SSC CGL 3rd March 2020 Shift-2

General Intelligence and Reasoning

Instructions
For the following questions answer them individually

Question 1

In a certain code language, 'HAMMER'is written as 'ICPQJX'. How will 'WRENCH' be written as in that language?

A XTIRIN

B XTIRHN

C XTHRIN

D XTHRHN

Answer: D

Explanation:
H + 1 = I
A + 2 = C
M + 3 = P
M + 4 = Q
E + 5 = J
R + 6 = X
Similarly,
W + 1 = X
R + 2 = T
E + 3 = H
N + 4 = R
C + 5 = H
H + 6 = N

'WRENCH' is written as 'XTHRHN'.
∴ The correct answer is option D.

Question 2

Select the option figure in which the given figure is embedded (rotation is not allowed).

A

B

C 

D 

Answer: A

Explanation:

∴ The correct answer is option A.

Question 3

In certain code language, 'PEN' is coded as '321028'. How will 'TUB' be coded as in that language?

A 40422

B 40424

C 42404

D 44024

Answer: B

Explanation:

P $\rightarrow$ 16 $\times$ 2 = 32

E $\rightarrow$ 5 $\times$ 2 = 10

N $\rightarrow$ 14 $\times$ 2 = 28

Similarly,

For 'TUB',

T $\rightarrow$ 20 $\times$ 2 = 40

U $\rightarrow$ 21 $\times$ 2 = 42

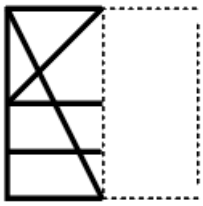
B $\rightarrow$ 2 $\times$ 2 = 4

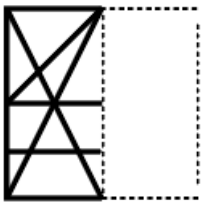
'TUB' be coded as '40424'.

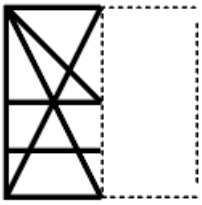
∴ The correct answer is option is option B.

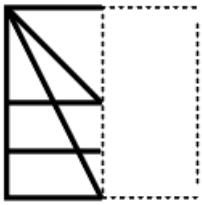
Question 4

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

A 

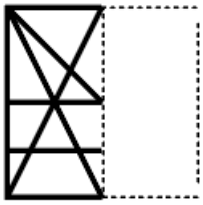
B 

C 

D 

Answer: C

Explanation:
The sheet shows as,



∴ The correct answer is option C.

Question 5

Select the number that can replace the question mark (?) in the following series.
55, 58, 64, ? , 85

A 77

B 70

C 67

D 73

Answer: D

Explanation:
The series follows patter as,

55 + 3 = 58
58 + 6 = 64
64 + 9 = 73
73 + 12 = 85
∴ The correct answer is option D.

Question 6

Select the letter that can replace the question mark (7?) in the following series.
J, M, P, ?, V, Y

A T

B O

C S

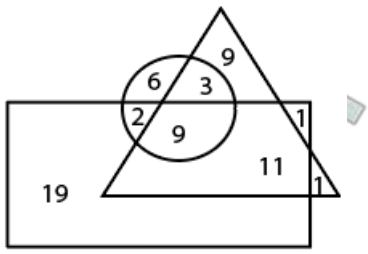
D R

Answer: C

Explanation:
The series follows pattern as,
J + 3 = M
M + 3 = P
P + 3 = S
S + 3 = V
V + 3 = Y
∴ The correct answer is option C.

Question 7

In the given Venn diagram, the 'circle' represents 'ladies', the 'triangle' represents 'teachers', and the 'rectangle' represents 'unmarried persons'. The numbers given in the diagram represent the number of persons in that particular category.



How many married ladies are teachers?

A 9

B 11

C 3

D 6

Answer: C

Explanation:
Number of married ladies which are teachers = 3
∴ The correct answer is option C.

Question 8

Four number-pairs have been given, out of which three are alike in some manner and one is different. Select the number-pair that is different from the rest.

A 39 - 72

B 28 - 60

C 42 - 36

D 57 - 38

Answer: D

Explanation:
In 39 - 72,
3 + 9 = 12
12 × 6 = 72
In 28 - 60,
2 + 8 = 10
10 × 6 = 60
In 42 - 36,
4 + 2 = 6
6 × 6 = 36
In 57 - 38,
5 + 7 = 12
12 × 6 = 72
∴ The correct answer is option D.

Question 9

Select the option in which the words share the same relationship as that shared by the given pair of words.
Faculty : Teachers

A Ants : Flock

B Fleet : Trucks

C Galaxy : Apartments

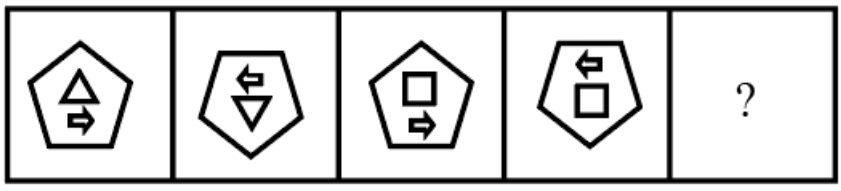
D Colony : Wolves

Answer: B

Explanation:
As Faculty and teachers as Fleet and trucks are same category.
∴ The correct answer is option B.

Question 10

Select the figure that can replace the question mark (?) in the following series.



A 

B 

C 

D 

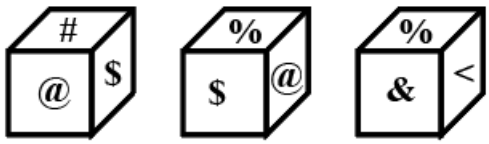
Answer: D

Explanation:
The figure rotate 180° in each step so, next figure,

∴ The correct answer is option D.

Question 11

Three different positions of the same dice are shown. Select the symbol that will be on the face opposite to the one showing <'.



A #

B @

C &

D $

Answer: B

Explanation:
From last two figures,
% = %
@ = <

$ = &
Opposite face of '<' is '@'.
∴ The correct answer is option B.

Question 12

Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.
Statements:
1. All dogs are lions.
2. No elephant is a lion.
Conclusions:
I. No dog is an elephant.
II. No lion is a dog.
III. Some elephants are dogs.

A Only conclusion I follows.

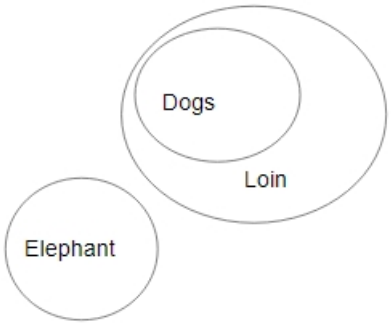
B Only conclusions II and ITI follow.

C Only conclusions I and III follow.

D Only conclusionII follows.

Answer: A

Explanation:



By the Venn diagram,
Only conclusion I follows.
∴ The correct answer is option A.

Question 13

Eight words have been given, out of which seven are alike in some manner and one is different. Select the odd word.
Monitor, Headphone, Mouse, Keyboard, Windows, Printer, Scanner, Speaker

A Mouse

B Printer

C Monitor

D Windows

Answer: D

Explanation:
Except windows remaining all are hardware.
∴ The correct answer is option D.

Question 14

Select the option that is related to the third number in the same way as the second number is related to the first number.
2809 : 53 :: 1504 : ?

A 31

B 35

C 32

D 33

Answer: C

Explanation:
2809 $\rightarrow$ (5 - 3)(5 + 3)(3^2) = 2809
Similarly,
1524 $\rightarrow$ (3 - 2)(3 + 2)(2^2) = 1504
$\therefore$ The correct answer is option C.

Question 15

Four letter-clusters have been given, out of which three are alike in some manner and one is different. Select the odd letter-cluster.

A JMPS

B BEHK

C ADGJ

D FHKM

Answer: D

Explanation:
Except the option D remaining all have difference of 2 in each letter so,
Odd letter-clusters = FHKM
$\therefore$ The correct answer is option D.

Question 16

In an exam of 80 questions, a correct answer is given +1 mark, a wrong answer is given −1 mark, and if a question is not attempted there are zero marks. If a student attempted only 80% of the questions and got 32 marks, then how many questions did he answer correctly?

A 32

B 48

C 16

D 56

Answer: B

Explanation:
Attempted questions = $80 \times \frac{80}{100}$ = 64
Marks got = 32

Marks deduct = 64 - 32 = 32

So, Wrong answer = 32/2 = 16

So, Correct answer = 32 + 16 = 48

∴ The correct answer is option B.

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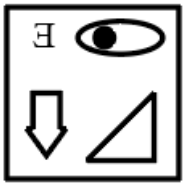
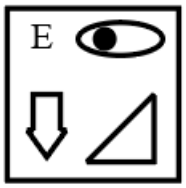
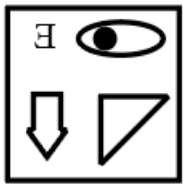
Question 17

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

A 

B 

C 

D 

Answer: A

Explanation:
Option A is the mirror image.

∴ The correct answer is option A.

Question 18

Study the given pattern carefully and select the number that can replace the question mark (?) in it.

5	4	41
15	6	?
9	11	202

A 212

B 209

C 261

D 122

Answer: C

Explanation:
$5^2 + 4^2$ = 25 + 16 = 41
$9^2 + 11^2$ = 81 + 121 = 202
Similarly,
$(15)^2 + 6^2$ = 225 + 36 = 261
∴ The correct answer is option C.

Question 19

Arrange the following words in a logical and meaningful order.
1. Hexagon
2. Nonagon
3. Pentagon
4. Heptagon
5. Octagon

A 3-1-4-5-2

B 1-4-5-2-3

C 1-3-4-5-2

D 4-3-1-2-5

Answer: A

Explanation:
Words according to the English dictionary,
Pentagon, Hexagon, Heptagon, Octagon, Nonagon
∴ The correct answer is option A.

Question 20

Select the letter-cluster that can replace the question mark (?) in the following series.
BRH, ZUD, ? , VAV, TDR, RGN

A XZZ

B XYZ

C XZY

D XXZ

Answer: D

Explanation:
(B + 24)(R + 3)(H - 4) = ZUD
(Z + 24)(U + 3)(D - 4) = XXZ
(X + 24)(X + 3)(Z - 4) = VAV
(V + 24)(A + 3)(V - 4) = TDR
(T + 24)(D + 3)(R - 4) = RGN
∴ The correct answer is option D.

Question 21

$A + B$ means 'B is the brother of A':
$A - B$ means 'A is the mother of B':
$A \times B$ means 'A is the father of B':
$A \div B$ means 'A is the son of B'.
If, $P + R \times T - Q \div S + U$, then how is S related to R?

A Grandfather

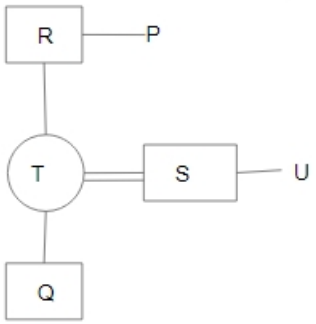
B Brother

C Grandson

D Son-in-law

Answer: D

Explanation:
In the diagram, Circle shows the female, square shows the male, vertical lines show the generation, single horizontal line shows the brother/sister and double horizontal lines show the couple.



From the diagram,
'S' is son-in-law of 'R'.
∴ The correct answer is option D.

Question 22

Study the given pattern carefully and select the number that can replace the question mark (?) in it.

7	13	6
4	22	18
15	?	7

A 23

B 24

C 22

D 21

Answer: C

Explanation:
7 + 6 = 13
4 + 18 = 22
15 + 7 = 22
∴ The correct answer is option C.

Question 23

Which two signs should be interchanged to make the given equation correct?

$36 \div 2 \times 12 + 3 - 6 = 24$

A $- and \div$

B $\times and -$

C $+ and \times$

D $\div and \times$

Answer: B

Explanation:

$36 \div 2 \times 12 + 3 - 6 = 24$

From the option B,

$36 \div 2 - 12 + 3 \times 6 = 24$

$18 - 12 + 18 = 24$

24 = 24

∴ The correct answer is option B.

Question 24

'Cardiologist' is related to 'Heart' in the same way as 'Neurologist' is related to '_____'.

A Lungs

B Brain

C Teeth

D Ears

Answer: B

Explanation:

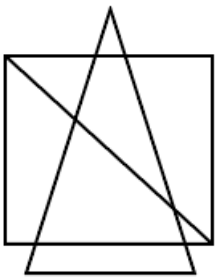
'Cardiologist deals with the disorders of the heart similarly,

'Neurologist' deals with the disorders of the brain.

∴ The correct answer is option B.

Question 25

How many triangles are there in the given figure?



A 8

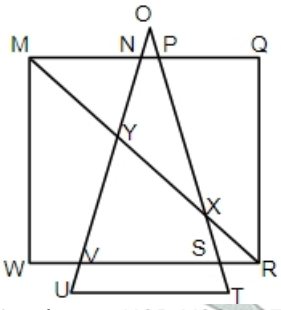
B 10

C 12

D 6

Answer: B

Explanation:



Triangles are NOP, VOS, UOT, RXS, RYV, RMW,MNY, MPX, MQR, YOX
Total number of triangles = 10
∴ The correct answer is option B.

General Awareness

Instructions
For the following questions answer them individually

Question 26

The bodies that glow during the night sky are known as:

A Celestial bodies

B Asteroids

C Constellation

D Meteroid

Answer: A

Question 27

Archaeologist R Nagaswamy was honoured at the Silver Jubilee International Conference of Art by which country?

A Bhutan

B Nepal

C Bangladesh

D China

Answer: C

Question 28

In which state has the Khadi and Village Industries Commission (KVIC) opened the first silk processing plant?

A Maharashtra

B Tamil Nadu

C Karnataka

D Gujarat

Answer: D

Question 29

In January 2020, Home Minister Amit Shah released a book 'Karmayoddha Granth'. This book is based on the life of _____.

A Jawaharlal Nehru

B Narendra Modi

C Sardar Vallabhbhai Patel

D Mahatma Gandhi

Answer: B

Question 30

Which state's Legislative Assembly adopted a new logo consisting of the national emblem and foxtail orchid (Rhynchostylis Retusa), the state flower, in January 2020?

A Mizoram

B Meghalaya

C Tripura

D Arunachal Pradesh

Answer: D

Question 31

In which of the following states is the Madhavpur Mela celebrated?

A Gujarat

B Madhya Pradesh

C Uttar Pradesh

D Bihar

Answer: A

Question 32

Which of the following festivals means "merry marking of the Gods"?

A Diwali

B Pongal

C Lai Haraoba

D Makar Sankranti

Answer: C

Question 33

Ajatashatru, a ruler of the Haryanka Dynasty, was the son of _____.

A Naga-Dasak

B Udayin

C Anurudha

D Bimbisara

Answer: D

Question 34

Which of the following glands is present between the lungs?

A Thymus

B Pituitary

C Hypothalamus

D Pineal

Answer: A

Question 35

Which of the following is not a vertebrate?

A Snail

B Bird

C Mammal

D Fish

Answer: A

Question 36

Which law of physics states that the force between the two electric charges reduces to a quarter of its former value when the distance between them is doubled?

A Coulomb’s Law

B Stefan's Law

C Pascal's Law

D Hooke's Law

Answer: A

Question 37

In which of the following countries was the 95th edition of the prestigious Hastings International Chess Congress held?

A France

B Australia

C England

D Belgium

Answer: C

Question 38

When we cut an onion, the synthase enzyme converts the amino acid sulfoxides of the onion into which acid?

A Sulfenic acid

B Citric acid

C Nitric acid

D Sulphuric acid

Answer: A

Question 39

Which of the following is the major component of vinegar?

A Citric acid

B Lactic acid

C Nitric acid

D Acetic acid

Answer: D

Question 40

Which of the following was previously known as 'the Lady Willingdon Park'?

A Buddha Jayanti Park

B Mughal Gardens

C Deer Park

D Lodhi Gardens

Answer: D

Question 41

'Industry 4.0' is a complex cyber-physical system which synergies production with digital technologies. The Ministry of Railways and the Department of Science and Technology have joined hands in partnership with which institution for taking up a unique project on 'Industry 4.0'?

A IIT Kanpur

B IIT Bombay

C IIT Madras

D IIT Delhi

Answer: A

Question 42

Who among the following was honoured with the 50th Dadasaheb Phalke Award?

A Anupam Kher

B Naseeruddin Shah

C Amitabh Bachchan

D Kamal Haasan

Answer: C

Question 43

In which district of Karnataka is the Brahmagiri Wildlife Sanctuary located?

A Hassan

B Mandya

C Udupi

D Kodagu

Answer: D

Question 44

Who among the following was the last ruler of the Nanda dynasty?

A Dhanananda

B Panduka

C Govishanaka

D Kaivarta

Answer: A

Question 45

What was India's position in the Brand Finance Nation ranking of 2019?

A Seventh

B Sixth

C Third

D Fifth

Answer: A

Question 46

Who became the first Indian equestrian to qualify for the Tokyo Olympics 2020?

A Fouaad Mirza

B Amit Sinsinwar

C Sehej Singh Virk

D Amar Sarin

Answer: A

Question 47

In which state was the Global Investors Meet, ASCEND 2020 organised?

A Maharashtra

B Kerala

C Rajasthan

D Gujarat

Answer: B

Question 48

Wings India 2020 is scheduled to be held in which of the following airports?

A Begumpet Airport

B Warangal Airport

C Rajahmundry Airport

D Vijayawada Airport

Answer: A

Question 49

Borra caves are situated on the East Coast of India in which of the following hills?

A Nallamala Hills

B Horsley Hills

C Nagari Hills

D Ananthagiri Hill

Answer: D

Question 50

In which year was the foundation stone for the Gateway of India laid in Bombay (now Mumbai)?

A 1913

B 1915

C 1905

D 1920

Answer: A

SSC CGL Free Mock Test

Quantitative Aptitude

Instructions
For the following questions answer them individually

Question 51

A can complete a certain piece of work in 40 days. B is 25% more efficient than A and C is 28% more efficient than B. They work together for 5 days. The remaining work will be completed by B alone, in:

A $20\frac{3}{4}$ days

B $16\frac{1}{5}$ days

C $16\frac{3}{5}$ days

D $20\frac{1}{2}$ days

Answer: C

Explanation:
Let the efficiency of A be x.

Efficiency of B = 25% more efficient than A = 1.25x

Efficiency of C = 28% more efficient than B = $1.25x \times \frac{128}{100}$ = 1.6x

Efficiency ratio of A, B and C = x: 1.25x : 1.6x = 20 : 25 :32

Total work = efficiency $\times$ time = 20 $\times$ 40 = 800 units

5 days work = (20 + 25 + 32) $\times 5 = 77 \times$ 5 = 385 units

Remaining work = 800 - 385 = 415 units

Time taken to complete work by B = 415/25 = $16\frac{3}{5}$

Question 52

A race track is in the shape of a ring whose inner and outer circumferences are 440 m and 506 m,respectively. What is the cost of levelling the track at ₹6/m^2? (Take $\pi = \frac{22}{7}$)

A ₹ 18,966

B ₹ 24,832

C ₹ 19,866

D ₹ 29,799

Answer: D

Explanation:
Outer circumference = 506 m

2π r = 506

r = $253/\pi$

Inner circumference = 440 m

2π r = 440

r = $220/\pi$

Area = πr^2

Area of the track = outer area - inner area

$= \pi \times (253/\pi)^2 - \pi \times (220/\pi)^2$

$= \frac{1}{\pi}(253^2 - 220^2)$

$= \frac{1}{\pi}(64009 - 48400)$

$= \frac{1}{22/7} \times (15609) = 4966.5m^2$

The cost of leveling the track = Rs.6/m ^{2}

Total cost = 4966.5 × 6 = Rs.29799

Question 53

The compound interest on a certain sum at 10% p.a. for $2\frac{1}{3}$ years is ₹1,201.60, interest compounded yearly. The sum is:

A ₹ 4,200

B ₹ 4,800

C ₹ 5,400

D ₹ 4,500

Answer: B

Explanation:
r = 10%

Time(t) = $2\frac{1}{3} = 7/3 years$

Compound interest = 1201.6

Compound interest = $p(1 + \frac{r}{100})^t - p$

1201.6 = $p(1 + \frac{10}{100})^{7/3} - p$

1201.6 = $p(1 + \frac{10}{100})^{(2+1/3)} - p$

1201.6 = $p \times (110/100) \times (110/100) \times (110/100)^{1/3} - p$

1201.6 = 1.25p - p

p = 1201.6/0.25 = 4806.4 ≈ Rs.4800

∴ The sum is Rs.4800.

Question 54

The given table represents the number of engineers recruited by four companies A, B, C and D over the years. Study the table carefully and answer the question that follows.

Company → / Year ↓	A	B	C	D
2014	120	90	85	105
2015	132	118	93	97
2016	128	98	94	100
2017	140	106	98	116
2018	148	112	105	125
2019	150	118	110	122

The ratio of the total number of engineers recruited by companies A and B in 2015 and 2018 to the total number of engineers recruited by C and D in 2014 and 2018,is:

A 28 : 19

B 13 : 21

C 17 : 14

D 9 : 14

Answer: C

Explanation:
Total number of engineers recruited by companies A and B in 2015 and 2018 = 132 + 118 + 148 + 112 = 510

Total number of engineers recruited by C and D in 2014 and 2018 = 85 + 105 + 105 + 125 = 420

The ratio of the total number of engineers recruited by companies A and B in 2015 and 2018 to the total number of engineers recruited by C and D in 2014 and 2018 = 510 : 420 = 17 : 14

Question 55

Two bottles of the same capacity are 35% and $33\frac{1}{3}\%$ full of orange juice, respectively. They are filled up completely with apple juice and then the contents of both bottles are emptied into another vessel. The percentage of apple juice in the mixture is:

A $34\frac{1}{6}$

B $64\frac{1}{3}$

C $60\frac{2}{3}$

D $65\frac{5}{6}$

Answer: D

Explanation:
Let the capacity of bottles be 100 units.

Total capacity = 100 + 100 = 200 units

Apple juice in 1st bottle = 100 - 35 = 65

Apple juice in 2nd bottle = 100 - $33\frac{1}{3}$ = 200/3

Total apple juice = 65 + 200/3= 395/3

The percentage of apple juice in the mixture = $\frac{395}{3\times 200} \times 100 = 65\frac{5}{6}\%$

Question 56

In △ ABC, AB = AC and AL is perpendicular to BC at L. In △ DEF, DE = DF and DM is perpendicular to EF at M.If (area of △ ABC) (area of △ DEF) = 9:25, then $\frac{DM+AL}{DM-AL}$ is equal to:

A 6

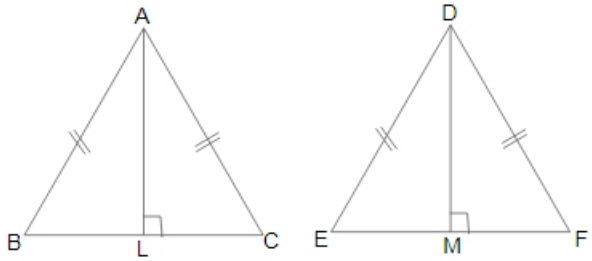
B 4

C 3

D 5

Answer: B

Explanation:



(area of △ ABC) : (area of △ DEF) = 9:25

By property of similar triangle,

$\frac{(DM)^2}{(AL)^2} = \frac{25}{9}$

$\frac{DM}{AL} = \frac{5}{3}$

By componendo dividendo,

When $\frac{x}{y} = \frac{a}{b}$ then,

$\frac{x+y}{x-y} = \frac{a+b}{a-b}$

So,

$\frac{DM+AL}{DM-AL} = \frac{5+3}{5-3}$

$\frac{DM+AL}{DM-AL} = \frac{8}{2} = 4$

Question 57

The given table represents the number of engineers recruited by four companies A, B, C and D over the years. Study the table carefully and answer the question that follows.

Company → / Year ↓	A	B	C	D
2014	120	90	85	105
2015	132	118	93	97
2016	128	98	94	100
2017	140	106	98	116
2018	148	112	105	125
2019	150	118	110	122

The number of the years in which the number of engineers recruited by company D is less than the average number of engineers recruited by B in the given six years,is:

A 3

B 1

C 4

D 2

Answer: A

Explanation:
Sum of the number of engineers recruited by B in the given six years = 90 + 119 + 98 + 106 + 112 + 118 = 643

Average number of engineers recruited by B in the given six years = 643/6 = 107.16

∴ 3 years (2014, 2015, 2016) in which the number of engineers recruited by company D is less than the average number of engineers recruited by B in the given six years

Question 58

The value of $\left(18 \div 2of\frac{1}{4}\right) \times \left(\frac{2}{3} \div \frac{3}{4} \times \frac{5}{8}\right) \div \left(\frac{2}{3} \div \frac{3}{4}of\frac{3}{4}\right)$ **is:**

A $10\frac{2}{3}$

B $8\frac{5}{8}$

C $16\frac{7}{8}$

D $2\frac{7}{64}$

Answer: C

Explanation:
$\left(18 \div 2of\frac{1}{4}\right) \times \left(\frac{2}{3} \div \frac{3}{4} \times \frac{5}{8}\right) \div \left(\frac{2}{3} \div \frac{3}{4}of\frac{3}{4}\right)$

$= \left(18 \div \frac{1}{2}\right) \times \left(\frac{2}{3} \div \frac{3}{4} \times \frac{5}{8}\right) \div \left(\frac{2}{3} \div \frac{9}{16}\right)$

$= 36 \times \left(\frac{2}{3} \times \frac{4}{3} \times \frac{5}{8}\right) \div \left(\frac{2}{3} \times \frac{16}{9}\right)$

$= 36 \times \frac{5}{9} \div \frac{32}{27}$

$= 36 \times \frac{5}{9} \times \frac{27}{32}$

$= 9 \times \frac{5}{9} \times \frac{27}{8}$ =135/8

$= 16\frac{7}{8}$

Question 59

If $2\sin\theta + 15\cos^2\theta = 7, 0° < \theta < 90°$, then $\tan\theta + \cos\theta + \sec\theta =$

A $3\frac{3}{5}$

B 3

C $3\frac{4}{5}$

D 4

Answer: A

Explanation:

$2\sin\theta + 15\cos^2\theta = 7$

$2\sin\theta + 15(1 - sin^2\theta) = 7$

$2\sin\theta + 15 - 15sin^2\theta = 7$

$2\sin\theta + 8 - 15sin^2\theta = 0$

$15sin^2\theta - 2\sin\theta - 8 = 0$

$sin^2\theta - \frac{2\sin\theta}{15} - \frac{8}{15} = 0$

$sin^2\theta + \frac{2\sin\theta}{3} - \frac{4\sin\theta}{5} - \frac{8}{15} = 0$

$sin\theta(sin\theta + \frac{2}{3}) - \frac{4}{5}(sin\theta + \frac{2}{3}) = 0$

$(sin\theta - \frac{4}{5})(sin\theta + \frac{2}{3}) = 0$

For $0° < \theta < 90°$,

$sin\theta = \frac{4}{5}$

Perpendicular = 4

Hypotenuses = 5

By triplet 3-4-5,

Base = 3

Now,

$\tan\theta + \cos\theta + \sec\theta$

$= \frac{4}{3} + \frac{3}{5} + \frac{5}{3}$

$= \frac{20+9+25}{15}$

$= \frac{54}{15} = \frac{18}{5}$

$= 3\frac{3}{5}$

Question 60

△ ABC is an equilateral triangle and AD ⊥ BC, where D lies on BC. If AD = $4\sqrt{3}$ cm, then what is the perimeter (in cm) of △ABC?

A 27

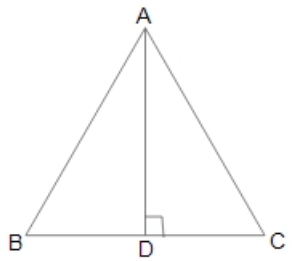
B 24

C 30

D 21

Answer: B

Explanation:



AD = $4\sqrt{3}$ cm

In right angle $\triangle$ ABD,

$(\because \angle D = 90^\circ)$

ByPythagoras,

$(AB)^2 = (AD)^2 + (BD)^2$

(AB = AC = BC)

(BD = BC/2 = AB/2)

$(AB)^2 - (BD)^2 = (AD)^2$

$(AB)^2 - (\frac{AB}{2})^2 = (4\sqrt{3})^2$

$\frac{3}{4}(AB)^2 = 48$

$(AB)^2 = 64$

AB = 8 cm

Perimeter of $\triangle ABC = 3 \times side = 3\times$ 8 = 24 cm

SSC CGL Tier-2 Previous Papers PDF

Question 61

PQRS is a cyclic quadrilateral in which PQ = x cm, QR= 16.8 cm, RS = 14 cm, PS = 25.2 cm, and PR bisects QS. What is the value of x ?

A 18

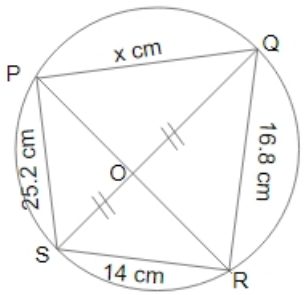
B 21

C 28

D 24

Answer: B

Explanation:



BY the property,

$PQ \times QR = RS \times PS$

$x \times 16.8 = 14 \times 25.2$

x = 352.8/16.8 = 21 cm

Question 62

If $\frac{\sec\theta - \tan\theta}{\sec\theta + \tan\theta} = \frac{3}{5}$**, then the value of** $\frac{\operatorname{cosec}\theta + \cot\theta}{\operatorname{cosec}\theta - \cot\theta}$ **is:**

A $24 + \sqrt{15}$

B $31 + 8\sqrt{15}$

C $27 + \sqrt{15}$

D $33 + 4\sqrt{15}$

Answer: B

Explanation:

$\frac{\sec\theta - \tan\theta}{\sec\theta + \tan\theta} = \frac{3}{5}$

Divide numerator and den. by $\tan\theta$,

$\frac{\operatorname{cosec}\theta - 1}{\operatorname{cosec}\theta + 1} = \frac{3}{5}$

Using componendo dividendo rule,

(if $\frac{p+q}{p-q} = \frac{a}{b} then \frac{p}{q} = \frac{a+b}{a-b}$)

cosec$$\theta = \frac{5 + 3}{5 - 3} = 4

$$cot^2\theta=cosec^2\theta-1$$

$\therefore \cot^2\theta = 4^2 - 1$

$\therefore \cot\theta = \sqrt{15}$

$\frac{cosec\theta + cot\theta}{cosec\theta - cot\theta} = \frac{4+\sqrt{15}}{4-\sqrt{15}}$

Rationalizing, we get

$= \frac{4+\sqrt{15}}{4-\sqrt{15}} \times \frac{4+\sqrt{15}}{4+\sqrt{15}}$

$= 31 + 8\sqrt{15}$

Question 63

The given table represents the number of engineers recruited by four companies A, B, C and D over the years. Study the table carefully and answer the question that follows.

Company → / Year ↓	A	B	C	D
2014	120	90	85	105
2015	132	118	93	97
2016	128	98	94	100
2017	140	106	98	116
2018	148	112	105	125
2019	150	118	110	122

The total number of engineers recruited by company A in 2014 to 2017 is what percentage more than the total number of engineers recruited by all four companies in 2019?

A 3

B 3.5

C 2.5

D 4

Answer: D

Explanation:

The total number of engineers recruited by company A in 2014 to 2017 = 120 + 132 + 128 + 140 = 520

The total number of engineers recruited by all four companies in 2019 = 150 + 118 + 110 + 122 = 500

Required percentage = $\frac{520-500}{500} \times 100 = \frac{20}{500} \times 100$ = 4%

Question 64

If x is the mean proportional between 12.8 and 64.8 and y is the third proportional to 38.4 and 57.6, then 2x : y is equal to:

A 2 : 3

B 4 : 5

C 3 : 4

D 1 : 2

Answer: A

Question 65

The average of the first four numbers is three times the fifth number. If the average of all the five numbers is 85.8, then the fifth number is:

A 33

B 34

C 39

D 29

Answer: A

Explanation:
Let the fifth number be x.

The average of the first four numbers = 3x

Sum of all the first four numbers = 3x $\times 4$ = 12x

The average of all the five numbers = 85.8

Sum of all the five numbers = 85.8 $\times$ 5 = 429

Sum of all the first four numbers + 5th number = 429

12x + x = 429

x = 429/13 = 33

$\therefore$ The 5th number is 33.

Question 66

Quadrilateral ABCD circumscribes circle. If AB = 8 cm, BC = 7 cm and CD = 6 cm,then the length of AD is:

A 6 cm

B 7.5 cm

C 7cm

D 6.8 cm

Answer: C

Explanation:
AB = 8 cm

BC = 7 cm

CD = 6 cm

By the property,

AB + CD = BC + AD

8 + 6 = 7 + AC

AC = 14 - 7 = 7 cm

Question 67

The expression $(a+b-c)^3+(a-b+c)^3-8a^3$ is equal to:

A $6a(a-b+c)(c-a-b)$

B $3a(a+b-c)(a-b+c)$

C $6a(a+b-c)(a-b+c)$

D $3a(a-b+c)(c-a-b)$

Answer: A

Explanation:
Let $(a+b-c)=A$, $(a-b+c)=B$ and $2a^3$ = C

$(a+b-c)^3+(a-b+c)^3-8a^3$

= $(A)^3+(B)^3-C^3$

$(a^3+\ b^3+c^3=3abc$ when a + b + c = 0)

So,

= -3ABC

$=-3(a+b-c)(a-b+c).2a^3$

$=6a^3(a+b-c)(c-a-b)$

Question 68

If $x^4+x^2y^2+y^4=21$ and $x^2+xy+y^2=7$, then the value of $\left(\frac{1}{x^2}+\frac{1}{y^2}\right)$ is:

A $\frac{5}{2}$

B $\frac{7}{4}$

C $\frac{5}{4}$

D $\frac{7}{3}$

Answer: C

Explanation:

$x^4+x^2y^2+y^4=21$

= $x^4+x^2y^2+y^4+\ x^2y^2\ -\ x^2y^2=21$

= $x^4+2x^2y^2+y^4-x^2y^2=21$

$(\because (a+b)^2=a^2+2ab+\ b^2)$

= $(x^2+\ y^2)^2=21+\ x^2y^2$ ----(1)

$x^2+xy+y^2=7$

$x^2+y^2=7-xy$ ---(2)

From eq(1) and (2),

$(7-xy)^2=21+x^2y^2$

$49+\ x^2y^2-14xy=21+\ x^2y^2$

14xy = 49 - 21

xy = 28/14 = 2

From eq(2),

$x^2+y^2=7-2$

$x^2+y^2=5$

Now,

$\left(\frac{1}{x^2}+\frac{1}{y^2}\right)$

= $\frac{x^2+y^2}{x^2y^2}$

= $\frac{5}{2^2}$

= $\frac{5}{4}$

Question 69

The given table represents the number of engineers recruited by four companies A, B, C and D over the years. Study the table carefully and answer the question that follows.

Company → / Year ↓	A	B	C	D
2014	120	90	85	105
2015	132	118	93	97
2016	128	98	94	100
2017	140	106	98	116
2018	148	112	105	125
2019	150	118	110	122

The total number of engineers recruited by company B in 2014 and 2017 is what percentage of the total number of engineers recruited by C during 2015 to 2019?

A 38.4

B 38.2

C 39.2

D 37.8

Answer: C

Explanation:
The total number of engineers recruited by company B in 2014 and 2017 = 90 + 106 = 196

Total number of engineers recruited by C during 2015 to 2019 = 93 + 94 + 98 + 105 + 110 = 500

Required percentage = $\frac{196}{500} \times 100$ = 39.2%

General Science Notes for SSC CGL

Question 70

The value of the expression $\text{cosec}(85^\circ + \theta) - \sec(5^\circ - \theta) - \tan(55^\circ + \theta) + \cot(35^\circ - \theta)$ **is:**

A $\frac{3}{2}$

B 0

C -1

D 1

Answer: B

Explanation:
$\text{cosec}(85^\circ + \theta) - \sec(5^\circ - \theta) - \tan(55^\circ + \theta) + \cot(35^\circ - \theta)$

= $\text{cosec}(85^\circ + \theta) - \sec(90 - (85^\circ + \theta)) - \tan(55^\circ + \theta) + \cot(90 - (55^\circ + \theta))$

= $\text{cosec}(85^\circ + \theta) - \text{cosec}(85^\circ + \theta) - \tan(55^\circ + \theta) + \tan(55^\circ + \theta)$

= 0

Question 71

When 200 is divided by a positive integer x , the remainder is 8. How many values of x are there?

A 7

B 5

C 8

D 6

Answer: C

Explanation:
When 200 is divided by a positive integer x , the remainder is 8.

For completely divisible by x, number = 200 - 8 = 192

Factor of 192 = $2^6 \times 3^1$

Total number = (6 + 1)(1 + 2) = 14

Number which are less then 9 = 1, 2, 3, 4, 6, 8

Total number of values = 14 -6 = 8

Question 72

If $x^2 - 3x + 1 = 0$, then what is the value of $x^6 + \frac{1}{x^6}$?

A 324

B 322

C 318

D 327

Answer: B

Explanation:
$x^2 - 3x + 1 = 0$

Divide both sides by x,

$x - 3 + \frac{1}{x} = 0$

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

On taking both sides cube,

$(x + \frac{1}{x})^3 = 3^3$

$x^3 + \frac{1}{x^3} + 3(x + \frac{1}{x}) = 27$

$(\because (a+b)^3 = a^3 + b^3 + 3ab(a+b))$

$x^3 + \frac{1}{x^3} + 3(3) = 27$

$x^3 + \frac{1}{x^3} = 18$

on taking square both sides,

$(x^3 + \frac{1}{x^3})^2 = 18^2$

$x^6 + \frac{1}{x^6} + 2 = 324$

$(\because (a+b)^2 = a^2 + b^2 + 2ab)$

$x^6 + \frac{1}{x^6} = 322$

Question 73

Anu fixes the selling price of an article at 25% above its cost of production. If the cost of production goes up by 20% and she raises the selling price by 10%, then her percentage profit is (correct to one decimal place):

A 16.4%

B 14.6%

C 13.8%

D 15.2%

Answer: B

Explanation:
Initially profit = 25%

Let the cost price be Rs.100.

Selling price = $100 \times \frac{125}{100}$ = 125

now,

Cost price = $100 \times \frac{120}{100}$ = Rs.120

Selling price = $125 \times \frac{110}{100}$ = Rs.137.5

Profit = 137.5 - 120 = 17.5

Profit percentage = $\frac{17.5}{120} \times 100$ = 14.6%

Question 74

A and B start moving towards each other from places X and Y, respectively, at the same time. The speed of A is 20% more than that of B. After meeting on the way, A and B take $2\frac{1}{2}$ hours and x hours, now to reach Y and X, respectively. What is the value of x ?

A $3\frac{3}{5}$

B $3\frac{2}{3}$

C $3\frac{1}{2}$

D $3\frac{2}{5}$

Answer: A

Explanation:
Let the speed of B be v.

Speed of A = 1.2v

Let the distance be d.

Relative speed = v + 1.2v = 2.2v

Time taken to meet = $\frac{d}{2.2v}$

Time taken by A to cover distance = $\frac{d}{2.2v} + 2\frac{1}{2} = \frac{d}{2.2v} + \frac{5}{2}$

$\frac{d}{1.2v} = \frac{d}{2.2v} + \frac{5}{2}$

$\frac{dv}{2.64v^2} = \frac{5}{2}$

$\frac{d}{v} = \frac{13.2}{2}$ ---(1)

Time taken by B to cover distance = $\frac{d}{2.2v} + x$

$\frac{d}{v} = \frac{d}{2.2v} + x$

$\frac{d}{v} - \frac{d}{2.2v} = x$

$\frac{1.2dv}{2.2v^2} = x$

$\frac{d}{v} = \frac{11x}{6}$

From eq(1),

$\frac{13.2}{2} = \frac{11x}{6}$

x = 3.6 = $\frac{36}{10} = 3\frac{3}{5}$

Question 75

A dealer marks an article 40% above the cost price and sells it to a customer, allowing two successive discounts of 20% and 25% on the marked price. If he suffers a loss of ₹ 140, then the cost price (in ₹) of the article is:

A 900

B 840

C 872

D 875

Answer: D

Explanation:
Let the cost price be x.

Marked price = x $\times \frac{140}{100}$ = 1.4x

Selling price = 1.4x $\times \frac{80}{100} \times \frac{75}{100}$ = 0.84x

Loss = 140

x - 0.84x = 140

0.16x = 140

x = Rs.875

∴ Cost price (in ₹) of the article is Rs.875.

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English Comprehension

Instructions
For the following questions answer them individually

Question 76

In the sentence identify the segment which contains the grammatical error.
The modern man is busy acquiring more and more wealth and designing ways to invest it in more sense pleasures.

A designing ways to invest it

B in more sense pleasures

C modern man is busy

D acquiring more and more wealth

Answer: B

Question 77

Select the most appropriate word to substitute the underlined word of the given sentence. If no substitution is required, select 'No improvement'.
There is a great degrade in values in modern age.

A degradation of values

B deliberation for values

C demonstration from values

D No improvement

Answer: A

Question 78

Select the most appropriate word to fill in the blank.
It is an _____ day to start your new business.

A audacious

B ominous

C auspicious

D occasional

Answer: C

Question 79

Select the synonym of the given word.
PATHETIC

A Pitiful

B Dull

C Insignificant

D Curious

Answer: A

Question 80

Select the antonym of the given word.
HILARIOUS

A Blithe

B Merry

C Sad

D Happy

Answer: C

Question 81

Select the correct indirect form of the given sentence.
He said to me, "What are you doing?"

A He said what I had been doing.

B He said that what I was doing

C He asked me what I was doing

D He asked me that what was I doing

Answer: C

Instructions

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

Comprehension:

Machines were made to be man's servants. Yet, man has grown so (1)_____ on them that they are in a fair way to become his (2)_____. Already men spend most of their lives looking after and waiting (3)_____ machines. Machines are very stern bosses. They must be fed with coal and (4)_____ petrol to drink and oil to wash with and must be kept at an (5)_____ temperature.

Question 82

Select the most appropriate option for blank no. 1

A subordinate

B dependent

C inferior

D helpless

Answer: B

Question 83

Select the most appropriate option for blank no. 2

A masters

B victims

C slaves

D administrators

Answer: A

Question 84

Select the most appropriate option for blank no. 3

A from

B upon

C under

D into

Answer: B

Question 85

Select the most appropriate option for blank no. 4

A given

B gives

C gave

D give

Answer: A

Question 86

Select the most appropriate option for blank no. 5

A outdated

B optimum

C optional

D optimist

Answer: B

Instructions

For the following questions answer them individually

Question 87

Given below are four jumbled sentences. Out of the given options pick the one that gives their correct order.
A. Can I borrow your camera?
B. I will give it back to you next week.
C. I am going to jungle safari tomorrow.
D. My friend told me that jungle is beautiful in these days

A CDAB

B BACD

C ADBC

D CADB

Answer: A

Question 88

Select one word for the following group of words.
One who leaves his own country to settle in another

A Foreigner

B Emigrant

C Tourist

D Native

Answer: B

Question 89

Select the wrongly spelt word.

A Practicle

B Flexible

C Flashy

D Elegant

Answer: A

Question 90

In the sentence identify the segment which contains the grammatical error.
The Prime Minister, along with the other ministers have left for America.

A for America

B The Prime Minister along with

C have left

D the other ministers

Answer: C

Question 91

Select the wrongly spelt word.

A Ostentasion

B Mansion

C Extension

D Persuasion

Answer: A

Question 92

Select the antonym of the given word.
VICIOUS

A Baneful

B Unfortunate

C Virtuous

D Sinful

Answer: C

Question 93

Select the most appropriate word to fill in the blank.
He _____ a heinous crime.

A happened

B committed

C made

D occurred

Answer: B

Question 94

Select the most appropriate meaning of the given idiom
On shank's mare

A On an elephant

B On a lion

C On a bicycle

D On foot

Answer: D

Question 95

Select the most appropriate meaning of the given idiom
A snake in the grass

A A well-wisher

B Difficult to find

C A good friend

D A secret enemy

Answer: D

Question 96

Select one word for the following group of words.
A period of ten years

A Fortnight

B Millennium

C Decade

D Century

Answer: C

Question 97

Select the synonym of the given word.
PENITENCE

A Patience

B Repentance

C Misery

D Admiration

Answer: B

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Question 98

Given below are four jumbled sentences. Out of the given options pick the one that gives their correct order.
A. Nevertheless, sound health, economic security and mental satisfaction are desired by all
B. A change that is conducive to happiness may be termed as progress.
C. But different people find happiness in different things.
D. So, If a change contributes to the growth of these factors, it is progress.

A BDCA

B ABCD

C BCAD

D DBCA

Answer: C

Question 99

Select the correct active form of the given sentence.
The thief was being arrested by the police.

A The police has arrested the thief

B The police arrested the thief.

C The police had arrested the thief.

D The police was arresting the thief.

Answer: D

Question 100

Select the most appropriate segment to substitute the underlined segment of the given sentence. If no substitution is required select 'No improvement'
A man in need pleaded for help .

A promised for help

B commanded to help

C No improvement

D requested for helping

Answer: C