\circ + \frac{\angle A}{2}$

$$\Rightarrow \theta = 90^\circ + \frac{80^\circ}{2}$$

$$\Rightarrow \theta = 90^\circ + 40^\circ$$

$$\Rightarrow \theta = 130^\circ$$

\Rightarrow Ans - (C)

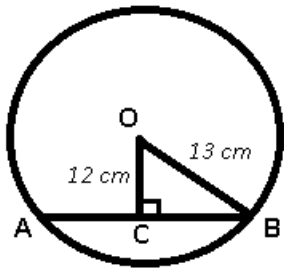
Question 68

The length of a chord which is at a distance of 12 cm from the centre of a circle of radius 13 cm is

- A 10 cm
- B 5 cm
- C 6 cm
- D 12 cm

Answer: A

Explanation:



Given : OB is the radius of circle = 13 cm and OC = 12 cm

To find : AB = ?

Solution : The line from the centre of the circle to the chord bisects it at right angle.

$$\Rightarrow AC = BC = \frac{1}{2} AB$$

In $\triangle OBC$,

$$\Rightarrow (BC)^2 = (OB)^2 - (OC)^2$$

$$\Rightarrow (BC)^2 = (13)^2 - (12)^2$$

$$\Rightarrow (BC)^2 = 169 - 144 = 25$$

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

$$\therefore AB = 2 \times BC$$

$$= 2 \times 5 = 10 \text{ cm}$$

$$\Rightarrow \text{Ans - (A)}$$

Question 69

If θ is positive acute angle and $7\cos^2\theta + 3\sin^2\theta = 4$, then the value of θ is

A 60°

B 30°

C 45°

D 90°

Answer: A

Explanation:

$$\text{Expression : } 7\cos^2\theta + 3\sin^2\theta = 4$$

$$\text{Using, } \sin^2\theta + \cos^2\theta = 1$$

$$\Rightarrow 7\cos^2\theta + 3(1 - \cos^2\theta) = 4$$

$$\Rightarrow 7\cos^2\theta + 3 - 3\cos^2\theta = 4$$

$$\Rightarrow 4\cos^2\theta = 4 - 3 = 1$$

$$\Rightarrow \cos^2\theta = \frac{1}{4}$$

$$\Rightarrow \cos\theta = \sqrt{\frac{1}{4}} = \frac{1}{2}$$

$$\Rightarrow \theta = \cos^{-1}\left(\frac{1}{2}\right)$$

$$\Rightarrow \theta = 60^\circ$$

$$\Rightarrow \text{Ans - (A)}$$

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Question 70

Radius of cross section of a solid right circular cylindrical rod is 3.2 dm. The rod is melted and 44 equal solid cubes of side 8 cm are formed. The length of the rod is (Take $\pi = 22/7$)

- A 56 cm
- B 7 cm
- C 5.6 cm
- D 0.7 cm

Answer: B

Explanation:

Let length of cylindrical rod = h cm and radius = $r = 3.2$ dm = 32 cm

Edge of cube = $a = 8$ cm

Volume of cylindrical rod = $44 \times$ Volume of cube

$$\Rightarrow \pi r^2 h = 44 \times a^3$$

$$\Rightarrow \frac{22}{7} \times (32)^2 h = 44 \times (8)^3$$

$$\Rightarrow (32)^2 h = 44 \times (8)^3 \times \frac{7}{22}$$

$$\Rightarrow h = \frac{14 \times (8)^3}{(32)^2}$$

$$\Rightarrow h = \frac{14}{2} = 7 \text{ cm}$$

\Rightarrow Ans - (B)

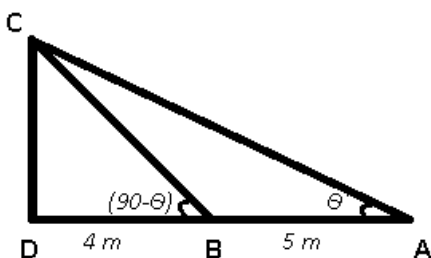
Question 71

The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. The height of the tower is

- A 4 m
- B 7 m
- C 9 m
- D 6 m

Answer: D

Explanation:



Given : CD is the tower, $BD = 4$ m and $AD = 4 + 5 = 9$ m

To find : $CD = h = ?$

Solution : $\angle DBC$ and $\angle DAC$ are complementary

$\Rightarrow \angle DAC = \theta$ and $\angle DBC = (90^\circ - \theta)$

In $\triangle BCD$,

$$\Rightarrow \tan(90^\circ - \theta) = \frac{CD}{DB}$$

$$\Rightarrow \cot(\theta) = \frac{h}{4} \text{ -----(i)}$$

Similarly, in $\triangle ACD$,

$$\Rightarrow \tan(\theta) = \frac{CD}{DA}$$

$$\Rightarrow \tan(\theta) = \frac{h}{9} \text{ -----(ii)}$$

Multiplying equations (i) and (ii), we get :

$$\Rightarrow \tan(\theta)\cot(\theta) = \frac{h}{4} \times \frac{h}{9}$$

$$\Rightarrow 1 = \frac{h^2}{36}$$

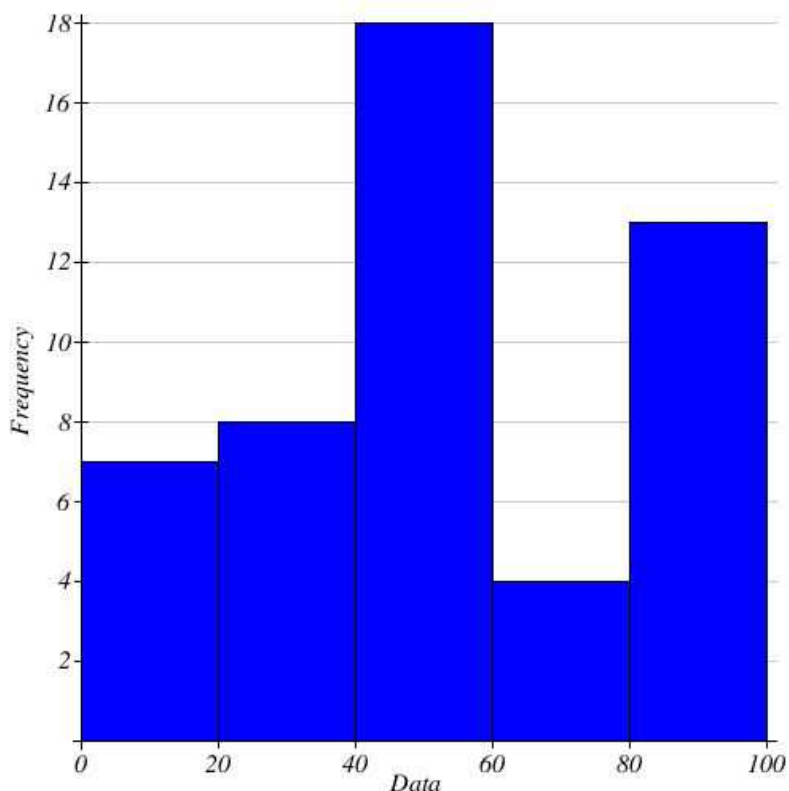
$$\Rightarrow h^2 = 36$$

$$\Rightarrow h = \sqrt{36} = 6 \text{ m}$$

\Rightarrow Ans - (D)

Instructions

Study the histogram of marks (in Mathematics) distribution of 50 students of class IX and answer the following questions.



Question 72

The number of students who have secured marks less than 60 is

A 12

B 15

C 33

D 7

Answer: C

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Question 73

The average marks of the students are

A 53.2

B 45.5

C 60.2

D 55.5

Answer: A

Question 74

The number of students who have scored between 39 and 80 is

A 22

B 18

C 37

D 15

Answer: A

Question 75

Percentage of students who have secured marks more than 59 is

A 13

B 17

C 34

D 26

Answer: C

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English

Instructions

For the following questions answer them individually

Question 76

In the following question, out of the four alternatives, choose the word which best expresses the meaning of the given word and click the button corresponding to it.

EMANCIPATE

- A LIFT
- B RISE
- C RAISE
- D LIBERATE

Answer: D

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Question 77

In the following question, out of the four alternatives, choose the word which is opposite in meaning to the given word and click the button corresponding to it.

TREACHERY

- A BETRAYAL
- B MULING
- C LOYALTY
- D REBELLION

Answer: C

Question 78

Four words are given, out of which only one word is spelt correctly. Choose the correctly spelt word and click the button corresponding to it.

- A Ajournment
- B Adjournmant
- C Ajornment
- D Adjournment

Answer: D

Question 79

In the following questions, one part of the sentence may have an error. Find out which part of the sentence has an error and click the button corresponding to it. If the sentence is free from error, click the "No error" option.

- A A Some of the richest
- B B business magnate
- C C live in Mumbai.
- D D No Error

Answer: B

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Question 80

In the following questions, one part of the sentence may have an error. Find out which part of the sentence has an error and click the button corresponding to it. If the sentence is free from error, click the "No error" option.

- A A This is an urgent
- B B matter which may admit
- C C of few delays.
- D D No error

Answer: C

Question 81

In the following questions, one part of the sentence may have an error. Find out which part of the sentence has an error and click the button corresponding to it. If the sentence is free from error, click the "No error" option.

- A A Outside, the rain beats down
- B B in floods and the sea gives forth
- C C a sound like an alarm bells.
- D D No error

Answer: C

Question 82

The sentences given with blanks are to be filled with an appropriate word(s). Four alternatives are suggested for each question. For each question, choose the correct alternative and click the button corresponding to it.

I hope you know that, once you have signed the contract, you will not be able to _____ .

- A back in
- B back out
- C back up
- D back at

Answer: B

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Question 83

The sentences given with blanks are to be filled with an appropriate word(s). Four alternatives are suggested for each question. For each question, choose the correct alternative and click the button corresponding to it.

Your opening paragraph should _____ the reader's attention.

- A attest
- B address
- C attract
- D affect

Answer: C

Question 84

The sentences given with blanks are to be filled with an appropriate word(s). Four alternatives are suggested for each question. For each question, choose the correct alternative and click the button corresponding to it.

When I visited him last evening we talked the matter _____ .

- A through
- B away
- C off
- D over

Answer: D

Question 85

In each of the questions, four alternatives are given for the Idiom/Phrase. Choose the alternative which best expresses the meaning of the Idiom/Phrase and click the button corresponding to it.

A Man of letters

- A Letter - writer
- B Proof - reader
- C Postman
- D Scholar

Answer: D

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Question 86

In each of the questions, four alternatives are given for the Idiom/Phrase. Choose the alternative which best expresses the meaning of the Idiom/Phrase and click the button corresponding to it.

Under a cloud

- A Shocked
- B Sad
- C Sick
- D Confused

Answer: B

Question 87

In each of the questions, four alternatives are given for the Idiom/Phrase. Choose the alternative which best expresses the meaning of the Idiom/Phrase and click the button corresponding to it.

Bear in mind

- A Respect
- B Observe
- C Remember
- D Pretend to listen

Answer: C

Question 88

Out of the four alternatives, choose the one which can be substituted for the given words/sentences and click the button corresponding to it.

Chief of a group of workmen.

- A Chieftain
- B Engineer
- C Foreman
- D Middleman

Answer: C

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Question 89

Out of the four alternatives, choose the one which can be substituted for the given words/sentences and click the button corresponding to it.

Bitter quarrel between two families existing for a long period.

- A Siege
- B Feud
- C Battle
- D War

Answer: B

Question 90

Out of the four alternatives, choose the one which can be substituted for the given words/sentences and click the button corresponding to it.

Animals without a backbone.

- A Marsupials
- B Mammals
- C Vertebrate

D Invertebrates

Answer: D

Question 91

A sentence/a part of the sentence is underlined. Four alternatives are given to the underlined part which will improve the sentence. Choose the correct alternative and click the button corresponding to it. In case no improvement is needed, click the button corresponding to "No improvement".

Can you be able to please tone down your excitement?

A Can you please be able to tone down your excitement?

B Are you able to please tone down your excitement?

C Can you please tone down your excitement?

D No improvement

Answer: C

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Question 92

A sentence/a part of the sentence is underlined. Four alternatives are given to the underlined part which will improve the sentence. Choose the correct alternative and click the button corresponding to it. In case no improvement is needed, click the button corresponding to "No improvement".

Uneasy lies the head which wears the crown

A who

B that

C what

D No improvement

Answer: B

Question 93

A sentence/a part of the sentence is underlined. Four alternatives are given to the underlined part which will improve the sentence. Choose the correct alternative and click the button corresponding to it. In case no improvement is needed, click the button corresponding to "No improvement".

The cities are bursting on the seams with people.

A bursting on seams

B bursting at seams

C bursting at the seams

D No improvement

Answer: C

Question 94

A sentence/a part of the sentence is underlined. Four alternatives are given to the underlined part which will improve the sentence. Choose the correct alternative and click the button corresponding to it. In case no improvement is needed, click the button corresponding to "No improvement".

Let his failure be a lesson to you all.

- A to all of you
- B to all you people
- C to all you
- D No improvement

Answer: A

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Question 95

A sentence/a part of the sentence is underlined. Four alternatives are given to the underlined part which will improve the sentence. Choose the correct alternative and click the button corresponding to it. In case no improvement is needed, click the button corresponding to "No improvement".

A foolish person is some one who is easily taken-in and tricked by others.

- A sober
- B stupid
- C gullible
- D No improvement

Answer: C

Instructions

A passage is given with 5 questions following it. Read the passage carefully and choose the best answer to each question out of the four alternatives and click the button corresponding to it.

Modern civilisation is completely dependent on energy, which has therefore to be abundant and also economical. About 85% of the world's energy is supplied by oil, coal and natural gas while nuclear, hydro, wind and solar power and biomass supply the rest. Coal, nuclear and hydro are used primarily to generate electricity while natural gas is widely used for heating. Biomass is used both for heating and cooking. The wind and solar power is the future's hope as they are sustainable energy sources. Oil powers almost all machines that move and that makes oil uniquely versatile. Oil powered airplanes carry 500 people across the widest oceans at nearly the speed of sound. Oil powered machines produce and transport food. Oil powered machines are ubiquitous. Clearly, we live in the age of oil but it is drawing to a close. According to data available if oil production remains constant until it's gone, there is enough to last 42 years. Oil wells will produce less as they become depleted, which will make it impossible to keep production constant. Similarly natural gas and coal will last another 61 years and 133 years respectively. Naturally, as they become scarce, they become expensive, leading to a worldwide energy crisis. If we are to survive on this planet, we have to make a transition to sustainable energy sources. The transition may be willy-nilly or planned - the choice is ours. The dawning era of limited and expensive energy will be very difficult for everyone on earth but will be even more difficult if it is not anticipated. It is of utmost importance that the public and policymakers understand the global energy crisis and act in tandem to ensure that the species 'homo sapiens' does not become extinct.

Question 96

The theme of the passage is

- A Changing Lives

- B** Looming Energy Crisis
- C** Energy Resources
- D** Power in Today's world

Answer: B

Question 97

Biomass is an energy source used in

- A** agriculture
- B** industry
- C** homes
- D** offices

Answer: C

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Question 98

The synonym for Ubiquitous is

- A** Omnipotent
- B** Omnifarious
- C** Omniscient
- D** Omnipresent

Answer: D

Question 99

The energy sources of the future are

- A** nuclear and hydro power
- B** coal and natural gas
- C** wind and solar power
- D** oil and biomass

Answer: C

Question 100

The survival of mankind will depend on

- A** maximum use of available energy resources
- B** transition to sustainable energy resources
- C** regulation placed on energy consumers

D keeping the level of energy production constant

Answer: B

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