



SSC CHSL 16 Jan 2017 Afternoon Shift

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Reasoning

Instructions

For the following questions answer them individually

Question 1

Select the related word/letters/number from the given alternatives.

Pacific : Ocean :: Nile : ?

- A Waterfall
- B River
- C Mountain
- D Lake

Answer: B

Explanation:

Expression = Pacific : Ocean :: Nile : ?

Pacific is an ocean, and Nile is a *river*.

=> Ans - (B)

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Question 2

Select the related word/letters/number from the given alternatives.

DEMONSTRATE : NOMEDSETART :: CORRUPT : ?

- A ORCRUPT
- B TPURROC
- C ROCRTPU
- D ROCRUPT

Answer: C

Explanation:

Expression = DEMONSTRATE : NOMEDSETART :: CORRUPT : ?

The pattern followed is :

DEMONSTRATE
↓
NOMEDSETART

Similarly, for CORRUPT :

CORRUPT
↓
ROCRTPU

CORRUPT : ROCRTPU

=> Ans - (C)

Question 3

Select the related word/letters/number from the given alternatives.

MN : NM :: JK : ?

- A RS
- B SR
- C QP
- D PQ

Answer: C

Explanation:

Expression = MN : NM :: JK : ?

Alphabets at the corresponding position from the *reverse* end are written.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
↓	↓	↓	...	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Z	Y	X	W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A

Similarly, JK : **QP**

=> Ans - (C)

Question 4

Select the related word/letters/number from the given alternatives.

85 : 58 :: 64 : ?

- A 42
- B 36
- C 46
- D 26

Answer: C

Explanation:

Expression = 85 : 58 :: 64 : ?

The pattern followed is that second number is reverse of first number.

Thus, reverse of 64 : **46**

=> Ans - (C)

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Question 5

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

- A Lithosphere
- B Hydrosphere
- C Biosphere
- D Mantle

Answer: D

Explanation:

Except Mantle other three are spheres of the earth's ecological system, hence it is the odd one out.

=> Ans - (D)

Question 6

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

A WT

B SR

C ED

D KJ

Answer: A

Explanation:

Except WT, other three are consecutive pair of letters according to the English alphabetical order, hence WT is the odd one out.

=> Ans - (A)

Question 7

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

A 27

B 8

C 64

D 124

Answer: D

Explanation:

$27 = 3^3$, $8 = 2^3$ and $64 = 4^3$, but 124 is not a perfect cube, hence it is the odd one out.

=> Ans - (D)

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Question 8

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

A 5306

B 2147

C 4205

D 4308

Answer: D

Explanation:

The middle digits are the product of first and last digits, but $4 \times 8 \neq 30$, hence 4308 is the odd one out.

=> Ans - (D)

Question 9

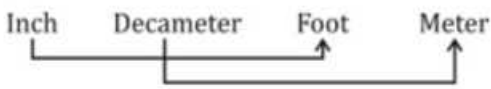
A series is given with one term missing. Choose the correct alternative from the given ones that will complete the series. Inch, Decameter, Foot, ?

- A Decimeter
- B Millimeter
- C Centimeter
- D Meter

Answer: D

Explanation:

The pattern followed is :



Thus, missing term = Meter

=> Ans - (D)

Question 10

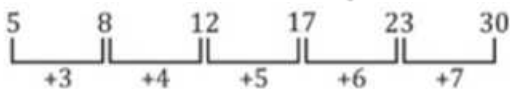
A series is given with one term missing. Choose the correct alternative from the given ones that will complete the series.
5, 8, 12, 17, 23, ?

- A 30
- B 72
- C 65
- D 48

Answer: A

Explanation:

Consecutive integers are added.



Thus, missing number = 30

=> Ans - (A)

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Question 11

In the following question, two statements are given each followed by two conclusions I and II. You have to consider the statements to be true even if they seem to be at variance from commonly known facts. You have to decide which of the given conclusions, if any, follows from the given statements.

Statement:

(I) Some authors are teachers.

(II) No teacher is a lady.

Conclusions:

(I) Some teachers are not ladies.

(II) Some authors are not teachers.

- A Conclusion I follows
- B Conclusion II follows

C Neither I nor II follows

D Both I and II follows

Answer: A

Explanation:

The venn diagram for above statements is :



Conclusions:

(I) Some teachers are not ladies = true

(II) Some authors are not teachers = false

Thus, only conclusion I follows.

=> Ans - (A)

Question 12

A series is given with one term missing. Choose the correct alternative from the given ones that will complete the series. AN, EQ, IT, MW, ?

A QZ

B KX

C IV

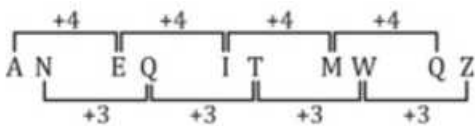
D ZM

Answer: A

Explanation:

Expression : AN, EQ, IT, MW, ?

The pattern followed is :



Thus, missing term = QZ

=> Ans - (A)

Question 13

A series is given with one term missing. Choose the correct alternative from the given ones that will complete the series. PRQ, UWV, ZBA, ? , JLK

A FHG

B EGF

C DFE

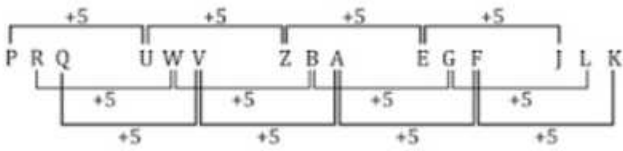
D FGE

Answer: B

Explanation:

Expression : PRQ, UWV, ZBA, ? , JLK

The pattern followed is :



Thus, missing term = EGF

=> Ans - (B)

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Question 14

Chandan is 2 years older than Ankit but 1 year younger than Sumit. Ankit is twice as old as Khushboo. If Khushboo's age is 25 years, what is the age (in years) of Sumit?

- A 51
- B 53
- C 52
- D 55

Answer: B

Explanation:

Khushboo's age = 25 years

=> Ankit's age = $2 \times 25 = 50$ years

=> Chandan's age = $50 + 2 = 52$ years

∴ Sumit's age = $52 + 1 = 53$ years

=> Ans - (B)

Question 15

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

- i. Yielded
- ii. Yelp
- iii. Yeast
- iv. Yogurt

- A ii, iii, iv, i
- B iii, ii, i, iv
- C iv, i, ii, iii
- D i, ii, iii, iv

Answer: B

Explanation:

According to the dictionary,

Yeast -> Yelp -> Yielded -> Yogurt

≡ iii, ii, i, iv

=> Ans - (B)

Question 16

In a certain code language, "MATERIAL" is written as "RIALMATE". How is "REMEMBER" written in that code language?

- A REMERE BM
- B MBEREMER
- C MBERREME
- D MBERREEM

Answer: C

Explanation:

"MATERIAL" is written as "RIALMATE"

The pattern followed is that the word is divided into two parts = (MATE) (RIAL) and both of them replace each other, i.e. = (RIAL) (MATE) to form the code.

Similarly, for REMEMBER = (REME) (MBER), swapping both parts, we get :

REMEMBER : **MBERREME**

=> Ans - (C)

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Question 17

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

5	8	32
9	6	48
7	9	?

- A 45
- B 48
- C 54
- D 64

Answer: C

Explanation:

In each row, for the numbers a, b and c , pattern is : $c = b(a - 1)$

Eg :- $8 \times (5 - 1) = 32$

$6 \times (9 - 1) = 48$

Similarly, $9 \times (7 - 1) = 54$

=> Ans - (C)

Question 18

If "S" denotes "multiplied by", "P" denotes "subtracted from", "R" denotes "added to" and "Q" denotes "divided by", then $14641 \text{ Q } 121 \text{ P } 100 \text{ S } 2 \text{ R } 100 = ?$

- A 48
- B 21
- C 61
- D 31

Answer: B

Explanation:

Expression : $14641 \div 121 - 100 \times 2 + 100 = ?$

$$\equiv 14641 \div 121 - 100 \times 2 + 100$$

$$= \left(\frac{14641}{121} \right) - (100 \times 2) + (100)$$

$$= 121 - 200 + 100 = 21$$

=> Ans - (B)

Question 19

Which set of letters when sequentially placed at the gaps in the given letter series shall complete it?

BC Q AB P R

A PARCQ

B APQRC

C APRCQ

D ACRPR

Answer: C

Explanation:

The pattern followed is that in groups of 3, the terms 'ABC' and 'PQR' are alternatively repeated.

= ABC PQR ABC PQR

=> Ans - (C)

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Question 20

A man is facing towards the east. He turns towards north and walks for 5 km, and then turns 270 degrees anticlockwise and walks for 12 km more. What is the minimum distance between his initial and final position?

A 17 km

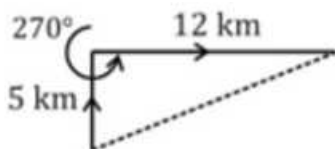
B 13 km

C 11 km

D 9 km

Answer: B

Explanation:



The man initially walked north for 5 km, then turned 270 degrees anticlockwise and walked towards east for 12 km.

Thus, minimum distance between his initial and final position

$$= \sqrt{(5)^2 + (12)^2}$$

$$= \sqrt{25 + 144} = \sqrt{169} = 13 \text{ km}$$

=> Ans - (B)

Question 21

A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as shown in the given two matrices. The columns and rows of Matrix I are numbered from 0 to 4 and that of Matrix II, are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, for example, 'I' can be represented by 21.67 etc. and Tr can be represented by 66. 57 etc. Similarly, you have to identify the set for the word 'GOLF'.

Matrix - I

	0	1	2	3	4
0	Q	R	A	N	B
1	W	I	N	H	L
2	E	N	S	G	O
3	N	Y	G	O	M
4	L	T	O	F	A

Matrix - II

	5	6	7	8	9
5	Z	M	R	I	L
6	O	R	N	W	G
7	C	S	Y	E	U
8	S	N	T	G	S
9	G	B	E	R	U

- A 95, 24, 59, 43
- B 32, 65, 14, 79
- C 88, 33, 40, 14
- D 69, 43, 59, 20

Answer: A

Explanation:

- (A) : 95, 24, 59, 43 = GOLF
 - (B) : 32, 65, 14, 79 = GOLU
 - (C) : 88, 33, 40, 14 = GOLL
 - (D) : 69, 43, 59, 20 = GFLE
- => Ans - (A)

Question 22

Introducing a woman, a boy says, "She is the wife of my grandfather's son". How is the woman related to the boy?

- A Aunt
- B Wife
- C Mother
- D Cannot be determined

Answer: D

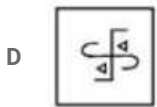
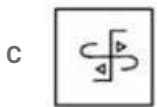
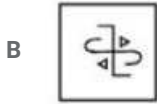
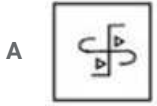
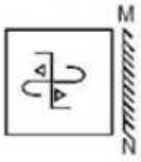
Explanation:

The boy's grandfather's son can be either boy's father or his uncle.
Now, the woman is the wife of either his father or his uncle.
=> The woman can be either his mother or aunt.
Thus, relation cannot be determined.
=> Ans - (D)

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Question 23

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 on the left will appear right in reverse position and vice-versa.

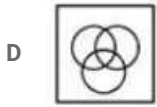
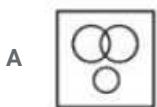
So the triangle at top left (facing left) will now face right at top right position (similar for other triangle), thus the first and last options will be eliminated.

Also, in the question figure, the direction of the two horizontal lines will be changed, hence third option is the right image.

=> Ans - (C)

Question 24

Identify the diagram that best represents the relationship among the given classes. World, India, Delhi



Answer: C

Explanation:

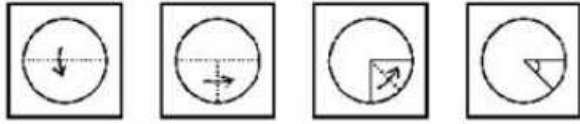
India is part of the world, and Delhi being the capital of India, belongs in India, hence the venn diagram that best describes above relation is :



=> Ans - (C)

Question 25

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



Answer: A

Explanation:

When the paper is unfolded first to the left, similar curve will appear on the left part.

When the paper is unfolded second time to the left, semicircle will appear at the center of the part.

When the paper is unfolded again to the top, a circle will appear at the center of the paper.

∴ When the paper is unfolded it will appear as shown below



Hence, the correct answer is Option A

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General Awareness

Instructions

For the following questions answer them individually

Question 26

Raymond Samuel Tomilson is famous for developing which of the following?

A EMail

B SMS

C Facebook

D Orkut

Answer: A

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Question 27

Sewing machine was invented by

A Alfred P. Southwick

B Isaac Singer

C Murasaki Shikibu

D Hanaoka Seishu

Answer: B

Question 28

Which is the second largest gland of Human body?

A Liver

B Large Intestine

C Thorax

D Pancreas

Answer: D

Question 29

Annona squamosa is the scientific name of

A Custard Apple

B Papaya

C Babhul

D Drumstick

Answer: A

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Question 30

Binomial Nomenclature was founded by

A Charles Darwin

B Robert Nucleus

C Carl Linnaeus

D Lamarck

Answer: C

Question 31

Which among the following is false about acids?

A They give H^+ ions in aqueous solution

B Most acids contain hydrogen

C They turn blue litmus red

D They are bad conductor of electricity in aqueous solution

Answer: D

Question 32

Which among the following is used in making liquors, medicines and as a fuel in aircrafts?

A Propyl alcohol

B Dimethyl alcohol

C Ethyl alcohol

D Methyl alcohol

Answer: C

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Question 33

The famous 'Hawa Mahal' is in which city of Rajasthan?

A Ajmer

B Jodhpur

C Jaipur

D Kota

Answer: C

Question 34

Where is Pushkar Fair held?

A Bihar

B Uttar Pradesh

C Madhya Pradesh

D Rajasthan

Answer: D

Question 35

If a person's income increases from Rs. 10 lakhs per year to Rs. 11 lakhs per year and tax increases from Rs. 80,000 to Rs. 92,500 the marginal tax rate is

- A 12.50%
- B 8%
- C 10%
- D 15%

Answer: A

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Question 36

Which tax is entirely borne by the entity it is levied upon and cannot be passed?

- A Direct tax
- B Indirect tax
- C Straight tax
- D Advance tax

Answer: A

Question 37

Kaziranga National Park is the only natural habitat of the endangered.

- A Snow Leopards
- B OneHorned Rhinos
- C Asiatic Lions
- D Swamp Deer

Answer: B

Question 38

Magnetite is an ore/mineral of

- A Beryllium
- B Chromium
- C Iron
- D Lead

Answer: C

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Question 39

Who directed the movie "The man who knew infinity"?

- A Matthew Brown
- B Christopher Nolan
- C Martin Scorsese
- D Alfred Hitchcock

Answer: A

Question 40

Which among the following is not an inner planet?

- A Mercury
- B Saturn
- C Venus
- D Earth

Answer: B

Question 41

Earth is also known as

- A Orange planet
- B Green planet
- C Blue planet
- D Yellow planet

Answer: C

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Question 42

Who was the last Mughal emperor?

- A Babar
- B Noor Jehan
- C Akbar
- D Bahadur Shah

Answer: D

Question 43

Lal Bahadur Shastri was born in the year

- A 1844
- B 1864
- C 1884
- D 1904

Answer: D

Question 44

First Indian to win an Individual Olympic medal?

- A Milkha Singh
- B P.T. Usha
- C Leander Paes
- D K.D. Jadhav

Answer: D

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Question 45

Light travels fastest in which medium?

- A Nitrogen
- B Air
- C Steel
- D Vacuum

Answer: D

Question 46

What is impulse equal to?

- A Change in momentum
- B Change in force
- C Change in velocity
- D Change in acceleration

Answer: A

Question 47

Which country's constitution is the world's longest?

- A United States of America
- B China
- C India
- D Great Britain

Answer: C

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Question 48

Who among the following is addressed as the Chairman of Rajya Sabha?

- A Prime Minister
- B Chief Justice
- C VicePresident
- D Attorney General

Answer: C

Question 49

Ryder Cup is associated with which sport

- A Horse Race
- B Football
- C Cycling
- D Golf

Answer: D

Question 50

Who wrote the book "Passage to India"?

- A Anita Desai
- B Khushwant Singh
- C Mark Twain
- D E. M. Foster

Answer: D

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English

Instructions

For the following questions answer them individually

Question 51

Improve the bracketed part of the sentence.

The teacher said, "It is time that your daughter (has learned) how to write."

- A learned
- B had learnt
- C learnt
- D no improvement

Answer: C

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Question 52

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

For a moment I wasblinded by the camera's bright flash.

- A heavily
- B totally
- C greatly
- D powerfully

Answer: B

Question 53

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

As it was his first date,(A)/he dressed(B)/himself in best suit.(C)/No error(D)

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

Answer: C

Question 54

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

The vehicles involved in the accident werethe flow of traffic.

- A obstructing
- B stalling
- C interfering

D delaying

Answer: A

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Question 55

Select the synonym of gripe

A To grieve

B To grasp

C To flatter

D To hold

Answer: A

Question 56

Select the antonym of extravagance

A expensive

B thrift

C cheap

D absurd

Answer: B

Question 57

Select the antonym of virtuous

A vile

B chaste

C kosher

D celibate

Answer: A

Question 58

Select the word with the correct spelling.

A scuries

B snached

C cavortted

D Hispanic

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Answer: D

Question 59

Rearrange the parts of the sentence in correct order.

There was a second part Pare ambivalent about Qmany people
Rof her decision which

- A QRP
- B QPR
- C PRQ
- D RQP

Answer: D

Question 60

Select the synonym of stumpy

- A rangy
- B pudgy
- C lanky
- D lofty

Answer: B

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Question 61

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

The policeman said, "I saw a knife here."

- A The policeman exclaimed that he had seen a knife here.
- B The policeman said that he had seen a knife there.
- C The policeman said he had seen a knife here.
- D The policeman told he had seen a knife there.

Answer: B

Question 62

In the following question, out of the four alternatives, select the alternative which best expresses the meaning of the idiom/phrase.
Rome was not built in a day

- A It takes time to create great things
- B You have to win many wars to build an empire
- C A task done hurriedly fails completely

D Building anything worth while requires skill

Answer: A

Question 63

In the following question, out of the four alternatives, select the alternative which is the best substitute of the phrase. work extremely hard or incessantly.

A job

B craft

C toil

D activity

Answer: C

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Question 64

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

The audience are(A)/humbly requested to be(B)/seated in their seats.(C)/No error(D)

A A

B B

C C

D D

Answer: D

Question 65

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

I shall have written the full thesis by December.

A By December I shall have wrote the full thesis.

B The full thesis will have been written by me by December.

C The full Thesis will be wrote by me by December.

D By December the full thesis must have been wrote by me.

Answer: B

Question 66

In the following question, out of the four alternatives, select the alternative which is the best substitute of the phrase. express a proposition, theory, etc. in clear or definite terms.

A publish

B postulate

- C proclaim
- D enunciate

Answer: D

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Question 67

Rearrange the parts of the sentence in correct order.

He would often

PBrahmacharya if his protests were not functioning the way

Qhe expected

Rcritique his own life of

- A RQP
- B PQR
- C RPQ
- D QRP

Answer: C

Question 68

Select the word with the correct spelling.

- A genatics
- B sterage
- C grossest
- D granaite

Answer: C

Question 69

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

Rule of thumb

- A A rough unit of measure for small lengths
- B A broadly accurate guide based on practice
- C To force someone to work against his wish
- D To use your power to ensure discipline

Answer: B

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Question 70

Improve the bracketed part of the sentence.

(Take off) your shoes before you enter the temple.

- A Put away
- B Extract
- C Put off
- D No improvement

Answer: D

Instructions

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

The "Global Nutrition Report 2016" once again(1) India's slow overall progress(2) addressing chronic malnutrition, manifest in stunting (low weight for age), wasting (low weight for height), micronutrient(3) and overweight. Our track(4) in reducing the proportion of undernourished children over the past decade has been modest at best, and (5) what other countries with comparable socioeconomic indicators have achieved.

Question 71

(1)

- A demonstrates
- B demonstrated
- C demonstrated that
- D had demonstrated

Answer: A

Question 72

(2)

- A of
- B for
- C in
- D into

Answer: C

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Question 73

(3)

- A scarcities
- B lack
- C absence
- D deficiencies

Answer: D

Question 74

(4)

- A progress
- B record
- C report
- D result

Answer: B

Question 75

(5)

- A leads
- B fails
- C lags
- D falters

Answer: C

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Mathematics

Instructions

For the following questions answer them individually

Question 76

The ratio of present ages of Ramita and Satyajit is 9:7. After 9 years the ratio of their ages will be 5:4. What is Ramita's present age?

- A 81
- B 63
- C 56
- D 80

Answer: A

Explanation:

Let Ramita's present age = $9x$ years and Satyajit's present age = $7x$ years

According to ques, $\Rightarrow \frac{9x+9}{7x+9} = \frac{5}{4}$

$$\Rightarrow 36x + 36 = 35x + 45$$

$$\Rightarrow 36x - 35x = 45 - 36$$

$$\Rightarrow x = 9$$

\therefore Ramita's age = $9 \times 9 = 81$ years

\Rightarrow Ans - (A)

Question 77

$(\sec A - \tan A) / (\operatorname{cosec} A + \cot A)$ is equal to

- A $(\sec A - \cot A) / (\operatorname{cosec} A + \tan A)$
- B $(\sec A - \cos A) / (\operatorname{cosec} A + \sin A)$
- C $(\operatorname{cosec} A - \cot A) / (\sec A + \tan A)$
- D $(\sec A + \cos A) / (\operatorname{cosec} A - \sin A)$

Answer: C

Explanation:

Expression : $(\sec A - \tan A) / (\operatorname{cosec} A + \cot A)$

$$= \frac{(\sec A - \tan A)}{(\operatorname{cosec} A + \cot A)}$$

Multiplying both numerator and denominator by $(\operatorname{cosec} A - \cot A)$

$$= \frac{(\sec A - \tan A)(\operatorname{cosec} A - \cot A)}{(\operatorname{cosec} A + \cot A)(\operatorname{cosec} A - \cot A)}$$

$$= \frac{(\sec A - \tan A)(\operatorname{cosec} A - \cot A)}{\operatorname{cosec}^2 A - \cot^2 A}$$

$$= (\sec A - \tan A)(\operatorname{cosec} A - \cot A)$$

Multiplying both numerator and denominator by $(\sec A + \tan A)$

$$= (\sec A - \tan A)(\operatorname{cosec} A - \cot A) \times \frac{(\sec A + \tan A)}{(\sec A + \tan A)}$$

$$= \frac{(\operatorname{cosec} A - \cot A)(\sec^2 A - \tan^2 A)}{(\sec A + \tan A)}$$

$$= \frac{(\operatorname{cosec} A - \cot A)}{(\sec A + \tan A)}$$

=> Ans - (C)

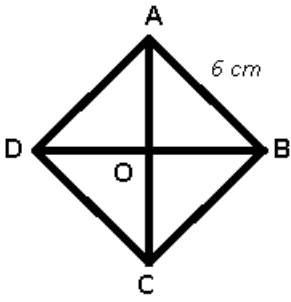
Question 78

ABCD is a kite where m angle A is 90° and m angle C is 60° . If length of AB is 6 cm, what is the length of diagonal AC?

- A $6(\sqrt{2} + \sqrt{3})$ cm
- B $2(\sqrt{3} + \sqrt{6})$ cm
- C $2(\sqrt{2} + \sqrt{3})$ cm
- D $3(\sqrt{2} + \sqrt{6})$ cm

Answer: D

Explanation:



Given : ABCD is a kite with AB = 6 cm

$\angle DAB = 90^\circ$ and $\angle BCD = 60^\circ$

To find : AC = ?

Solution : Diagonals of a kite intersect at 90° and bisect the angles opposite to them.

$\Rightarrow \angle OAB = 45^\circ$ and $\angle OCB = 30^\circ$

In $\triangle AOB$, $\sin(\angle OAB) = \frac{OB}{AB}$

$$\Rightarrow \sin(45) = \frac{OB}{6}$$

$$\Rightarrow \frac{1}{\sqrt{2}} = \frac{OB}{6}$$

$$\Rightarrow OB = \frac{6}{\sqrt{2}} = 3\sqrt{2} \text{ cm}$$

Similarly, $OA = 3\sqrt{2}$ cm

In $\triangle BCO$, $\tan(\angle OCB) = \frac{OB}{OC}$

$$\Rightarrow \tan(30) = \frac{3\sqrt{2}}{OC}$$

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

$$\Rightarrow OC = 3\sqrt{6} \text{ cm}$$

$$\therefore AC = OA + OC = 3\sqrt{2} + 3\sqrt{6}$$

$$= 3(\sqrt{2} + \sqrt{6}) \text{ cm}$$

\Rightarrow Ans - (D)

Question 79

A trader had 9 quintals of wheat. He sold a part of it at 10% profit and the rest at 20% profit, so that he made a total profit of 14%. How much wheat did he sell at 20% profit?

- A 540 kg
- B 360 kg
- C 180 kg
- D 720 kg

Answer: B

Explanation:

1 quintal = 100 kg \Rightarrow 9 quintals = 900 kg

Let the part he sold at 20% profit = x kg

\Rightarrow Part he sold at 10% profit = $(900 - x)$ kg

Total profit made by the trader = 14%

$$\Rightarrow 20x + 10(900 - x) = 14 \times 900$$

$$\Rightarrow 20x + (10 \times 900) - 10x = 14 \times 900$$

$$\Rightarrow 10x = 900 \times (14 - 10)$$

$$\Rightarrow x = 90 \times 4 = 360 \text{ kg}$$

\Rightarrow Ans - (B)

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Question 80

Find 2 consecutive natural numbers, sum of whose squares is 25.

A 2, 3

B 3, 4

C 4, 5

D 1, 4

Answer: B

Explanation:

Let the consecutive natural numbers be x , $(x + 1)$

Sum of their squares = $(x)^2 + (x + 1)^2 = 25$

$$\Rightarrow x^2 + (x^2 + 2x + 1) = 25$$

$$\Rightarrow 2x^2 + 2x + 1 - 25 = 0$$

$$\Rightarrow x^2 + x - 12 = 0$$

$$\Rightarrow x^2 + 4x - 3x - 12 = 0$$

$$\Rightarrow x(x + 4) - 3(x + 4) = 0$$

$$\Rightarrow (x + 4)(x - 3) = 0$$

$$\Rightarrow x = -4, 3$$

Since, the numbers are natural, thus $x \neq -4$

\therefore Numbers are = 3, 4

\Rightarrow Ans - (B)

Question 81

A factory buys 7 machines. 2 MachineA, 4 MachineB and rest MachineC. Prices of the machines are Rs 56000, Rs 45000 and Rs 30000 respectively. Calculate the average cost of these machines.

A 46000

B 43666.66

C 41333.33

D 44500

Answer: A

Explanation:

Cost of machines A, B and C respectively are : Rs. 56000, 45000 and 30000

Number of machines A, B and C respectively are : 2, 4, 1

$$\Rightarrow \text{Total cost} = (2 \times 56000) + (4 \times 45000) + (1 \times 30000)$$

$$= 112,000 + 180,000 + 30,000 = \text{Rs. } 322,000$$

$$\therefore \text{Average cost} = \frac{3,22,000}{7} = \text{Rs. } 46,000$$

\Rightarrow Ans - (A)

Question 82

Coefficient of x^2 in $6x^3 + 4x^2 + 2x + 3$ is

A 4

B 6

C 3

D 2

Answer: A

Explanation:

A coefficient is a numerical or constant quantity placed before and multiplying the variable in an algebraic expression. Eg : In ax^2 , coefficient is a

$$\text{Expression : } 6x^3 + 4x^2 + 2x + 3$$

$$\Rightarrow \text{Coefficient of } x^2 = 4$$

\Rightarrow Ans - (A)

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Question 83

Azhar is 4 times as good a workman as Balaraj and therefore is able to finish a job in 45 days less than Balaraj. Working together, they can do it in:

A 6 days

B 18 days

C 24 days

D 12 days

Answer: D

Explanation:

Ratio of times taken by Azhar and Balaraj = 1 : 4

The time difference is (4 - 1) 3 days while Balaraj take 4 days and Azhar takes 1 day.

If difference of time is 3 days, Balaraj takes 4 days.

If difference of time is 45 days, Balaraj takes = $\frac{4}{3} \times 45 = 60$ days

So, Azhar takes 15 days

$$\text{Azhar's 1 day's work} = \frac{1}{15}$$

$$\text{Balaraj's 1 day's work} = \frac{1}{60}$$

$$(\text{Azhar + Balaraj})\text{'s 1 day's work together} = \frac{1}{15} + \frac{1}{60} = \frac{4+1}{60} = \frac{1}{12}$$

\therefore Azhar and Balaraj together can do the work in = 12 days

=> Ans - (D)

Question 84

Find k, if the line $2x - 3y = 11$ is perpendicular to the line $3x + ky = 4$?

- A -2
- B -1
- C 1
- D 2

Answer: D

Explanation:

Slope of line $2x - 3y = 11$ is $-\frac{2}{-3}$
 $= \frac{2}{3}$

Slope of line $3x + ky = 4$ is $-\frac{3}{k}$

Also, product of slopes of two perpendicular lines is -1

$$\Rightarrow \frac{2}{3} \times \frac{-3}{k} = -1$$

$$\Rightarrow \frac{-2}{k} = -1$$

$$\Rightarrow k = -2 \times -1 = 2$$

=> Ans - (D)

Question 85

On dividing $8a^2b^2c^2$ by $4a^2$, we get

- A $2b^2$
- B $2c^2$
- C $2b^2c^2$
- D 2

Answer: C

Explanation:

On dividing $8a^2b^2c^2$ by $4a^2$

$$= \frac{8a^2b^2c^2}{4a^2}$$

$$= 4 \times \frac{a^2}{a^2} \times (b^2c^2)$$

$$= 2b^2c^2$$

=> Ans - (C)

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Question 86

The point P (a,b) is first reflected in origin to P1 and P1 is reflected in Yaxis to (4,3). The coordinates of point P are

- A (4,-3)
- B (4,6)
- C (3,4)
- D (3,6)

Answer: A

Explanation:

$P(a,b)$ after reflection at the origin = $(-a,-b)$

Reflection of point $(-a,-b)$ in the y -axis is $(a,-b)$

According to ques,

$$\Rightarrow (a, -b) = (4, 3)$$

$$\Rightarrow a = 4 \text{ and } b = -3$$

\therefore Coordinates of Point $P = (4,-3)$

\Rightarrow Ans - (A)

Question 87

An engineering student has to secure 25% marks to pass. He gets 45 and fails by 45 marks. Find the maximum marks.

- A 385 marks
- B 410 marks
- C 435 marks
- D 360 marks

Answer: D

Explanation:

Let maximum marks = $100x$

$$\Rightarrow \text{Passing marks} = \frac{25}{100} \times 100x = 25x$$

According to ques,

$$\Rightarrow 25x - 45 = 45$$

$$\Rightarrow 25x = 45 + 45 = 90$$

$$\Rightarrow x = \frac{90}{25} = \frac{18}{5}$$

$$\therefore \text{Maximum marks} = 100 \times \frac{18}{5} = 360$$

\Rightarrow Ans - (D)

Question 88

A man travels 430 kilometres in, partly by rail and partly by steamer. He spends 10 hours more time on steamer. If the velocity of the steamer is 25 km/hr and the velocity of rail is 65 km/hr, how much distance does he cover by steamer?

- A 360 km
- B 300 km
- C 450 km

D 540 km

Answer: B

Explanation:

Let distance covered by steamer = d km

=> Distance covered by rail = $(430 - d)$ km

Let time taken on rail = t hours and time taken on steamer = $(t + 10)$ hours

Speed of rail = 65 km/hr and speed of steamer = 25 km/hr

Using, speed = distance/time

For steamer, $\frac{d}{t+10} = 25$

=> $d = 25t + 250$ -----(i)

For rail, $\frac{430-d}{t} = 65$

Substituting value of d from equation (i), we get :

=> $430 - (25t + 250) = 65t$

=> $430 - 250 = 65t + 25t = 90t$

=> $t = \frac{180}{90} = 2$ hours

Substituting value of t in equation (i), => $d = (25 \times 2) + 250$

= $50 + 250 = 300$ km

=> Ans - (B)

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Question 89

The largest 5 digit number exactly divisible by 89 is:

A 99947

B 99940

C 99938

D 99939

Answer: A

Explanation:

Largest 5 digit number = 99999

If 99999 is divided by 89, => $99999 = 89 \times 1123 + 52$

Quotient is 1123 and remainder is 52

Thus, largest 5 digit number which is divisible by 89 = $99999 - 52$

= 99947

=> Ans - (A)

Question 90

$\sqrt{\frac{1+\tan^2 A}{\tan^2 A}}$ is equal to

A secA

- B $\sin A$
- C $\operatorname{cosec} A$
- D $\cos A$

Answer: C

Explanation:

$$\text{Expression: } \sqrt{\frac{1 + \tan^2 A}{\tan^2 A}}$$

$$\because (\sec^2 A - \tan^2 A = 1)$$

$$= \sqrt{\frac{\sec^2 A}{\tan^2 A}} = \frac{\sec A}{\tan A}$$

$$= \frac{1}{\cos A} \div \frac{\sin A}{\cos A}$$

$$= \frac{1}{\cos A} \times \frac{\cos A}{\sin A}$$

$$= \frac{1}{\sin A} = \operatorname{cosec} A$$

=> Ans - (C)

Question 91

On a certain principal if the simple interest for two years is Rs 2800 and compound interest for the two years is Rs 2996, what is the rate of interest?

- A 14 percent
- B 7 percent
- C 28 percent
- D 21 percent

Answer: A

Explanation:

Let the principal amount = Rs. $100x$ and rate of interest = $r\%$

Time period = 2 years

$$\text{Simple Interest} = \frac{P \times R \times T}{100} = 2800$$

$$\Rightarrow \frac{100x \times r \times 2}{100} = 2800$$

$$\Rightarrow 2rx = 2800$$

$$\Rightarrow x = \frac{2800}{2r} = \frac{1400}{r}$$

$$\text{Compound Interest} = P \left[\left(1 + \frac{R}{100} \right)^T - 1 \right] = 2996$$

$$\Rightarrow 100x \left[\left(1 + \frac{r}{100} \right)^2 - 1 \right] = 2996$$

$$\Rightarrow 100x \left[\left(1 + \frac{r^2}{100^2} + 2 \frac{r}{100} \right) - 1 \right] = 2996$$

$$\Rightarrow \left(100 \times \frac{1400}{r} \right) \left[10000 + 100 \right] = 2996$$

$$\Rightarrow 14r + 2800 = 2996$$

$$\Rightarrow 14r = 2996 - 2800 = 196$$

$$\Rightarrow r = \frac{196}{14} = 14\%$$

=> Ans - (A)

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Question 92

A rectangular swimming pool of length 20 m and breadth 10 m has a uniformly sloping floor. It is 1 m in depth on one end of its length and 3 m at the other. How much water is needed to completely fill this pool? (Take $\pi = 22/7$)

- A 800 cubic metres
- B 300 cubic metres
- C 480 cubic metres
- D 400 cubic metres

Answer: D

Explanation:

The pool is 1 m in depth on one end of its length and 3 m at the other, thus the pool is in the shape of a trapezium whose volume will be equal to the product of area of trapezium and the width.

Length = 20 m and breadth = 10 m

$$\Rightarrow \text{Volume} = \left(\frac{1}{2} \times (1 + 3) \times 20\right) \times 10$$

$$= 40 \times 10 = 400 \text{ m}^3$$

\Rightarrow Ans - (D)

Question 93

What is the value of $\sec \frac{4\pi}{3}$?

- A 5
- B -2
- C $-\frac{2}{\sqrt{3}}$
- D $\frac{2}{\sqrt{5}}$

Answer: B

Explanation:

Expression : $\sec \frac{4\pi}{3}$

$$= \sec\left(\pi + \frac{\pi}{3}\right)$$

$$= -\sec\left(\frac{\pi}{3}\right)$$

$$= -2$$

\Rightarrow Ans - (B)

Question 94

Find the radius of the circle if the area of its sector is 30.8 sq cm whose corresponding central angle is 72° ?

- A 3.5 cm
- B 7 cm
- C 14 cm
- D 10.5 cm

Answer: B

Explanation:

Let radius = r cm and central angle = $\theta = 72^\circ$

$$\text{Area of sector} = \frac{\theta}{360} \times \pi r^2$$

$$= \frac{72}{360} \times \frac{22}{7} \times (r)^2 = 30.8$$

$$= \frac{1}{5} \times \frac{22}{7} \times (r)^2 = 30.8$$

$$= \frac{22}{7} \times (r)^2 = 30.8 \times 5 = 154$$

$$\Rightarrow (r)^2 = 154 \times \frac{7}{22} = 49$$

$$\Rightarrow r = \sqrt{49} = 7 \text{ cm}$$

\Rightarrow Ans - (B)

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Question 95

If $2x + 6y = 3xy$ and $10x - 3y = 4xy$, find x, y .

A 3, 2

B 2, 3

C 4, 6

D 6, 4

Answer: A

Explanation:

Equation 1 : $2x + 6y = 3xy$

Equation 2 : $10x - 3y = 4xy$

Dividing both equations by (xy)

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

and $\frac{10}{y} - \frac{3}{x} = 4$

Let $\frac{1}{y} = u$ and $\frac{1}{x} = v$

$$\Rightarrow 2u + 6v = 3 \text{ -----(iii)}$$

$$\text{and } 10u - 3v = 4 \text{ -----(iv)}$$

Multiplying equation (iv) by 2 and adding it to equation (iii), we get :

$$\Rightarrow 22u = 11$$

$$\Rightarrow u = \frac{11}{22} = \frac{1}{2}$$

Substituting it in equation (iii), $\Rightarrow 6v = 3 - 1 = 2$

$$\Rightarrow v = \frac{2}{6} = \frac{1}{3}$$

$$\therefore (x, y) = (3, 2)$$

\Rightarrow Ans - (A)

Question 96

If a merchant offers a discount of 10% on the list price, then she makes a loss of 25%. What % profit or % loss will she make if she sells at a discount of 20% of the list price?

- A 5 percent profit
- B 33.33 percent loss
- C 90 percent profit
- D 20 percent profit

Answer: B

Explanation:

Let list price = Rs. $100x$

After 10% discount, selling price = $\frac{100-10}{100} \times 100x = \text{Rs. } 90x$

Let Cost price = Rs. y

$$\Rightarrow \text{Loss \%} = \frac{y-90x}{y} \times 100 = 25$$

$$\Rightarrow \frac{y-90x}{y} = \frac{25}{100} = \frac{1}{4}$$

$$\Rightarrow 4y - 360x = y$$

$$\Rightarrow 4y - y = 360x$$

$$\Rightarrow y = \frac{360x}{3} = 120x$$

If discount = 20%, \Rightarrow Selling price = $\frac{100-20}{100} \times 100x = \text{Rs. } 80x$

$$\therefore \text{Loss \%} = \frac{120x-80x}{120x} \times 100$$

$$= \frac{40}{120} \times 100 \approx 33.33\%$$

\Rightarrow Ans - (B)

Question 97

Refer the below data table and answer the following Question.

	Boys	Girls
Medical	35	80
Engineering	90	30

What percent students who chose Engineering are girls?

- A 25
- B 12.77
- C 27.27
- D 33.33

Answer: A

Explanation:

Number of girls who chose engineering = 30

Total number of students who chose engineering = $30 + 90 = 120$

$$\Rightarrow \text{Percent of the girls who choose engineering} = \frac{30}{120} \times 100$$

$$= \frac{100}{4} = 25\%$$

=> Ans - (A)

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Question 98

Refer the below data table and answer the following Question.

	Cumulative Production
January	330
February	580
March	1210
April	1800
May	2330
June	2870

How many cars were manufactured in the months of April and May?

- A 1070
- B 1120
- C 1220
- D 4130

Answer: B

Explanation:

Number of cars produced in :

January = 330

February = $580 - 330 = 250$

March = $1210 - 580 = 630$

April = $1800 - 1210 = 590$

May = $2330 - 1800 = 530$

June = $2870 - 2330 = 540$

=> Number of cars that were manufactured in the month of the April and may = $590 + 530 = 1120$

=> Ans - (B)

Question 99

Refer the below data table and answer the following Question.

Day of the Week	Distance Jogged (in Kms)
Monday	4.5
Tuesday	0.5
Wednesday	1.5
Thursday	2.5
Friday	4
Saturday	4
Sunday	3.5

If 400 calories are burned by jogging 5km, how many calories were burnt in the given week?

- A 1690 calories
- B 1590 calories

C 1540 calories

D 1640 calories

Answer: D

Explanation:

Total distance jogged in entire week

$$= 4.5 + 0.5 + 1.5 + 2.5 + 4 + 4 + 3.5 = 20.5 \text{ km}$$

Calories burned after jogging 5 km = 400 calories

$$\Rightarrow \text{Calories burned after jogging 20.5 km} = \frac{400}{5} \times 20.5$$

$$= 80 \times 20.5 = 1640 \text{ calories}$$

\Rightarrow Ans - (D)

Question 100

Refer the below data table and answer the following Question.

Items	Yearly Expense in Rs lakhs
Raw Materials	7
Labour	6
Rent	5
Interest	5
Taxes	3

Rent and Taxes are what percent of total expenses?

A 30.77 percent

B 23.52 percent

C 16.27 percent

D 38.02 percent

Answer: A

Explanation:

Yearly expense in rent and taxes (in lakhs) = 5 + 3 = 8

Total expenses (in lakhs) = 7 + 6 + 5 + 5 + 3 = 26

$$\Rightarrow \text{Required \%} = \frac{8}{26} \times 100$$

$$= \frac{400}{13} \approx 30.77\%$$

\Rightarrow Ans - (A)

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