Ssc Cgl Tier II Previous Year Question Paper Overview

Here, you can solve all the questions asked in Ssc Cgl Tier II Previous Year Question Paper on 2022-01-29 in the Morning exam. The detailed solutions are also provided for every previous year question and some of these questions can be asked again in your Ssc Cgl Tier II exam. There are 100 questions in the exam and 120 minutes are provided for the Ssc Cgl Tier II exam. The Cutoff of the exam was 140 marks hence you should try to score at least 150 marks.

Ssc Cgl Tier II Previous Year Question Paper : Questions and Solutions

Question 1 :
A loan is to be returned in two equal yearly installments. If the rate of interest is 10%p.a. compounded annually and each installment is Rs 5,808, then 60% of the total interest (nearest to a Rs) charged in this scheme is:

Difficulty : Moderate   **Average Time : 49 Seconds**

Options :
1. 913
2. 911
3. 917
4. 922

Solution :
The correct answer is **option 4** i.e. **922**

Here one can use the concept of future value,

Let the amount invested be P

$P = \frac{5808}{(1 + \frac{10}{100})} + \frac{5808}{(1 + \frac{10}{100})^2}$

P = 5280 + 4800

P= 10080

Interest earned = 11616 - 10080 = 1536

60% of 1536 = 921.6 = 922(approx)

Question 2 :

If the selling price of 7 articles is equal to the cost price of 8 articles, then what is the profit percentage (correct to one decimal place)?

Difficulty : Moderate

Average Time : 47 Seconds

Options :

1. 15.4%

2. 14.3%

3. 13.9%

4. 11.7%

Solution :

The correct answer is **option 2** i.e. **14.3%**

The selling price of 7 articles is equal to the cost price of 8 articles

SP of 7 articles = CP of 8 articles.

SP/CP = 8/7

Let SP = 8 units.

CP = 7 units

Profit = 1 units.

Profit% = 1/7 × 100 = 14.28% = 14.3%

Question 3 :

If $2x2 + 5x + 1 = 0$, then one of the values of $x - (rac{1}{2x})$is:

Difficulty : Moderate

Average Time : 43 Seconds

Options :

$\frac{√13}{2}$

2. $\frac{13}{2}$

3. $\frac{√17}{2}$

4. $\frac{5}{2}$

Solution :

The correct answer is **option 3** i.e. $\frac{√17}{2}$

$2x^2 + 5x + 1 = 0$

On dividing the above equation by 2x we get,

x + 5/2 + 1/2x = 0

x + 1/2x = -5/2

As we know that,

$(a - b)^2 = (a + b)^2 - 4ab$

$(x - 1/2x)^2 = (x + 1/2x)^2 - 4 × x × 1/2x.$

$(x - 1/2x)^2 = -5/2 × -5/2 - 2$

$(x - 1/2x) = \frac{√17}{2}$.

Question 4 :

A started a business with a capital of Rs 54,000 and admitted B and C after 4 months and 6 months, respectively. At the end of the year, the profit was divided among the three in the ratio 1 : 4 : 5. What is the sum (in rs) of the capitals invested by B and C?

Difficulty : Moderate   **Average Time : 68 Seconds**

Options :
1. 8,60,400

2. 8,64,000

3. 8,40,000

4. 8,46,000

Solution :

The correct answer is **option 2** i.e. **8,64,000**

Let the amount invested by B and C be x and y.

	A	B	C
Investment	54000	x	y
Time - period	12	8	6
Profit share	1	4	5

54000 × 12 = 1 units.

1 unit = 648000

B's profit share = 4 units

4 units = 8 × x

4 × 648000 = 8 × x

x = 324000

5 units = 6 × y

5 × 648000 = 6 × y

y = 540000

x + y = 324000 + 540000 = 864000.

Question 5 :
The volume of a solid hemisphere is 19,404 cm3. Its total surface area (in cm2) is: (Take $= \frac{22}{7}$))

Difficulty : Moderate

Average Time : 65 Seconds

Options :
1. 2772
2. 3465
3. 2079
4. 4158

Solution :

The correct answer is **option 4** i.e. **4158**

The volume of hemisphere = $2/3 \times r^3$

$2/3 \times r^3 = 19404$

$2/3 \times 22/7 \times r^3 = 19404$

r = 21

Total surface area of hemisphere = $3r^2$.

= $3 \times 22/7 \times 21 \times 21 = 4158$.

Question 6 :

If 2x - y = 2 and xy = (rac{3}{2}), then what is the value of x3 - y3/8?

Difficulty : Moderate   **Average Time : 44 Seconds**

Options :

1. \(\frac{5}{2}\)

2. \(\frac{13}{4}\)

3. \(\frac{9}{2}\)

4. -\(\frac{5}{4}\)

Solution :

The correct answer is **option 2** i.e. \(\frac{13}{4}\)

2x - y = 2

On dividing by 2 we get,

x - y/2 = 1

cubing on both sides, we get,

$x^3 - y^3/8 - (3xy/2)(x - y/2) = 1^3$

$x^3 - y^3/8 - 3/2 \times 3/2 \times 1 = 1$

$x^3 - y^3/8 - 9/4 = 1$

$x^3 - y^3/8 = 13/4$.

Question 7 :

The value of 0.46Ì + 0.72Ì 3Ì - 0.39Ì × 0.7Ì is:

Difficulty : Moderate

Average Time : 55 Seconds

Options :

1. 0.9Ì 7Ì
2. 0.7Ì 7Ì
3. 0.5Ì 7Ì
4. 0.8Ì 7Ì

Solution :

The correct answer is **option 4** i.e. **0.8Ì 7Ì**

The simplest form of 0.46Ì = (46 - 4)/90 = 7/15

The simplest form of 0.72Ì 3Ì = (723 - 7)/990 = 358/495

Similarly,

0.39Ì = (39 - 3)/90 = 2/5

0.7Ì = 7/9

On putting the respective values we get,

7/15 + 358/495 - 2/5 × 7/9 = 435/495

On dividing we get, 0.8787878787..............

Which can be written as **0.8Ì 7Ì .**

Question 8 :

In â—³ABC, A = 60⁰ and B = 50⁰. If the bisector of B and C meet at P, then BPC - PCA =?
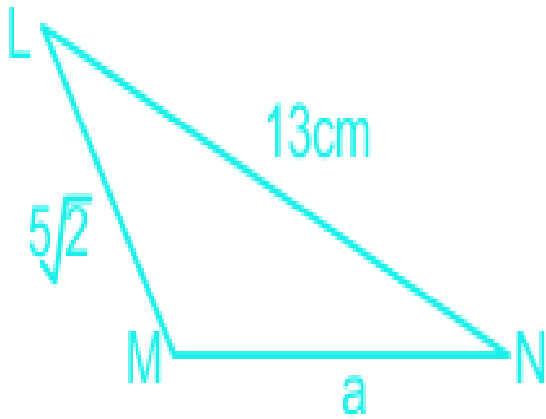
Difficulty : Moderate

Average Time : 51 Seconds

Options :

1. 93⁰
2. 81⁰
3. 85⁰
4. 83⁰

Solution :

The correct answer is **option 3** i.e. **85º**

BPC= 90 + 1/2 × A

BPC = 90 + 30 = 120°

PBA = 1/2 × B

PBA = 1/2 × 50 = 25°

PCA = 180 - 120 - 25 = 35°

Required difference = 120 - 35 = **85°.**

Question 9 :
The base of the right pyramid is an equilateral triangle, each side of which is 20 cm. Each slant edge is 30 cm. The vertical height (in cm) of the pyramid is:
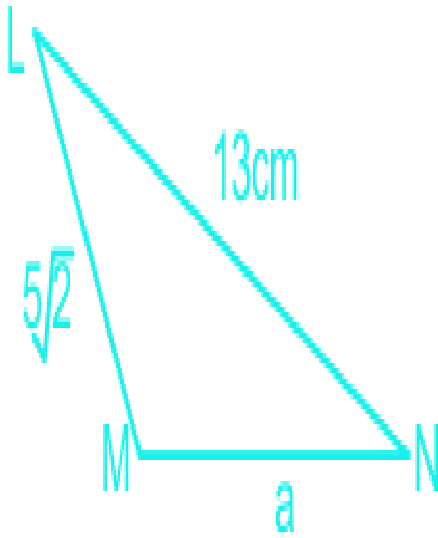
Difficulty : Moderate

Average Time : 53 Seconds

Options :

1. 103

2. $5\sqrt{\frac{23}{3}}$

3. 53

4. $10\sqrt{\frac{23}{3}}$

Solution :

The correct answer is **option 4** i.e. $10\sqrt{\frac{23}{3}}$

PQ is perpendicular to BQ.

BQ is the circum radius of the equilateral triangle,

BQ = a/$\sqrt{3}$

BQ = 20/$\sqrt{3}$.

PQ = $\sqrt{30^2 - \frac{20}{\sqrt{3}}^2}$ = $\sqrt{\frac{2300}{3}}$ = 10$\sqrt{\frac{23}{3}}$.

Question 10 :
If 847 × 385 × 675 × 3025 = 3a × 5b × 7c × 11d, then the value of ab - cd is:

Difficulty : Moderate   **Average Time : 61 Seconds**

Options :

1. 5

2. 4

3. 1

4. 7

Solution :

 The correct answer is **option 1** i.e. **5**

847 × 385 × 675 × 3025 = 3^a × 5^b × 7^c × 11^d

Price factorization of 847 = 7 × 11^2

$385 = 5 \times 7 \times 11$

$675 = 3^3 \times 5^2$

$3025 = 5^2 \times 11^2$

On combining we get,

$3^3 \times 5^5 \times 7^2 \times 11^5 = 3^a \times 5^b \times 7^c \times 11^d$

On comparing we get,

$a = 3, b = 5, c = 2$ and $d = 5$

$ab - cd = 15 - 10 = 5.$

Question 11 :
A discount of 10% is offered on the price of an article if the payment is made online. An additional discount of 5% is given to credit card holders. A person wishes to buy a watch priced at Rs 60,000 by paying online through credit card. How much does he need to pay (in Rs)?

Difficulty : Moderate   **Average Time : 70 Seconds**

Options :

1. 62,150

2. 61,250

3. 53,100

4. 51,300

Solution :
 The correct answer is **option 4** i.e. **51,300**

Overall discount = x + y + xy/100

Overall discount = -10 -5 × (-10 × -5)/100

= -15 + 1/2 = -14.5 (negative sign shows that it is a discount)

Overall discount offered = 14.5%

CP of the watch for a person = 60000 × 85.5% = 51300.

Question 12 :

If $1 + 2\tan^2 + 2\sin\sec^2 = \frac{a}{b}$, 0° 90°, then $\frac{a+b}{a-b} = ?$

Difficulty : Moderate

Average Time : 45 Seconds

Options :

1. sin
2. cosec
3. cos
4. sec

Solution :

The correct answer is **option 2** i.e. **cosec**

$1 + 2\tan^2 + 2\sin\sec^2 = a/b$

$1 + 2 \times \sin^2/\cos^2 + 2 \times \sin/\cos^2 = a/b$

$(\cos^2 + 2\sin^2 + 2\sin)/\cos^2 = a/b$

$(1 - \sin^2 + 2\sin^2 + 2\sin)/\cos^2 = a/b$

$(1 - \sin)^2/(1 - \sin^2) = a/b$

$(1 + \sin)/(1 - \sin) = a/b$

$a = 1 + \sin$ and $b = 1 - \sin$

$(a + b)/(a - b) = 2/2\sin = \csc.$

Question 13 :

If $\frac{22\sqrt{2}}{4\sqrt{2}-\sqrt{3}+\sqrt{5}} = a + 5b$, with $a, b > 0$, then what is the value of $(ab) : (a+b)$?

Difficulty : Moderate

Average Time : 69 Seconds

Options :

1. 4 : 7
2. 8 : 7
3. 7 : 4
4. 7 : 8

Solution :

The correct answer is **option 4** i.e. **7 : 8**

$\frac{22 \sqrt2}{4\sqrt3-\sqrt3+\sqrt5}= a + 5b$

On rationalizing the LHS part we get,

$\frac{22 \sqrt2}{4\sqrt2-\sqrt3+\sqrt5}= a + 5b$

$\frac{22 \sqrt2 \times(4\sqrt2-\sqrt3-\sqrt5)}{(4\sqrt2-\sqrt3+\sqrt5)(4\sqrt2-\sqrt3-\sqrt5)}$

$\frac{2(88 - 11\sqrt6 - 11\sqrt{10}}{2(15 - 4 \sqrt6)}$

Again on rationalization, we get,

$\frac{(88 - 11\sqrt6 - 11\sqrt{10}}{(15 - 4 \sqrt6)} \times \frac{15 + 4\sqrt6}{15 + 4\sqrt6}$.

Question 14 :

A student goes to school at a speed of 5½km/h and returs at a speed of 4 km/h. If he takes 4¾hours for his entire journey, then the total distance covered by the student (in km) is:

Difficulty : Moderate

Average Time : 68 Seconds

Options :

1. 16

2. 22

3. 24

4. 11

5. 18

Solution :

The correct answer is **option 2** i.e. **22**

Here distance is constant so one can use the direct formula for finding average speed.

2ab/(a + b) = (2 × 11/2 × 4)/(11/2 + 4) = 44/(19/2)

= 88/19 km/hr.

Distance travelled = 88/19 × 19/4 = 22km.

Question 15 :

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Study the given pie charts and answer the question that follows. The number of students who passed the examinationfrom institute D exceeds the number of students who appeared from institute A is x. The value of x lies between:

Difficulty : Moderate

Average Time : 48 Seconds

Options :

1. 14 and 17

2. 8 and 11

3. 11 and 14

4. 5 and 8

Solution :

The correct answer is **option 3** i.e. **11 and 14**

Institutes	Appeared	Passed
A	240	135
B	180	162
C	300	270
D	350	252
E	130	81

x = 252 - 240 = 12

x = 12.

Question 16 :

A sum of money becomes Rs 11, 880 after 4 years and Rs 17,820 after 6 years on compound interest, if the interest is compounded annually. What is the half of the sum (in Rs)?

Difficulty : Moderate

Average Time : 55 Seconds

Options :

1. 2,410

2. 2,750

   2,530

4. 2,640

Solution :

The correct answer is **option 4** i.e. **2,640**

According to the question,

$17820 = P(1 + r/100)^6$ ....(1)

$11880 = P(1 + r/100)^4$ ....(2)

(2) ÷ (1) we get,

$3/2 = (1 + r/100)^2$ ....(3)

On putting the value of (3) in (2) we get,

$17820 = P(3/2)^3$

$P = 5280$

Half of 5280 = 2640.

Question 17 :

Study the given graph and answer the question that follows. The total production of fertilizers by country Y in 2017 and 2019 and by country X in 2016 is what percentage of the total production of fertilizers by country Z in 2016,2018 and 2020?

Difficulty : Moderate

Average Time : 51 Seconds

Options :

1. 77%

2. 70%

3. 60%

4. 69%

Solution :

The correct answer is **option 2** i.e. **70%**

The total production of fertilizers by country Y in 2017 and 2019 and by country X in 2016 = 265 + 285 + 220 = 770.

The total production of fertilizers by country Z in 2016,2018 and 2020 = 320 + 360 + 420 = 1100.

Required % = 770/1100 × 100 = 70%.

Question 18 :
Study the histogram and answer the question that follows: The number of persons weighing 55 kg or more but less than 75kg is what percentage more than the number of persons weighing 80kg or more but less than 100kg (correct to one decimal place)?

Difficulty : Moderate   **Average Time : 47 Seconds**

Options :
1. 88.2%
2. 77.8%
3. 68.4%
4. 66.7%

Solution :
 The correct answer is **option 2** i.e. **77.8%**

The number of persons weighing 55 kg or more but less than 75kg = 160

The number of persons weighing 80kg or more but less than 100kg = 90

Required % = (160 - 90)/90 × 100 = 77.8%.

Question 19 :
The slant height and radius of a right circular cone are in the ratio 29 : 20. If its volume is 4838.4 cm3, then its radius is:

Difficulty : Moderate   **Average Time : 42 Seconds**

Options :
1. 24 cm
2. 20 cm
3. 25 cm
4. 28 cm

Solution :

The correct answer is **option 1** i.e. **24 cm**

Let the slant height and radius be 29x and 20x.

Height = $\sqrt{(29x)^2 - (20x)^2}$

h = 21x

The volume of cone = 1/3 × × r^2 × h = 4838.4.

14515.2 = 20x × 20x × 21x

x^3 = 1.728

x = 1.2

Radius = 20x = 20 × 1.2 = 24 cm.

Question 20 :
If x2 - 7x + 1 = 0, then what is the value of x5 + (rac{1}{x^5})?

Difficulty : Moderate   **Average Time : 49 Seconds**

Options :

1. 217

2. 257

3. 197

4. 277

Solution :

The correct answer is **option 3** i.e. **197**

x^2 - 7x + 1 = 0

On dividing by x on both sides we get,

x - 7 + 1/x = 0

x + 1/x = 7.........(1)

on squaring both sides we get,

x^2 + 1/x^2 = 7 - 2

$x^2 + 1/x^2 = 5$.........(3)

On cubing both sides in equation 1 we get,

$x^3 + 1/x^3 + 3(x + 1/x) = 77$.

$x^3 + 1/x^3 = 47$...........(4)

Now lets multiply (3) with (4) we get,

$x^5 + 1/x^5 + x + 1/x = 207$

$x^5 + 1/x^5 = 207 - 7 = 197$.

Question 21 :
ABCD is a cyclic quadrilateral and BC is the diameter of the circle. If DBC = 29º, then BAD = ?
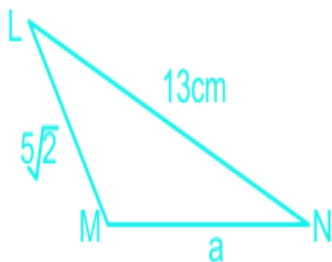
Difficulty : Moderate

Average Time : 72 Seconds

Options :

1. 122º

2. 119º

3. 129º

4. 111º

Solution :
The correct answer is **option 2** i.e. **119º**

One knows that the angle in a semicircle is equal to 90°.

BDC = 90°.

BCD = 180 - 90 -29 = 61°.

The sum of the opposite angle in a cyclic quadrilateral is 180 °

BAD + BCD =180°

BAD = 180 - 61 = 119°.

Question 22 :

The monthly expenses of a person are 66(rac{2}{3})% more than her monthly savings. If her monthly income increases by 44% and her monthly expenses increase by 60%, then there is an increase of Rs1,040 in her monthly savings. What is the initial expenditure (in Rs)?

Difficulty : Moderate

Average Time : 59 Seconds

Options :

1. 13,000
2. 10,000
3. 12,000
4. 9,000

Solution :

The correct answer is **option 2** i.e. **10,000**

66$\frac{2}{3}$% more = 2/3

It ,means, if the saving are Rs3 then the expenditures are (3 + 2) = 5

Let the savings = 300x

Expenditure = 500x

So income = 300x + 500x = 800x

Income increased by 44%

So monthly income = 800 × 144/100 = 1152x

Expenditure increased by 60% = 500x × 160/100 = 800x

Savings = 1152x - 800x = 352x.

Increase in the savings = 352x - 350x = 52x

52x = 1040

x = 20

Expenditures = 500 × 20 = 10000.

Question 23 :

Two pipes A and B can fill a cistern in 12½hours and 25 hours, respectively. The pipes were opened simultaneously, and it was found that, due to leakage in the bottom, it took one hour 40 minutes more to fill the cistern. if the cistern is full, in how much time(in hours) will the leak alone empty 70% of the cistern?

Difficulty : Moderate   **Average Time : 64 Seconds**

Options :

1. 30
2. 50
3. 40
4. 35

Solution :

 The correct answer is **option 4** i.e. **35**

A fill the tank in 25/2 hours.

B fill the tank in 25 hours.

Total work = LCM of (25/2, 25)

Total work = 625.

The efficiency of Pipe A = 50 units/ hour

The efficiency of Pipe B = 25 units/hour

Both A and B can fill the tank in 625/75hours = 8 hours 20 minutes.

Due to the leakage, the work is now completed in 8 hours 20 minutes + 1 hour 40 minutes.

Total time taken = 10 hours.

Let the efficiency of leakage be x

(50 + 25 - x) × 10 = 625

x = 12.5 units/hour.

70% of 625 = 437.5

Time taken by leakage to empty 437.5 units of water = 437.5/12.5 = 35 hours.

Question 24 :

A sum of Rs 46,800 is divided among A, B , C and D in such a way that the ratio of the combined share of A and D to the combined share of B and C is 8 : 5. The ratio of the share of B to that of C is 5 : 4. A receives Rs 18,400. If x is the difference between the shares of A and B and y is the difference between the shares of C and D, then what is the value of (x-y)(in Rs)?

Difficulty : Moderate

Average Time : 79 Seconds

Options :

1. 6000

2. 6500

3. 5000

4. 7000

Solution :

The correct answer is **option 1** i.e. **6000**

B : C = 5 : 4....(1)

B + C = 5x + 4x = 9x

(A + D) : (B + C) = (8 : 5)

To make B + C equal in both the scenarios, multiply the (2) equation by 9 and (1) equation by (1) we get,

(A + D) : (B + C) = 72 : 45

B : C = 25 : 20

A + B + C + D = 46800

72x + 45x = 46800

117x = 46800

x = 400.

72x = 72 × 400 = 28800.

A + D = 28800

D's share = 28800 - 18400 = 10400.

B's share = 25x = 25 × 400 = 10000

C's share = 20x = 20 × 400 = 8000.

x = A - B = 18400 - 10400 = 8000

y = 10000 - 8000 = 2000.

x - y = 8000 - 2000 = 6000.

Question 25 :

The ratio of the distance between two places A and B to the distance between places B and C is 3 : 5. A man travels from A to B at a speed of x km/h and from B to C at a speed of 50 km/h. If his average speed for the entire journey is 40km/h, then what is the value of (x-10):(x+1)?

Difficulty : Moderate   **Average Time : 73 Seconds**

Options :

1. 20 : 31
2. 31 : 20
3. 10 : 11
4. 11 : 10

Solution :

 The correct answer is **option 1** i.e. **20 : 31**

Average speed = (total distance)/(total time)

Let the distance between A and B and B and C be 3a and 5a.

Total distance = 3a + 5a = 8a.

Total time = 3a/x + 5a/50

According to the question,

40 = (8a)/(3a/x + 5a/50)

40ax = 600a + 20ax

x = 30

(x - 10) : (x + 1) = 20 : 31.

Question 26 :

Alloy A contains metals x and y only in the ratio 5 : 2, while alloy B contains them in the ratio 3 ; 4. Alloy C is prepared by

mixing alloys A and B in the ratio 4 : 5. The percentage of x in alloy C is:

Difficulty : Moderate

Average Time : 55 Seconds

Options :

1. $55\frac{1}{9}$
2. $55\frac{4}{9}$
3. $55\frac{2}{9}$
4. $55\frac{5}{9}$

Solution :

The correct answer is **option 4** i.e. $55\frac{5}{9}$

The ratio of the Component of x and y in A = 5 : 2 = 7 units.

The ratio of the Component of x and y in B = 3 : 4 = 7 units.

A and B is mixed in the ratio of 4 : 5

In 4 times of A, component of x and y in A becomes = 20 : 8

in 5 times of B, component of x and y in B becomes = 15 : 20

In C, the ratio of the component of x and y = 20 + 15 : 8 + 20 = 35 : 28

Ratio of component of x and y in C = 5 : 4

% of x in C = 5/9 × 100 = 55.55% = $55\frac{5}{9}$%.

Question 27 :
The curved surface area and the volume of a cylindrical object are 88 cm2 and 132 cm2, respectively. The height (in cm) of the cylindrical object is: (Take = $\frac{22}{7}$))

Difficulty : Moderate

Average Time : 69 Seconds

Options :

1. 6
2. $4\frac{2}{3}$
3. $3\frac{2}{3}$
4. 4

Solution :

The correct answer is **option 2** i.e. $4\frac{2}{3}$

Here Volume of the cylindrical figure = r^2h = 132............(1)

Curved surface area = 2rh = 88...........(2)

On dividing equation (1) by (2) we get,

r/2 = 132/88

r = 3.

r^2h = 132

22/7 × 3 × 3 × h = 132

h = 14/3 = $4\frac{2}{3}$.

Question 28 :

In an examination, the average marks of a student per paper were 71. If he would have obtained 35 more marks in sciences; 11 more marks in history and 4 more marks in computer science, his average marks per paper would have been 76. How many papers were there in the examination?

Difficulty : Moderate   **Average Time : 59 Seconds**

Options :

1. 18

2. 12

3. 10

4. 15

Solution :

The correct answer is **option 3** i.e. **10**

Let there are n papers.

Sum of scores in 'n' papers = n × 71 = 71n

After increment of scores, sum of scores in 'n' papers = 71n + 35 + 11 + 4 = 71n + 40.

Average becomes = 76

(71n + 50)/n = 76

71n + 50 = 76n

5n = 50

n = 10.

Question 29 :

If a 10-digit number 75462A97B6 is divisible by 72, then the value of (sqrt{8A-4B})is:

Difficulty : Moderate   **Average Time : 45 Seconds**

Options :

1. 21

2. 27

3. 28

4. 30

Solution :

The correct answer is **option 3** i.e. **28**

75462A97B6 is divisible by 2

Co - prime factors of 72 = 9 and 8.

75462A97B6 is divisible by 8, which means 7B6 is divisible by 8.

The possible value of b at which 7B6 is divisible by 8 is 3 and 7.

If 75462A97B6 is divisible by 9 then the sum of the digits of 75462A97B6 is also divisible by 9

7 + 5 + 4 + 6 + 2 + A + 9 + 7 + B + 6 = 45 + 1 + A + B.

A + B + 1 must be divisible by 9,

At B = 3 possible value of A is 5

At B = 7 No value of A is possible.

$\sqrt{8A-4B}$ = $\sqrt{40 - 12} = \sqrt{28}$.

Question 30 :

ABCD is a quadrilateral in which AB||DC. E and F are the midpoints of the diagonals AC and BD, respectively. If AB = 18cm and CD = 6 cm, then EF=?

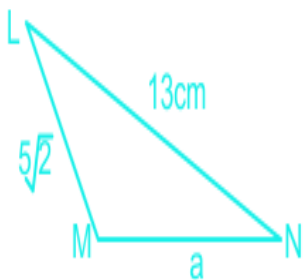**Difficulty : Moderate**

Average Time : 67 Seconds

Options :

1. 8 cm

2. 9 cm

3. 6 cm

4. 12 cm

Solution :

The correct answer is **option 3** i.e. **6 cm**

ABCD is a trapezium and EF || AB || DC then one can directly use a formula as,

EF = 1/2 × (Difference of parallel sides)

EF = 1/2 × (18 - 6)

EF = 12/2 = 6cm.

Question 31 :

AB and CD are two chords in a circle with centre O and AD is a diameter. AB and CD produced meet at a point P outside the circle. If APD = 25⁰ and DAP = 39⁰, then the measure of CBD is:

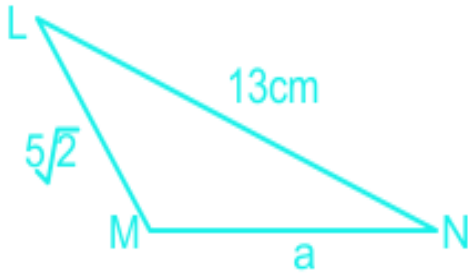**Difficulty : Moderate**

Average Time : 55 Seconds

Options :

1. 29⁰

2. 27⁰

26⁰

4. 32⁰

Solution :

The correct answer is **option 3** i.e. **26⁰**

ADC = 25 + 39 = 64° (Exterior angle sum property)

ADC = ABC = 64° (Angle on the same segment)

AD is the diameter here,

ABD = 90°

CBD = 90 - 64 = 26°.

Question 32 :
The ratio of the incomes of A and B in the last year was 4 : 3. The ratios of their individual incomes in the last year and the present year are 3 : 4 and 5 : 6, respectively. If their total income in the present year is Rs 24.12 lakhs, then the sum of the income (in lakhs) of A in the last year and that of B in the present year is:

Difficulty : Moderate   **Average Time : 60 Seconds**

Options :

1. 22.17

2. 21.28

3. 20.52

4. 10.98

Solution :
The correct answer is **option 3** i.e. **20.52**

Question 33 :

In â–³ABC, O is the point of intersection of the bisectors of B and A. If BOC = 108⁰, then BAO =?
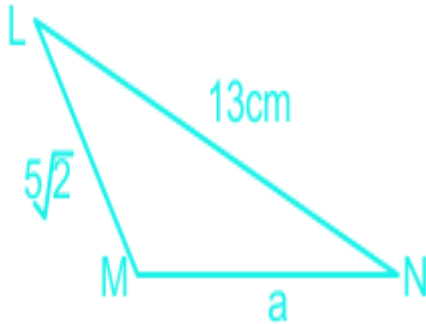
Difficulty : Moderate

Average Time : 34 Seconds

Options :

1. 27⁰

2. 18⁰

3. 40⁰

4. 36⁰

Solution :

The correct answer is **option 2** i.e. **18⁰**

According to the angle bisector theorem,

BOC = 90 + 1/2 × A

A = 18 × 2 = 36°

BAO = 1/2 of A

BAO = 18°

Question 34 :

A, B and C invested their capitals in the ratio 2 : 3 : 5. The ratio of months for which they invested is 4 : 2 : 3, respectively. If the difference between the profit shares of A and B is Rs 1,86,000, then C's share of profit (in Rs) is:

Difficulty : Moderate

Average Time : 53 Seconds

Options :

1. 15,39,000

   19,35,000

3. 13,95,000

4. 10,29,500

Solution :

The correct answer is **option 3** i.e. **13,95,000**

One knows that,

Profit share = Amount Invested × Time period.

The ratio of the profit share of A, B and C is,

A : B : C = 2x × 4y : 3x × 2y : 5x × 3y

A : B : C = 8xy : 6xy : 15xy

According to the question,

8xy - 6xy = 186000

2xy = 186000

xy = 93000

C's profit share = 15xy

= 15 × 93000 = **13,95,000.**

Question 35 :
The graphs of the equations $4x+\frac{1}{3}y=\frac{8}{3}$ and $\frac{1}{2}x+\frac{3}{4}y+\frac{5}{2}=0$ intersect at a point P. The point P also lies on the graph of the equations:-

Difficulty : Moderate

Average Time : 57 Seconds

Options :

1. x + 2y - 5 = 0

2. 3x - y - 7 = 0

3. x - 3y - 12 = 0

4. 4x - y + 7 =0

Solution :

The correct answer is **option 2** i.e. **3x - y - 7 = 0**

$4x+\frac{1}{3}y=\frac{8}{3}$ can be written as 12x + y = 8...........(1)

$\frac{1}{2}x+\frac{3}{4}y +\frac{5}{2}=0$ can be written as 2x + 3y = -10 ....(2)

on solving eq (1) and (2) we get,

x = 1and y = -4

(1,-4) satisfy the equation in option 2.

So one can say that , 3x - y - 7 = 0 will be the line which passes through (1, -4).

-

Question 36 :

In 6 minutes, $(\frac{4}{13})$of the bucket is filled. How much time will it take to fill the remaining bucket?

Difficulty : Moderate   Average Time : 62 Seconds

Options :

1. 14 minutes 30 seconds

2. 11 minutes 30 seconds

3. 13 minutes 30 seconds

4. 12 minutes 30 seconds

Solution :

The correct answer is **option 3** i.e. **13 minutes 30 seconds**

Suppose the total work here is 13 units

6 minutes 4 units

1 minute 4/6 units

Remaining work = 13 - 4 = 9 units.

Time is taken to completely fill the remaining part of the bucket = $\frac{9}{\frac23}$ = 13 minutes 30 seconds.

Question 37 :

An article was sold for Rs. 716 after offering a discount of 10.5%. If a discount of 6.5% is given, then for how much (in Rs)

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should it be sold?

Difficulty : Moderate   **Average Time : 52 Seconds**

Options :

1. 732

2. 675

3. 756

4. 748

Solution :

The correct answer is **option 4** i.e. **748**

Let the Marked price be 100x

Price of an article if there is no discount,

10.5% of 100x = 10.5x

Selling price = 716

89.5x = 716

x = 716/89.5

x = 8

MP = 100 × 8 = 800

Selling price of an item if there is a discount of 6.5%

800 × (100 - 6.5)\100 = 748

Question 38 :

G is centroid of a triangle ABC, whose sides AB = 35 cm BC = 12 cm, and AC = 37 cm. The length of BG is (correct to one decimal place).

Difficulty : Moderate   **Average Time : 49 Seconds**
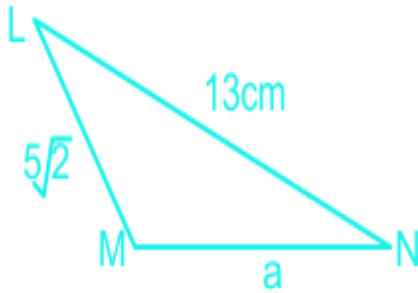
Options :

1. 11.7 cm

2. 12.3 cm

17.5 cm

4. 12.9 cm

Solution :
The correct answer is **option 2** i.e. **12.3 cm**

12 - 35 - 37 is a Pythagorean triplet.

37 is the hypotenuse here.

BD = CD = AD = 37/2

BG = 2/3 of 37/2

BG = **12.33 cm.**

Question 39 :
Study the given graph and answer the question that follows. What is the ratio of the total production of fertilizers by country X in 2017 and country Y in 2020 to the production of fertilizers by country Z in 2019?

Difficulty : Moderate

Average Time : 51 Seconds

Options :

1. 27 : 20

2. 3 : 2

3. 4 : 3

4. 19 : 12

Solution :
The correct answer is **option 2** i.e. **3 : 2**

The total production of fertilizers by country X in 2017 and country Y in 2020 = 236 + 334 = 570

Page No: 30

The production of fertilizers by country Z in 2019 = 380

Required ratio = 570 : 380 = **3 : 2.**

Question 40 :

Let x = (rac{5rac{3}{4} imes 15rac{3}{4}+2rac{2}{35}div1rac{11}{25}}{rac{3}{4}div1rac{1}{4}+5rac{3}{5}div3rac{4}{15}}). When y is added to x, the result is (rac{7}{13}). What is the value of y?

Difficulty : Moderate   **Average Time : 43 Seconds**

Options :

1. $\frac{1}{13}$

2. $\frac{4}{13}$

3. $\frac{2}{13}$

4. $\frac{9}{13}$

Solution :

The correct answer is **option 2** i.e. $\frac{4}{13}$

x = $\frac{5 \frac{3}{4}-\frac{3}{7} \times 15 \frac{3}{4}+2 \frac{2}{35} \div 1 \frac{11}{25}}{\frac{3}{4} \div 5 \frac{1}{4}+5 \frac{3}{5} \div 3 \frac{4}{15}}$

= (23/4 - 3/7 × 63/4 + 72/35 ÷ 36/25)/(3/4 ÷ 21/4 + 28/5 ÷ 49/15)

= (-1 + 10/7)/(13/7)

x = 3/13

y + x = 7/13

y = 7/13 - 3/13 = **4/13.**

Question 41 :

Study the given pie charts and answer the question that follows. Which institute has the second highest percentage of students who passed to the students who appeared from that institute?

Difficulty : Moderate   **Average Time : 53 Seconds**

Options :

1. D

2. B

C

4. E

Solution :

The correct answer is **option 1** i.e. **D**

Institutes	Appeared	Passed
A	240	135
B	180	162
C	300	270
D	350	252
E	130	81

Required% for A = 135/240 × 100 = 56.25%

Required% for B = 162/180 × 100 = 90%

Required% for C = 270/300 × 100 = 90%

Required% for D = 252/350 × 100 = 72%

Required% for E = 81/130 × 100 = 62.30%

One can observe that Institute D has the second-highest %.

Question 42 :

A covered a distance of 240 km at a certain speed. had his speed been 8 km/h less, then the time taken would have been an hour more for covering the same distance, How much time (in hours) will he take to cover a distance of 480 km at his original speed?

Difficulty : Moderate

Average Time : 70 Seconds

Options :

1. 8

2. 10

3. 11

9

5. 12

Solution :

The correct answer is **option 2** i.e. **10**

Let the initial speed be x km/hr

240/(x - 8} - 240/x = 1

On solving further we get,

x^2 - 8x - 1920 = 0

x^2 - 48x + 40x - 1920 = 0

x(x - 48) + 40(x - 48) = 0

(x - 48)(x + 40) = 0

x = 48, -40

Time taken by A to cover a distance of 480 at the speed of 48 km/hr

= 480/48 = 10 hours.

Question 43 :
The value of (rac{4 tan^2 30^0 + sin^2 30^0 cos^2 45^0 + sec^2 48^0 - cot^2 42^0}{cos37^0sin53^0 + sin37^0cos53^0+tan18^0tan72^0}) is:

Difficulty : Moderate

Average Time : 55 Seconds

Options :

1. $\frac{49}{24}$

2. $\frac{35}{48}$

3. $\frac{35}{24}$

4. $\frac{59}{48}$

Solution :

The correct answer is **option 4** i.e. $\frac{59}{48}$

$\frac{4 \tan ^{2} 30^{\circ}+\sin ^{2} 30^{\circ} \cos ^{2} 45^{\circ}+\sec ^{2} 48^{\circ}-\cot ^{2} 42^{\circ}}{\cos 37^{\circ} \sin 53^{\circ}+\sin 37^{\circ} \cos 53^{\circ}+\tan 18^{\circ} \tan 72^{\circ}}$ = $\frac{\frac{4}{3}+\frac{1}{8}+ sec^248 -$

tan^248}{1 + tan(90 - 72) tan72} \)

\(\frac{\frac{4}{3}+\frac{1}{8}+ 1}{2} \)= **59/48**

Question 44 :

If the sum of two positive numbers is 65 and the square root of their product is 26, then the sum of their reciprocals is:

Difficulty : Moderate   **Average Time : 54 Seconds**

Options :

1. $\frac{5}{52}$

2. $\frac{7}{52}$

3. $\frac{1}{52}$

4. $\frac{3}{52}$

Solution :

The correct answer is **option 1** i.e. $\frac{5}{52}$ FormatFormat

Let the two numbers be 'a' and 'b'

a + b = 65........(1)

$\sqrt{ab} = 26$

ab = 676..........(2)

on dividing the first equation by second equation we get,

1/a + 1/b = 65/676 = **5/52**

Question 45 :

The total surface area of a cylinder is 4092cm2 and the diameter of its base is 21 cm. What is 50% volume (in cm3) of the cylinder (nearest to an integer)?

Difficulty : Moderate   **Average Time : 57 Seconds**

Options :

1. 8922

2. 8822

3. 8932

8832

Solution :

The correct answer is **option 1** i.e. **8922**

$2\pi r(h+r)$ = 4092

Diameter = 21

Radius = 21/2

2 × 22/7 × 21/2 (h + 21/2) = 4092

h + 21/2 = 62

h = 51.5

50% of volume of cylinder = 1/2 × $\pi r^2 h$ = 1/2 × 22/7 × 10.5 × 10.5 × 51.5 = 8922.375

= **8922.**

Question 46 :

Eight year ago, the ratio of ages of A and B was 5 ; 4. The ratio of their present ages is 6 : 5. What will be the sum (in years) of the ages of A and B after 7 years from now?

Difficulty : Moderate

Average Time : 51 Seconds

Options :

1. 112

2. 90

3. 102

4. 80

Solution :

The correct answer is **option 3** i.e. **102**

Let the present age of A and B be 6x and 5x.

Age of A and B before 8 years,

A = 6x - 8 and B = 5x - 8

(6x - 8)/(5x - 8) = 5 : 4

on solving further we get,

x = 8

Age of A = 6x = 6 × 8 = 48 years

Age of B = 5x = 5 × 8 = 40 years

Sum of the age of A and B after 7 years = 48 + 40 + 14 = **102 years.**

Question 47 :
In â–³PQR, S is a point on the side QR such that QPS = (rac{1}{2})PSR, QPR = 78⁰ and PRS = 44⁰. What is the measure of PSQ?

Difficulty : Moderate   **Average Time : 57 Seconds**

Options :

1. 58⁰

2. 56⁰

3. 68⁰

4. 64⁰

Solution :
The correct answer is **option 4** i.e. **64⁰**
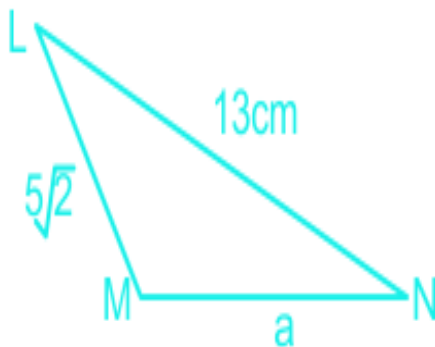
QPR = 78⁰

SPR = 78⁰ - $\frac{\theta}{2}$

By using the triangle sum property in â–³PSR,

SPR + PSR + PRS = 180°

78⁰ - $\frac{\theta}{2}$ + θ + 44 = 180

θ = 116

PSR + PSQ = 180 (linear pair)

PSQ = 180 - 116 = **64°.**

Question 48 :

If sinA = (rac{5}{13})and 7cot B = 24, then the value of (secAcosB)(cosecB tanA) is:

Difficulty : Moderate   **Average Time : 59 Seconds**

Options :

1. $\frac{13}{14}$

2. $\frac{15}{13}$

3. $\frac{65}{42}$

4. $\frac{13}{7}$

Solution :

The correct answer is **option 3** i.e. $\frac{65}{42}$

In case of sinA = $\frac{5}{13}$ = p/h

Base^2 = 169 - 25 = 144

b = 12

In case of 7cot B = 24

cot B = 24/7 = b/p

hypotenuse^2 = 576 + 49 = 625

h = 25

SecA = 13/12 and TanA = 5/12

CosB = 24/25 and CosecB = 25/7

(secAcosB)(cosecB tanA) = 13/12 × 24/25 × 25/7 × 5/12 = **65/42**

Question 49 :

An article is sold at a certain price. If it is sold at $33\frac{1}{3}$% of this price, there is a loss of $33\frac{1}{3}$%. What is the percentage profit if the article is sold at 80% of its original selling price?

Difficulty : Moderate   **Average Time : 61 Seconds**

Options :
1. 50%
2. 40%
3. 60%
4. 70%

Solution :

The correct answer is **option 3** i.e. **60%**

Let the certain SP = 300x

33.33% = 1/3

1/3 of 300x = 100x

Loss of 33.33%

If CP = 3 units then SP = 2 units,

2 units = 100x

3x = (100x/2) × 3 = 150x

80% of 300x = 240x

Profit = 240x - 150x = 90x

Profit% = 90x/150x × 100 = **60%**

Question 50 :
The sum of the interior angles of a regular polygon A is 1260 degrees and each interior angle of a regular polygon B is $128\frac{4}{7}$degrees. The sum of the numbers of sides of polygons A and B is:

Difficulty : Moderate   **Average Time : 52 Seconds**

Options :
1. 19

16

3. 18

4. 17

Solution :

The correct answer is **option 2** i.e. **16**

For polygon A,

$(n - 2) \times 180 = 1260$

$n - 2 = 7$

$n = 9$

For polygon B,

$[(n - 2) \times 180]/n = 900/7$

$7n - 14 = 5n$

$2n = 14$

$n = 7$

Sum of their sides = 9 + 7 = 16.

Question 51 :

The base of a right prism is a triangle with sides 16 cm, 30 cm and 34 cm. Its height is 32 cm. The lateral surface area (in cm^2) and the volume (in cm^3) are respectively:

Difficulty : Moderate   **Average Time : 49 Seconds**

Options :

1. 2624 and 7040

2. 2560 and 7680

3. 2688 and 7680

4. 2560 and 6400

Solution :

The correct answer is **option 2** i.e. **2560 and 7680**

(16, 30, 34) are pythagorean triplet.

The volume of prism = Area of base × height

Area of base = 1/2 × 30 × 16 = 240

The volume of the prism = 240 × 32 = 7680 cm^3.

Lateral surface area = perimeter of base × height

Lateral surface area = 80 × 32 = 2560 cm^2.

Question 52 :
In â–³ABC, M is the midpoint of the sides AB. N is a point of â–³ABC such that CN is the bisector of C and CN êž± NB. What is the length (in cm) of MN, if BC = 10 cm and AC = 15 cm?

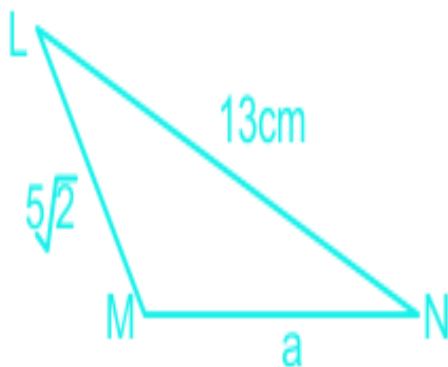**Difficulty : Moderate**

Average Time : 54 Seconds

Options :
1. 2.5

2. 2

3. 5

4. 4

Solution :
The correct answer is **option 1** i.e. **2.5**

In the given figure,

BNC = ONC = 90°

OCN = BCN

CN = NC (common)

△BNC is congruent to △ONC.

So, OC = OB = 10 cm and BN = ON

AC = 15

OA = 15 - 10 = 5 cm.

Now in △ABO,

M and N are the midpoints of AB and OB.

MN = OA/2 = 5/2 = 2.5

Question 53 :
A circle is inscribed in △PQR, touching the sides QR, PR and PQ at the points A, U and T, respectively PQ = (QR + 5)cm, PQ = (PR + 2)cm. If the perimeter of △PQR is 32 cm, then PR is equal to:
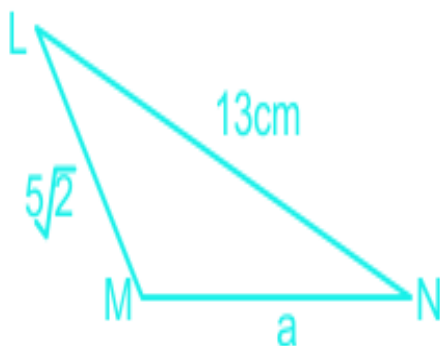
Difficulty : Moderate　　　　　　　　　　　　　Average Time : 63 Seconds

Options :

1. 8 cm

2. 11 cm

3. 13 cm

4. 10 cm

Solution :
The correct answer is **option 2** i.e. **11 cm**

According to the question,

Let PR = x then PQ = x + 2

QR = x + 2 - 5 = x - 3.

Perimeter of a â–³PQR = x - 3 + x + 2 + x = 32

3x - 1 = 32

x = 11

PR = x = 11

Question 54 :

If the sum of 40% of a number and 30% of the same number is 70, then the number is:

Difficulty : Moderate

Average Time : 49 Seconds

Options :

1. 150
2. 125
3. 200
4. 100

Solution :

The correct answer is **option 4** i.e. **100**

Let the number be 100x

40% of the number = 40x

30% of the number = 30x

40x + 30x = 70

x = 1

Original number = 100

Question 55 :

The value of $\frac{1}{4-\sqrt{15}} - \frac{1}{\sqrt{15}-\sqrt{14}} + \frac{1}{\sqrt{14}-\sqrt{13}} - \frac{1}{\sqrt{13}-\sqrt{12}} + \frac{1}{\sqrt{12}-\sqrt{11}} - \frac{1}{\sqrt{11}-\sqrt{10}} + \frac{1}{\sqrt{10}-3} - \frac{1}{3-\sqrt{8}}$ is:

Difficulty : Moderate

Average Time : 43 Seconds

Options :

1. 2 - 2√2
2. 4 + 2√2
3. 4 - 2√2
4. 2 + 2√2

Solution :

The correct answer is **option 3** i.e. **4 - 2√2**

$\frac{1}{4-\sqrt{15}} - \frac{1}{\sqrt{15}-\sqrt{14}} + \frac{1}{\sqrt{14}-\sqrt{13}} - \frac{1}{\sqrt{13}-\sqrt{12}} + \frac{1}{\sqrt{12}-\sqrt{11}} - \frac{1}{\sqrt{11}-\sqrt{10}} + \frac{1}{\sqrt{10}-3} - \frac{1}{3-\sqrt{8}}$

The rationalization form of $\frac{1}{4-\sqrt{15}} = 4 + \sqrt{15}$

The rationalization form of $\frac{1}{\sqrt{15}-\sqrt{14}} = \sqrt{15} + \sqrt{14}$

Similarly, The rationalization form of $\frac{1}{\sqrt{14}-\sqrt{13}} = \sqrt{14} + \sqrt{13}$

So one can say that,

The rationalization form of $\frac{1}{3-\sqrt{8}} = 3 + \sqrt{8}$

On combining all the forms with respect of their sign we get,

= 4 + $\sqrt{15}$ - $\sqrt{15}$ - $\sqrt{14}$ + $\sqrt{14}$ + $\sqrt{13}$ - $\sqrt{13}$ - $\sqrt{12}$ + $\sqrt{12}$ + $\sqrt{11}$ - $\sqrt{11}$ - $\sqrt{10}$ + $\sqrt{10}$ + 3 - 3 - $\sqrt{8}$

= 4 - $\sqrt{8}$

= 4 - 2√2.

Question 56 :

(rac{(1+sec heta cosec heta)^2(sec heta-tan heta)^2(1+sin heta)}{(sin heta+sec heta)^2+(cos heta+sosec heta)^2}), 0⁰ 90⁰, is equal to:

Difficulty : Moderate

Average Time : 116 Seconds

Options :

1. sin
2. 1-cos

1-sin

4. cos

Solution :

The correct answer is **option 3** i.e. **1-sin**

Question 57 :

A solid metallic cuboid of dimensions 12 cm × 54 cm × 72 cm is melted and converted into 8 cubes of the same size. What is the sum of the lateral surface areas (in cm2) of 2 such cubes?

Difficulty : Moderate   **Average Time : 39 Seconds**

Options :

1. 2592

2. 2268

3. 1944

4. 3888

Solution :

The correct answer is **option 1** i.e. **2592**

One knows that when something is melted and then recast then the volume remains the same.

The volume of a metallic cuboid = 8 × the volume of 1 cube.

$12 \times 54 \times 72 = 8 \times (\text{side})^3$

Side of new small cubes = 18 cm

Lateral surface area of 2 such cubes = 2 × 4 × 18 × 18 = 2592.

Question 58 :

Study the graph given and answer the question that follows. The average production of fertilizers by country Z in 2017,2018 and 2020 is what percentage more than the average production of fertilizers by country X in 2018 and 2020?

Difficulty : Moderate   **Average Time : 51 Seconds**

Options :

1. 45%

2. 32.4%

48%

4. 49.6%

Solution :

The correct answer is **option 3** i.e. **48%**

The average production of fertilizers by country Z in 2017,2018 and 2020 = (330 + 360 + 420) = 1110/3 = 370

The average production of fertilizers by country X in 2018 and 2020 = (240 + 260)/2 = 250

Required % = (370 - 250)/250 × 100 = **48%**

Question 59 :
What is the difference (in rs) between the interest on Rs 50,000 for one year at 8% per annum compounded half-yearly and yearly?

Difficulty : Moderate   **Average Time : 41 Seconds**

Options :
1. 100
2. 80
3. 70
4. 50

Solution :

The correct answer is **option 2** i.e. **80**

Amount after 1 year compounded yearly

50000 × 108/100 = 54000

Interest earned = 4000

Amount after 1 year compounded half yearly,

50000 × 104/100 × 104/100 = 54080.

Interest earned = 4080

Required difference = 4080 - 4000 = 80

Question 60 :

The radius of the base of a cylindrical tank is 4m. If three times the sum of the areas of its circular faces is twice the area of its curved surface, then the capacity (in kiloliters) of the tank is:

Difficulty : Moderate   **Average Time : 47 Seconds**

Options :

1. 54
2. 96
3. 144
4. 108

Solution :

The correct answer is **option 2** i.e. **96**

The radius of the base of a cylindrical tank is 4m.

It is given that three times the sum of the areas of its circular faces is twice the area of its curved surface.

$3 \times 2r^2 = 2 \times 2rh$

$6r = 4h$

$h = 6m.$

Volume of cylinder = r^2h.

$\times 4 \times 4 \times 6 = 96.$

Question 61 :

4 men and 5 women can complete a work in 15 days, whereas 9 men and 6 women can complete it in 10 days. To complete the same work in 7 days, how many women should assist 4 men?

Difficulty : Moderate   **Average Time : 57 Seconds**

Options :

1. 14
2. 11
3. 15
4. 13

Solution :

The correct answer is **option 4** i.e. **13**

Let the efficiency of 1 man and 1 woman be 'm' units and 'w' units.

According to the question,

(4m + 5w) × 15 = (9m + 6w) × 10

w = 2m.

The efficiency of a woman is twice of a man.

Total work in terms of women = (2w + 5w) × 15 = 105w

Now.

(x × w + 4m) × 7 = 105w

7wx + 14w) = 105w

7wx = 91w

x = 13 days.

Question 62 :
The radius of a solid right circular cone is 36 cm and its height is 105 cm. The total surface area (in cm2) of the cone is:

Difficulty : Moderate

Average Time : 56 Seconds

Options :
1. 3969
2. 4296
3. 5292
4. 3996

Solution :
The correct answer is **option 3** i.e. **5292**

Radius of a cone = 36 cm.

Height of a cone = 105 cm.

Slant height = $\sqrt{36^2 + 105^2}$

l = 111 cm.

The total surface area of cone = rl + r^2.

= r(l + r)

= × 36 × (111 + 36) = 5292

Question 63 :

The income of A is 80% of B's income and the expenditure of A is 60% of B's expenditure. If the income of A is equal to 90% of B's expenditure, then by what percentage are the savings of A more than B's savings?

Difficulty : Moderate   **Average Time : 57 Seconds**

Options :

1. 140%

2. 125%

3. 100%

4. 150%

Solution :

The correct answer is **option 1** i.e. **140%**

The income of A is 80% of B's income

Income(B : A) = 100/80 = 5 : 4.

Let A's and B's income will be 4x and 5x

The expenditure of A is 60% of B's expenditure.

Expenditure(B : A) = 100/60 = 5 : 3.

Let the Expenditure of A and B be 3y and 5y

According to the question,

The income of A is equal to 90% of B's expenditure

4x = 90/100 × 5y

x/y = 9/8

Put x = 9 units and y = 8 units then,

	Income	Expenditure	Savings
A	36 units	24 units	12 units
B	45 units	40 units	5 units

Required % = (12 - 5)/5 × 100 = 140%

Question 64 :

S and T are points on the sides PQ and PR, respectively of â–³PQR such that PS × PR = PQ × PT. If Q = 96⁰ and PST = PRQ + 34⁰, then QPR = ?
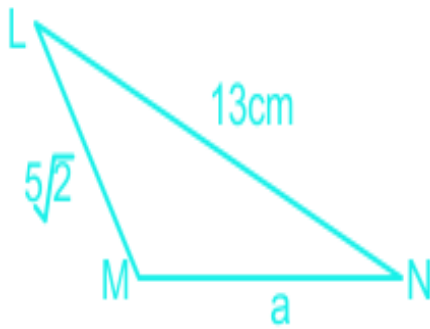
Difficulty : Moderate

Average Time : 78 Seconds

Options :

1. 25⁰

2. 26⁰

3. 22⁰

4. 24⁰

Solution :

The correct answer is **option 3** i.e. **22⁰**

PS × PR = PQ × PT

PS/PQ = PT/PR

So one can say that,

â–³PQR is similar to the â–³PST.

So ST || QR , PST = 96°

It is given that,

PST = PRQ + 34º

PRQ = 96 - 34 = 62°

By using triangle angle sum property,

QPR = 180 - PQR - PRQ

QPR = 180 - 96 - 62 = 22°

Question 65 :

If 3 tan = 23 sin, 0º 90º, then the value of (rac{cosec^2 2 heta + cot^2 2 heta}{sin^2 heta+tan^2 2 heta}) is:

Difficulty : Moderate

Average Time : 64 Seconds

Options :

1. $\frac{20}{39}$

2. $\frac{20}{27}$

3. $\frac{4}{13}$

4. $\frac{4}{3}$

Solution :

The correct answer is **option 1** i.e. $\frac{20}{39}$

3 tan = 23 sin

cos = 3/2 = cos30

 = 30°.

= $\frac{cosec^2 2 \theta + cot^2 2\theta}{sin^2\theta+tan^2 2\theta}$

= [cosec^2(60) + cot^2(60)]/[sin^2 30 + tan^{2}60]

= [4/3 + 1/3]/[1/4 + 3]

= (5/3)/(13/4)

= 20/39.

Question 66 :

A trader gains 25% by selling an article with 20% discount on its marked price. If the cost price of the article increases by 30%, then how much discount (in %) should he offer on the same marked price to gain 15% of the profit?

Difficulty : Difficult

Average Time : 59 Seconds

Options :

1. 5.08%

2. 4.87%

3. 4.32%

4. 5.12%

Solution :

The correct answer is **option 3** i.e. **4.32%**

Let the CP of an article = 100x

SP of an article to get a gain of 25% = 125x

Discount % = 20%

MP = 125x × 100/80 = 156.25x

Now the CP is increased by 30%

New CP = 100x × 130% = 130x

To get a gain of 15%

New SP of an article = 130x × 115% = 149.5x

Discount offered = 156.25x - 149.5 = 6.75x

Discount% = 6.75x/156.25 × 100 = **4.32%**

Question 67 :

If an article is sold for Rs 355, there is a loss of 29%. At what price (in Rs) should it be sold to gain 31% of profit?

Difficulty : Moderate

Average Time : 53 Seconds

Options :

1. 625

2. 675

3. 655

4. 635

Solution :

The correct answer is **option 3** i.e. **655**

Let the CP of an article be 100x.

There is a loss of 29% when it sold at 355

Selling price in terms of x = 100x - 29x = 71x

71x = 355

x = 5

100x = 5 × 100 = 500.

To get a gain of 31%, SP of an article in terms of x = 100x + 31x = 131x

131x = 131 × 5 = **655**

Question 68 :

The value of (rac{3(cot^2 47^0 - sec^2 43^0) 43^0 - 2(tan^2 23^0 -cosec^2 67^0)}{cosec^2 (68^0 + heta)-tan(heta+61^0)-tan^2(22^0- heta)+cot(29^0- heta)}) is:

Difficulty : Moderate   **Average Time : 50 Seconds**

Options :

1. -1

2. 0

3. 5

4. 1

Solution :

The correct answer is **option 1** i.e. **-1**

$[3(\tan^2 43 - \sec^2 43) - 2(\cot^2 67 - \cosec^2 67)]/[\cosec^2(68 + \theta) - \tan(\theta + 61) - \cot^2(68 + \theta) + \tan(\theta + 61)$

$= (-3 + 2)/(1 - 0)$

$= -1/1 = 1.$

Question 69 :

What is the area (in unit squares) of the region enclosed by the graphs of the equations 2x - 3y + 6 = 0, 4x + y = 16 and y = 0?

Difficulty : Moderate

Average Time : 49 Seconds
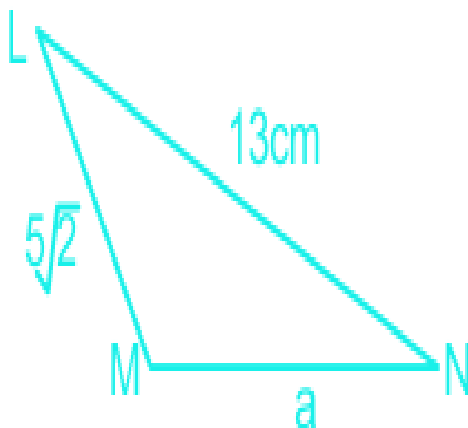
Options :

1. 14
2. 11.5
3. 10.5
4. 12

Solution :

The correct answer is **option 1** i.e. **14**

For 2x - 3y = -6

x	0	-3
y	2	0

For 4x + y = 16

x	3	4
y	4	0

From the above figure the vertices of the triangle will be (3,4), (-3,0) and (4,0)

$$\begin{aligned} &\text { Area of triangle }=\frac{1}{2}\left|x_{1}\left(y_{2}-y_{3}\right)+x_{2}\left(y_{3}-\right.\right.\end{aligned}$$

$y_{1}\right)+x_{3}\left(y_{1}-y_{2}\right)\right| \\ &\Rightarrow \frac{1}{2}|3(0-0)+4(0-4)+(-3)(4-0)| \\ &\Rightarrow \frac{1}{2}|0+(-16)+(-12)| \\ &\Rightarrow \frac{1}{2}|-16-12| \\ &\Rightarrow \frac{1}{2}|-28| \end{aligned}$

= 14.

Question 70 :

A tap can fill a tank in 5½hours. Because of a leak, it took 8(rac{1}{4})hours to fill the tank. In how much time (in hours) will the leak alone empty 30% of the tank?

Difficulty : Moderate

Average Time : 80 Seconds

Options :

1. $\frac{17}{2}$

2. $\frac{5}{2}$

3. $\frac{9}{2}$

4. $\frac{99}{20}$

Solution :

The correct answer is **option 4** i.e. $\frac{99}{20}$

A tap can fill a tank in 5½hours = 11/2 hours

Let the efficiency of A = 2 units per hour

Then the total work = 11/2 × 2 = 11 units.

Due to a leak, it takes = 33/4 hours.

Let the efficiency of a leak be x unit per hour

(2 - x) × 33/4 = 11

x = 2/3

30% of work = 11 × 30% = 3.3 units

Times taken by a leak to empty the tank = 3.3/(2/3) = 99/20.

Question 71 :

A saves 35% of his income. If his income increases by 20.1% and his expenditure increases by 20%, then by what percentage do his savings increase or decrease? (correct to one decimal place)

Difficulty : Moderate

Average Time : 62 Seconds

Options :

1. 20.3% of increase

2. 19.75% of decrease

3. 18.5% of decrease

4. 21.9% of increase

Solution :

The correct answer is **option 1** i.e. **20.3% of increase**

Let the income of A = 100x

Savings of A = 100x × 35% = 35x

Expenditure = 65x

Increased income = 100x × 120.1% = 120.1x

Increased expenditure = 65x × 120% = 78x

New savings = 120.1x - 78x = 42.1x

% increase = (42.1x - 35x)/35x × 100 = **20.3%**

Question 72 :

The value of $(2\frac{6}{7}$ of $4\frac{1}{5} \div \frac{2}{3}) \times 5\frac{1}{9} \div (\frac{3}{4} \times 2\frac{2}{3}$ of $\frac{1}{2} \div \frac{1}{4})$ is:

Difficulty : Moderate

Average Time : 49 Seconds

Options :

1. 19

2. 23

3. 25

4. 21

Solution :

The correct answer is **option 2** i.e. **23**

$(2\frac{6}{7}$ of $4\frac{1}{5} \div \frac{2}{3}) \times 5\frac{1}{9} \div (\frac{3}{4} \times 2\frac{2}{3}$ of $\frac{1}{2} \div$

$\frac{1}{4}$)

(20/7 of 21/5 ÷ $\frac{2}{3}$)) × 46/9 ÷ (($\frac{3}{4}$)× 8/3 of $\frac{1}{2}$)÷$\frac{1}{4}$))

(20/7 of 21/5 ÷ $\frac{2}{3}$)) × 46/9 ÷ (($\frac{3}{4}$)× 8/3 of $\frac{1}{2}$)÷$\frac{1}{4}$))

(12 × 3/2) × (46/9) ÷ (3/4 × 4/3 × 4)

(18) × (46/9) ÷ (4)

18 × 46/9 × 1/4 = **23**

Question 73 :

The income of A is (rac{2}{3}) of B's income and the expenditure of A is (rac{3}{4})of B's expenditure. If (rac{1}{3})of the income of B is equal to the expenditure of A, then the ratio of the savings of A to those of B is:

Difficulty : Moderate   **Average Time : 79 Seconds**

Options :

1. 5 : 3

2. 4 : 3

3. 3 ; 5

4. 3 : 4

Solution :

The correct answer is **option 3** i.e. **3 : 5**

According to the question,

	Income	Expenditure	Savings
A	2x	3y	
B	3x	4y	

1/3 of 3x = 3y

x = 3y

So the above table will looks like that,

	Income	Expenditure	Savings
A	6y	3y	3y

B	9y	4y	5y

Ratio of their savings = 3y : 5y = 3 : 5

Question 74 :
If a, b and c are positive numbers such that (a2 + b2) : (b2 + c2) : (c2 + a2) = 34 : 61 : 45, then b - a : c - b : c - a = _____.

Difficulty : Moderate   **Average Time : 71 Seconds**

Options :

1. 1 : 2 : 3

2. 3 : 1 : 2

3. 2 : 1 : 3

4. 3 : 2 : 1

Solution :
The correct answer is **option 3** i.e. **2 : 1 : 3**

$(a^2 + b^2) : (b^2 + c^2) : (c^2 + a^2) = 34 : 61 : 45$

$(a^2 + b^2) = 34$ units

$(b^2 + c^2) = 61$ units

$(c^2 + a^2) = 45$ units

On adding each we get,

$2(a^2 + b^2 + c^2) = 140$

$a^2 + b^2 + c^2 = 70$

$a^2 = 70 - 61 = 9$

$a = 3$

$b^2 = 70 - 45 = 25$

$b = 5$

$c^2 = 70 - 34 = 36$

c = 6

b - a : c - b : c - a = 6 - 3 : 6 - 5 : 6 - 3

= 2 : 1 : 3

Question 75 :

Let x = (433)24 - (377)38 + (166)54. What is the units digit of x?

Difficulty : Moderate   **Average Time : 68 Seconds**

Options :

1. 7

2. 6

3. 8

4. 9

Solution :

The correct answer is **option 3** i.e. **8**

Unit digit of $(433)^{24}$ = unit digit of 3^{24}

Cyclicity of 3,

3^1 ends with 3

3^2 ends with 9

3^3 ends with 7

3^4 ends with 1

3^{24} = 24/4 = 6 completely divisible, it ends with with 1

unit digit of $(377)^{38}$ = unit digit of 7^{38}

7^1 ends with 7

7^2 ends with 9

7^3 ends with 3

7^4 ends with 1

7^{38} = 38/4 = 2 rem.

Ends with 9.

$(166)^{54} = 6^{54}$

Any power of 6 ends with 6.

Unit digit of $6^{54} = 6$

x = 1 - 9 + 6 = 7 - 9

x = 17 - 9 = 8.

Question 76 :

Study the given pie charts and answer the question that follows. The number of students who passed the examination from institute C is what percentage of the total number of students who appeared from institutes D and E ?

Difficulty : Moderate   **Average Time : 72 Seconds**

Options :

1. 52.1%

2. 56.25%

3. 54.25%

4. 58.3%

Solution :

The correct answer is **option 2** i.e. **56.25%**

The number of students who appeared from C = 90/360 × 1200 = 300.

The number of students who appeared from D = 105/360 × 1200 = 350.

The number of students who appeared from E = 39/360 × 1200 = 130.

Number of students who passed from institute C = 900 × 30% = 270

% required = 270/480 × 100 = **56.25%.**

Question 77 :

The surface area of a sphere is 221.76 cm2. Its volume (in cm3) is (correct to one decimal place). (Take = (rac{22}{7}))

Difficulty : Moderate   **Average Time : 46 Seconds**

Options :

289.8

2. 315.6

3. 280.4

4. 310.5

Solution :

The correct answer is **option 4** i.e. **310.5**

The surface area of a sphere = $4\pi r^2$

$4\pi r^2$ = 221.76

r = 4.2

Volume of sphere = $\frac{4}{3}\pi r^3$

= 4/3 × 22/7 × 4.2 × 4.2 × 4.2 = 310.464

= **310.5.**

Question 78 :
The value of (rac{1}{4}) + is:

Difficulty : Moderate   **Average Time : 43 Seconds**

Options :

1. $\frac{9}{20}$

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

3. $\frac{7}{20}$

4. $\frac{3}{20}$

Solution :

The correct answer is **option 1** i.e. $\frac{9}{20}$

$\frac{1}{4}$ + $\dfrac{\{(20.35)^2 - (8.35)^2\}] \times 0.0175}{(1.05)^2 + (1.05)(27.65)}$

1/4 + [(20.35 + 8.35)(20.35 - 8.35) × 0.0175]/[1.1025 + 29.0325]

1/4 + [6.027]/[30.135]

1/4 + 1/5 = 9/20.

Question 79 :

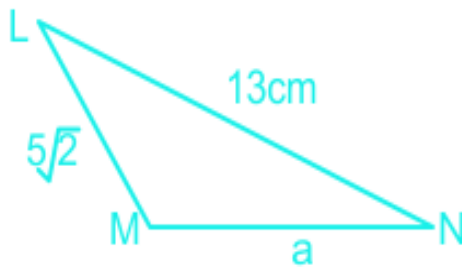The angle of elevation of the top of a tower 253 m high from two points on the level ground on its opposite sides are 45º and 60º. What is the distance between the two points?

Difficulty : Moderate

Average Time : 53 Seconds

Options :

1. 58.4

2. 68.3

3. 50.6

4. 45.3

Solution :

The correct answer is **option 2** i.e. **68.3**

In $\triangle$ABC ,

Tanθ = AC/BC

Tan45 = 253/BC

BC = 253.

In $\triangle$ACD ,

Tan60° = AC/CD

3 = 253/CD

CD = 25.

BD + CD = 25 + 253 = 68.3.

Question 80 :

O is a point in the interior of △ABC such that OA = 12 cm, OC = 9 cm, AOB = BOC = COA and ABC = 60º. What is the length (in cm) of OB?
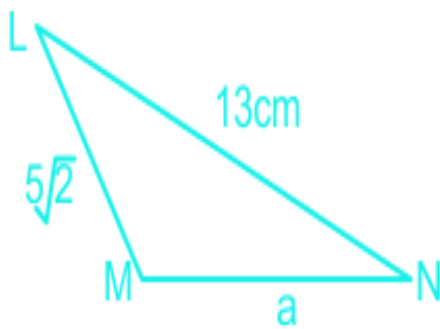
Difficulty : Moderate

Average Time : 59 Seconds

Options :

1. 62
2. 46
3. 63
4. 43

Solution :

The correct answer is **option 3** i.e. **63**

AOB = BOC = COA = a (let).

3a = 360

a = 120

AOB = BOC = COA = 120°

If one let ABO = θ then , OBC = (60 - θ)

Then OCB = θ and BAO = (60 - θ).

So one can say that △AOB is similar to the △BOC,

OB/OA = OC/OB

OB^2 = OA × OC

OB = 63.

Question 81 :

In △ABC, B = 78⁰, AD is a bisector of A meeting BC at D, and AE ⊥ BC at E. IF DAE = 24⁰, then the measure of ACB is:
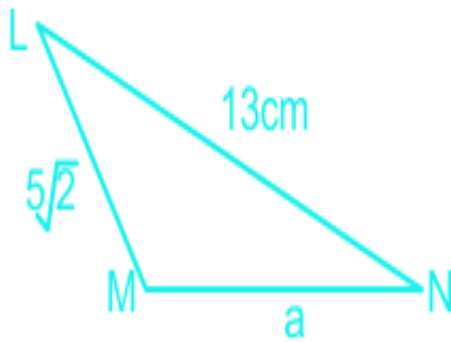
Difficulty : Moderate

Average Time : 74 Seconds

Options :
1. 38⁰
2. 42⁰
3. 30⁰
4. 32⁰

Solution :
The correct answer is **option 3** i.e. **30⁰**

DAE = 24⁰, B = 78⁰

In △ABE,

 B + E + BAE = 180°

BAE = 180 - 78 - 90 = 12°.

BAD = 12 +24 = 36

AD is the angle bisector of A so BAD = DAC = 36°

In △ABC,

B + A + C = 180

C = 180 - 78 - 72

C = 30°.

Question 82 :

$\left(\left(\frac{\tan^3 \theta}{\sec^2 \theta}+\frac{\cot^3 \theta}{\csc^2 \theta}+2\sin \theta \cos \theta\right)\right) \div (1 + \csc 2 + \tan 2)$, 0° 90°, is equal to:

Difficulty : Moderate

Average Time : 63 Seconds

Options :

1. sec
2. cosecsec
3. sin cos
4. cosec

Solution :

The correct answer is **option 3** i.e. **sin cos**

$= \left(\frac{\tan^3 \theta}{\sec^2 \theta}+\frac{\cot^3 \theta}{\csc^2 \theta}+2\sin \theta \cos \theta\right) \div (1 + \csc^2 + \tan^2)$

$= \frac{\frac{\sin^3 \theta}{\cos^3 \theta}}{\frac{1}{\cos^2 \theta}} + \frac{\frac{\cos^3 \theta}{\sin^3 \theta}}{\frac{1}{\sin^2 \theta}}$ + 2sincos $\div (\csc^2 + \sec^2)$

$= \frac{ (\sin^2 \theta)^2 + (\cos^2 \theta)^2 + 2\sin^2 \theta \cos^2 \theta}{\sin \theta \cos \theta} \div (\sin^2 + \cos^2)/(\sin^2 \cos^2)$

= sin cos.

Question 83 :

Let 0° 90°. (1 + cot2) (1+tan2) × (sin - cosec) (cos - sec) is equal to:

Difficulty : Moderate

Average Time : 75 Seconds

Options :

1. sec + cosec
2. sin cos
3. sin + cos
4. sec cosec

Solution :

The correct answer is **option 4** i.e. **sec cosec**

$(1 + \cot^2)(1+\tan^2) \times (\sin - \csc)(\cos - \sec)$

we know that, $(1 + \cot^2) = \csc^2$ and $(1+\tan^2) = \sec^2$.

$\csc^2 \times \sec^2 \times (\sin - 1/\sin)(\cos - 1/\cos)$

$(1/\sin^2) \times (1/\cos^2) \times [(\sin^2 - 1)/\sin] \times [(\cos^2 - 1)/\cos]$

= **Cosec Sec**

Question 84 :

Three fractions x, y and z are such that x > y > z. When the smallest of them is divided by the greatest, the result is (rac{9}{16}), which exceeds y by 0.0625. If x + y + z = 2(rac{3}{12}), then what is the value of x + z?

Difficulty : Moderate   **Average Time : 72 Seconds**

Options :

1. $\frac{7}{4}$

2. $\frac{3}{4}$

3. $\frac{1}{4}$

4. $\frac{5}{4}$

Solution :

The correct answer is **option 1** i.e. $\frac{7}{4}$

Here, $(1/x)/(1/z) = 9/16$

$z/x = 9/16$

$y = 9/16 - 0.0625$

$y = 9/16 - 1/16 = 1/2$

$x + y + z = 2\frac{3}{12}$

$x + z = 27/12 - 1/2 = 21/12$

$x + z = 7/4$.

Question 85 :

If a + b = 8, ab = 10, then the value of a3 + b3 is:

Difficulty : Moderate

Average Time : 46 Seconds

Options :

1. 111
2. 215
3. 272
4. 312

Solution :

The correct answer is **option 3** i.e. **272**

$a + b = 8$,

We know that, $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$

on cubing both side we get,

$(a + b)^3 = 8^3$

$a^3 + b^3 + 3ab(a + b) = 512$

$a^3 + b^3 = 512 - 240$

$a^3 + b^3 = 272$

Question 86 :

One cup has juice and water in the ratio 5 : 2, while another cup of the same capacity has them in the ratio 7 : 4, respectively. If contents of both the cups (when full) are poured in a vessel, then what will be the final ratio of water to juice in the vessel?

Difficulty : Moderate

Average Time : 59 Seconds

Options :

1. 25 : 26
2. 25 : 52
3. 26 : 25
4. 52 : 25

Solution :

The correct answer is **option 2** i.e. **25 : 52**

	Juice	water	total
CUP_1	5	2	7 units
CUP_2	7	4	11 units

the capacity of both the cup is the same.

To make it equal multiply the content of the first cup by 11 and the second cup by 7.

	Juice	water	total
CUP_1	55	22	77 units
CUP_2	49	28	77 units

Content of juice and water in Cup_3 will be in the ratio of (55 + 49) : (22 + 28) = 104 : 50 = 52 : 25

Ratio of water to juice = 25 : 52.

Question 87 :
The volume of a solid cylinder is 2002 cm3 and its height is 13 cm. What is the area (in cm2) of its base? (Take = $(rac{22}{7})$)

Difficulty : Moderate   **Average Time : 77 Seconds**

Options :
   1. 154

   2. 308

   3. 77

   4. 231

Solution :
The correct answer is **option 1** i.e. **154**

Volume is r^2h and Area of base of a cylinder = r^2 = 2002

$r^2h = 2002$

$r^2 \times 13 = 2002$.

$r^2 = 154$

Question 88 :

The sum of and the difference between the LCM and HCF of two numbers are 512 and 496, respectively. If one number is 72, then the other number is:

Difficulty : Moderate   **Average Time : 46 Seconds**

Options :

1. 56
2. 40
3. 80
4. 64

Solution :

The correct answer is **option 1** i.e. **56**

Sum of LCM and HCF = 512 LCM + HCF = 512......(1)

Difference of LCM and HCF = 496 LCM - HCF = 496.........(2)

On solving 1 and 2 we get,

LCM = 504 and HCF = 8

HCF × LCM = No1 × No2

8 × 504 = 72 × No2

No2 = 56.

Question 89 :

The value of $(1\frac{1}{3} \div 2\frac{6}{7} \text{ of } 5\frac{3}{5})) \times (6\frac{2}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3})) \div ((\frac{3}{4} \times 2\frac{2}{3}) \div (\frac{5}{9}) \text{ of } 1\frac{1}{5})) = k$, where k lies between:

Difficulty : Moderate   **Average Time : 49 Seconds**

Options :

   0.007 and 0.008

2. 0.7 and 0.8

3. 0.0007 and 0.0008

4. 0.07 and 0.08

Solution :

The correct answer is **option 1** i.e. **0.007 and 0.008**

$(1\frac{1}{3} \div 2\frac{6}{7} \text{ of } 5\frac{3}{5}) \times (6\frac{2}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3}) \div (\frac{3}{4} \times 2\frac{2}{3} \div \frac{5}{9} \text{ of } 1\frac{1}{5}) = k$

$(4/3 \div 20/7 \text{ of } 28/5) \times (32/5 \div 9/2 \text{ of } 16/3) \div (3/4 \times 8/3 \div 5/9 \text{ of } 6/5) = k$

$(1/12) \times (4/15) \div (3) = $ **0.0074**

Question 90 :

In â–³LMN, LM = 52 cm, LN = 13 cm and LMN = 135º. What is the length (in cm) of MN?

Difficulty : Moderate   **Average Time : 58 Seconds**
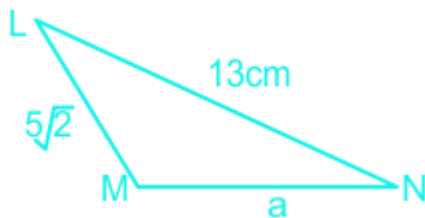
Options :

1. 72

2. 8

3. 7

4. 82

Solution :

The correct answer is **option 3** i.e. **7**

Let the length of MN be 'a'.

By using the cosine rule with respect to 135°

Cos135° = $\frac{a^2 + (5\sqrt2)^2 - (13)^2}{2 \times 5\sqrt2 \times a}$

$\frac{-1}{\sqrt2}$ = $\frac{a^2 + 50 - 169}{2 \times 5\sqrt2 \times a}$

a^2 + 10a - 119 = 0

a^2 + 17a - 7a - 119 = 0

(a + 17)(a - 7)= 0

a = 7

Question 91 :
A and B can do a work in 26(rac{2}{3})days. B and C together can complete the same work in 48 days, while A and C together can complete the same work in 30 days. How long (in days) will A alone take to complete 60% of the work?

Difficulty : Moderate   **Average Time : 68 Seconds**

Options :
1. 20
2. 24
3. 32
4. 36

Solution :
The correct answer is **option 2** i.e. **24**

A + B = 80/3 days.

B + C = 48 days.

A + C = 30 days.

Let the total work = 240 units.

Efficiency of A + B = 9 units/day....(1)

Efficiency of B + C = 5 units/day......(2)

Efficiency of A + C = 8 units/day.....(3)

on adding eq (1, 2, 3) we get,

2(A + B + C) = 22 units.

A + B + C one day efficiency = 11 units.

Efficiency of A = 11 - 5 = 6 units/day.

60% of work = 60/100 × 240 = 144 units.

Time taken by A to complete 144 units of work = 144/6 = 24 days.

Question 92 :

If a + b + c = 1, ab + bc + ca = -22 and abc = -40, then what is the value of a3 + b3 + c3 ?

Difficulty : Moderate

Average Time : 57 Seconds

Options :

1. -53

2. 27

3. 67

4. -51

Solution :

The correct answer is **option 1** i.e. **-53.**

a + b + c = 1

on squaring both sides we get,

$a^2 + b^2 + c^2 + 2(ab + bc + ca) = 1$

$a^2 + b^2 + c^2 = 1 + 44 = 45.$

$a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

$a^3 + b^3 + c^3 = 1 × (45 + 22) - 3 × 40$

$a^3 + b^3 + c^3 = 67 - 120 = -53$

Question 93 :

When the pirce of an item was reduced by 20%, its sale increased by x%. If there is an increase of 25% in receipt of the revenue, then the value of x is:

Difficulty : Moderate

Average Time : 68 Seconds

Options :

1. 54.35
2. 55.35
3. 57.75
4. 56.25

Solution :

The correct answer is **option 4** i.e. **56.25**

Let

S.no	Sale	Rate\kg	Revenue
1	100x	100y	10000xy
2.	?	80y	12500xy

In second case the sale become = 12500xy/80y = 156.25x

% increase = (156.25x - 100x)/100x × 100 = 56.25%

Question 94 :

The numbers of students in section A and section B of a class are 50 and 62, respectively. The average score in mathematics of all the students is 75. If the average score of students in section A is 20% more than that of students in section B, then what is the average score of students in section A (correct to one decimal place)?

Difficulty : Moderate

Average Time : 64 Seconds

Options :

1. 84.3
2. 82.6
3. 85.7
4. 87.5

Solution :

The correct answer is **option 2** i.e. **82.6**

The number of students in sections A and B are 50 and 62.

Let the average score of the student in section B is 5a then the average score of the student in section A is 6a.

The sum of the score of students in Sections A and B are 6a × 50 and 5a × 62

The average score of all students = 75

Sum of the score of all students in mathematics = 75 × (50 +62) = 8400.

300a + 310a = 8400

610a = 8400

a = 13.77

6a = 13.77 × 6 = 82.62 (82.6 approx).

Question 95 :
(rac{1+cosθ-sin^2θ}{sinθ(1+cosθ)})×(rac{sqrt {sec^2θ+cosec^2θ}}{tanθ+cotθ}) , 0º 90º, is equal to:

Difficulty : Moderate   **Average Time : 57 Seconds**

Options :

1. cot

2. tan

3. cosec

4. sec

Solution :

The correct answer is **option 1** i.e. **cot**

= \(\frac{1+cosθ-sin^2θ}{sinθ(1+cosθ)}\)×\(\frac{\sqrt {sec^2θ+cosec^2θ}}{tanθ+cotθ}\)

= (1 - sin^2\(\theta\) + cos\(\theta\))/(sin\(\theta\)(1 + cos\(\theta\)) × (1/sin\(\theta\)cos\(\theta\))/(1/sin\(\theta\)cos\(\theta\))

= cos\(\theta\)/sin\(\theta\) × 1

= cot\(\theta\).

Question 96 :
A person makes an article 36% above the cost price and offers 30% discount on the marked price. What is the loss or gain

percentage?

Difficulty : Moderate

Average Time : 63 Seconds

Options :

1. Loss 6.5%

2. Loss 4.8%

3. Gain 8.5%

4. Gain 7.2%

Solution :

The correct answer is **option 2** i.e. **Loss 4.8%**

Let the CP = 100x

MP = 100x × 136% = 136x.

Discount offered = 136x × 30/100 = 40.8x

SP = 136x - 40.8 = 95.2x

Loss % = (100x - 95.2x)/100 × 100 = 4.8%

Question 97 :

If the amount obtained by A by investing Rs 9,100 for three years at a rate of 10%p.a. on simple interest is equal to the amount obtained by B by investing a certain sum of money for five years at a rate of 8% p.a. on simple interest, then 90% of the sum invested by B (in Rs) is:

Difficulty : Moderate

Average Time : 51 Seconds

Options :

1. 8,540

2. 8,450

3. 7,800

4. 7,605

Solution :

The correct answer is **option 4** i.e. **7,605**

Let the amount invested by B = P

According to the question,

A invested the amount at the rate of 10% for 3 years, then the amount becomes 130% of the initial sum.

9100 × 130% = P × 140%

On solving further,

P = 8450

90% of P = 7605.

Question 98 :
The radius of a spherical balloon is inflated from 3.5 cm to 4.9 cm by pushing air into it. What is the percentage increase in the volume of the original balloon?

Difficulty : Moderate   **Average Time : 49 Seconds**

Options :

1. 174.4%

2. 73.6%

3. 74.4%

4. 173.6%

Solution :
The correct answer is **option 1** i.e. **174.4%**

the initial volume of the spherical balloon = 4/3 × π × $(3.5)^3$ = 4/3 × π × 42.875

The final volume of the spherical balloon = 4/3 × π × $(4.9)^3$ = 4/3 × π × 117.649.

% increase = (4/3 × π × 74.774)/(4/3 × π × 42.875) × 100 = 174.4%.

Question 99 :
If 7 sin2 + 4 cos2 = 5 and lies in the first quadrant, then what is the value of $\left(\frac{\sqrt{3}\sec\theta + \tan\theta}{\sqrt{2}\cot\theta - \sqrt{3}\cos\theta}\right)$?

Difficulty : Moderate   **Average Time : 71 Seconds**

Options :

1. 32

2. 2(2-1)

42

4. 2(1+2)

Solution :

The correct answer is **option 4** i.e. **2(1+2)**

$7 \sin^2 + 4 \cos^2 = 5$

$3 \sin^2 + 4 \sin^2 + 4 \cos^2 = 5$

$3 \sin^2 = 1$

$\sin = 1/\sqrt3 = P/H$

$B^2 = 3 - 1 = 2$

$B = \sqrt2$

$\sec = \sqrt{\frac{3}{2}}$, $\tan = 1/\sqrt2$, $\cot = \sqrt2$ and $\cos = \sqrt{\frac{2}{3}}$

$\frac{\sqrt{3} \sec \theta + \tan \theta}{\sqrt{2} \cot \theta - \sqrt{3} \cos \theta} = \frac{\sqrt3 \times \sqrt{\frac{3}{2}} + \frac{1}{\sqrt2}}{\sqrt2 \times \sqrt2 - \sqrt3 \times \sqrt{\frac{2}{3}}} = \frac{2 \sqrt2}{2-\sqrt2}$

On further rationalization we get,

$= \frac{2 \sqrt2(2+\sqrt2)}{4-2} = $ **2(1+2)**

Question 100 :

If x = (sqrt{1+rac{sqrt{3}}{2}}-sqrt{1-rac{sqrt{3}}{2}}) , then the value of (rac{sqrt{}3-x}{sqrt{}3+x})(corrected to two decimal places) is:

Difficulty : Moderate   **Average Time : 83 Seconds**

Options :

1. 0.25

2. 0.27

3. 0.17

4. 0.19

Solution :

The correct answer is **option 2** i.e. **0.27**

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

On squaring both sides we get,

$x^2 = 1 + \frac{\sqrt3}{2} + 1 - \frac{\sqrt3}{2} + 2 \times \sqrt{(1 + \frac{\sqrt3}{2}) \times (1 - \frac{\sqrt{3}}{2})}$

$x^2 = 2 - 1$

$x^2 = 1$

x = +1 , -1

$\frac{√3-x}{√3+x} = \frac{\sqrt3 -1}{\sqrt3 + 1}$

On rationalization,

(3 + 1 - 2$\sqrt3$)/(3 - 1)

2 - $\sqrt3$

2 - 1.73 = 0.27

Ssc Cgl Tier II Previous Year Question Paper Analysis

The analysis of Ssc Cgl Tier II Previous Year Question Paper held on 2022-01-29 in the Morning exam is as follows:
1. 99 questions were moderate and 1 questions were hard.
2. The safe score is 140 marks.
3. 100 questions were asked from Quantitative Aptitude and 100 questions were asked from Quantitative Aptitude
4. 0 questions should have been skipped if you were short of time.

Ssc Cgl Tier II Previous Year Question Paper Topic Wise Weightage

Quantitative Aptitude

1. Simplification - 7
2. Average - 2
3. Percentage - 5
4. Data Interpretation - 6
5. Time And Work - 3
6. Time Speed And Distance - 4
7. Interest - 3

Ssc Cgl Tier II Previous Year Question Paper Tips and Tricks

TIPS & TRICKS

1. Try to solve Ssc Cgl Tier II Previous Year Question Paper without taking any help from the solutions.
2. Ssc Cgl Tier II Previous Year Question Paper require proper usage of concept so firstly read the question thoroughly and then use the right concept.
3. In case you're not able to solve the question in less than 30 seconds in the exam then you should skip the question and move to the next question.

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