

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 2020-11-16 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 shopkeeper earns a profit of 21% after selling a book at 21% discount on the printed price. The ratio of the cost price and selling price of the book is :

Difficulty : Moderate

Average Time : 46 Seconds

Options :

1. 79 : 100
2. 100 : 79
3. 121 : 100
4. 100 : 121

Solution :

The correct answer is **option 4** i.e. **100 : 121**

Let the cost price of the book be 100x

After applying the discount still shopkeeper earns a profit of 21%

Selling price = $100x \times 1.21$

121x

$100x : 121x = 100 : 121$

Question 2 :

If $(x + y)^3 + 8(x - y)^3 = (3x + Ay)(3x^2 + Bxy + Cy^2)$, then the value of $A + B + C$ is:

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

1. 0
2. 4
3. 2
4. 3

Solution :The correct answer is **option 1** i.e. **0**

$$(x + y)^3 + 8(x - y)^3$$

$$(x + y)^3 + (2x - 2y)^3$$

$$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$$

$$(x + y + 2x - 2y)[(x + y)^2 + (2x - 2y)^2 - (x + y)(2x - 2y)]$$

$$(3x - y)[(x^2 + y^2 + 2xy + 4x^2 + 4y^2 - 8xy - 2x^2 + 2xy - 2xy + 2y^2)]$$

$$(3x - y)[3x^2 + 7y^2 - 6xy] = (3x + Ay)(3x^2 + Bxy + Cy^2)$$

on comparing we get,

$$A = -1, B = -6 \text{ and } C = 7$$

$$A + B + C = -1 - 6 + 7 = 0.$$

Question 3 :If $\cos(2 + 54^\circ) = \sin, 0^\circ(2 + 54^\circ) 90^\circ$, then what is the value of $(\tan 5 \text{ heta} + \operatorname{cosec} \frac{5 \text{ heta}}{2})$?**Difficulty : Moderate****Average Time : 73 Seconds****Options :**

1. 32
2. 2-3
3. 23
4. 2+3

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**Solution :**

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

Here it is given that,

$$\cos(2 + 54^\circ) = \sin$$

$$\sin(90 - 2 - 54^\circ) = \sin$$

$$-2 + 36 =$$

$$3 = 36$$

$$= 12^\circ$$

$$\tan 5 = \tan 60 = 3$$

$$\operatorname{Cosec} 5/2 = \operatorname{Cosec} 30^\circ = 2$$

$$\text{Now, } \left(\frac{1}{\tan 5\theta} + \operatorname{cosec} \frac{5\theta}{2} \right) = \frac{1}{\sqrt{3} + 2}$$

On rationalizing further we get,

$$= (2 - 3)/(4 - 3)$$

$$= (2 - 3).$$

Question 4 :

The circumference of the base of a right circular cone is 44 cm and its height is 24 cm. The curved surface area (in cm²) of the cone is: (Take $\pi = \frac{22}{7}$)

Difficulty : Moderate

Average Time : 59 Seconds

Options :

1. 528

2. 572

3. 550

4. 440

Solution :

The correct answer is **option 3** i.e. **550**.

Circumference of the base = $2r = 44$ cm.

$r = 7$ cm.

slant height = $\sqrt{7^2 + 24^2} = 25$ cm.

CSA of cone = $rl = 22/7 \times 7 \times 25 = 550$ cm².

Question 5 :

The value of $(\tan^2 A + \cot^2 A - 2) - \sec^2 A \operatorname{cosec}^2 A$ is :

Difficulty : Moderate

Average Time : 47 Seconds

Options :

1. -4
2. -1
3. 1
4. 4

Solution :

The correct answer is **option 1** i.e. **-4**

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

$$(\sin^2 A / \cos^2 A + \cos^2 A / \sin^2 A - 2) - 1 / \sin^2 A \cos^2 A$$

$$((\sin^4 A + \cos^4 A - 2\sin^2 A \cos^2 A) / \sin^2 A \cos^2 A) - 1 / \sin^2 A \cos^2 A$$

$$((\sin^4 A + \cos^4 A - 2\sin^2 A \cos^2 A + 2\sin^2 A \cos^2 A - 2\sin^2 A \cos^2 A) / \sin^2 A \cos^2 A) - 1 / \sin^2 A \cos^2 A$$

$$((\sin^4 A + \cos^4 A + 2\sin^2 A \cos^2 A - 4\sin^2 A \cos^2 A) / \sin^2 A \cos^2 A) - 1 / \sin^2 A \cos^2 A$$

$$(1 - 4\sin^2 A \cos^2 A - 1) / \sin^2 A \cos^2 A$$

-4.

Question 6 :

The average of twenty-five number is 54. The average of the first 13 numbers and that of the last 13 numbers is 52.8 and 62.2, respectively. If the 13th number is excluded, then what is the average of the remaining numbers (correct to one decimal place)?

Difficulty : Moderate

Average Time : 91 Seconds

Options :



50.6

2. 49.8

3. 51.2

4. 50.2

Solution :

The correct answer is **option 4** i.e. **50.2**

Average = Sum of observation/ No. of observation.

Sum of twenty five numbers = $25 \times 54 = 1350$.

Sum of first 13 numbers = $13 \times 52.8 = 686.4$

Sum of last 13 numbers = $13 \times 62.2 = 808.6$

13th number = $686.4 + 808.6 - 1350$
= 145.

Average of the number when 13th number is excluded,
= $(1350 - 145)/24 = 50.2$.

Question 7 :

$(\frac{\sin^2 \theta}{\cos \theta (1 + \cos \theta)} + \frac{1 + \cos \theta}{\cos \theta}) = ?$

Difficulty : Moderate

Average Time : 44 Seconds

Options :

1. cosec

2. sec

3. 2 cos

4. 2sec

Solution :

The correct answer is **option 4** i.e. **2sec**

$(1 - \cos^2)/(\cos(1 + \cos) + (1 + \cos)/\cos)$

$$(1 - \cos)/\cos + (1 + \cos)/\cos$$

$$2/\cos$$

2sec.

Question 8 :

In $\triangle ABC$, D is a point on side BC such that $\angle ADC = 2\angle BAD$. If $\angle A = 80^\circ$ and $\angle C = 38^\circ$, then what is the measure of $\angle ADB$?

Difficulty : Moderate

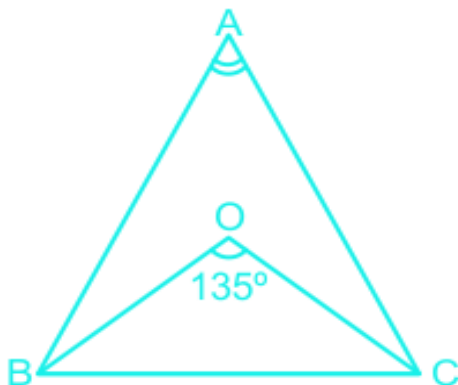
Average Time : 54 Seconds

Options :

1. 58°
2. 62°
3. 52°
4. 56°

Solution :

The correct answer is **option 4** i.e. 56°



We know that the sum of all the angles of a triangle is equal to 180°

$$A + B + C = 180$$

$$B = 180 - 38 - 80 = 62.$$

$$\angle ADC = \angle BAD + \angle ABD$$

$$2\theta = \theta + 62$$

$$\theta = 62.$$



In $\triangle ABC$,

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

$$\angle C = 180^\circ - 62^\circ - 62^\circ = 56^\circ.$$

Question 9 :

To do a certain work, the ratio of the efficiencies of A and B is 7 : 5. Working together, they can complete the same work in $17\frac{1}{2}$ days. A alone will complete 60% of the same work in :

Difficulty : Moderate

Average Time : 67 Seconds

Options :

1. 18 days
2. 15 days
3. 16 days
4. 21 days

Solution :

The correct answer is **option 1** i.e. **18 days**

Let the efficiency of A and B is $7x$ and $5x$.

Total work = Number of days \times total efficiency

$$\text{Total work} = 17\frac{1}{2} \times 12x$$

$$= 210x$$

$$60\% \text{ of work} = 210 \times 60\% = 126x.$$

$$\text{Time taken by A to finish } 126x \text{ units of work} = \frac{126x}{7x} = 18 \text{ days.}$$

Question 10 :

In what ratio should sugar costing Rs 40 per kg be mixed with sugar costing Rs 48 per kg, so as to earn a profit of 20% by selling the mixture at Rs 54 per kg?

Difficulty : Moderate

Average Time : 50 Seconds

Options :

1. 3 : 5
2. 4 : 7

5 : 8

4. 2 : 3

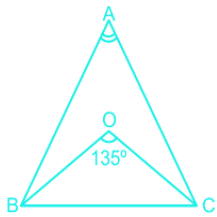
Solution :

The correct answer is **option 1** i.e. **3 : 5**

On selling a mixture one gets 20% profit.

CP of the mixture = $54 \times 100/120 = 45$ per/kg.

By using alligation we get,



Required ratio = 3 : 5.

Question 11 :

From the top of a hill 240 m high, the angles of depression of the top and bottom of a pole are 30° and 60° , respectively. The difference (in cm) between the heights of the pole and its distance from the hill is:

Difficulty : Moderate

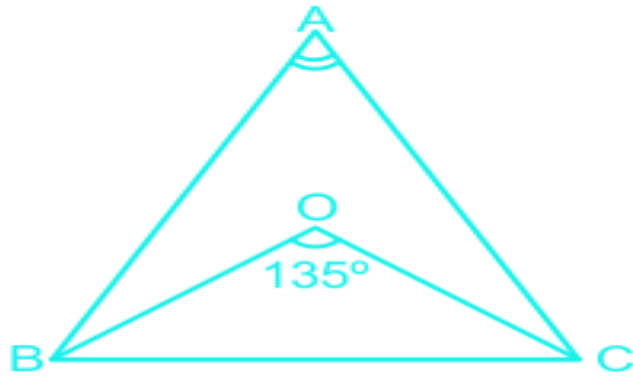
Average Time : 51 Seconds

Options :

1. 120(2-3)
2. 120(3-1)
3. 80(3-1)
4. 80(2-3)

Solution :

The correct answer is **option 4** i.e. **80(2-3)**



In $\triangle ABC$,

$$\tan 60 = AB/AC$$

$$3 = 240/AC$$

$$AC = 80$$

In $\triangle ADE$,

$$\tan 30 = AE/DE$$

$$1/3 = (240 - h)/80$$

$$240 - h = 80$$

$$h = 160$$

$$\text{Required difference} = 160 - 80$$

$$= 80(2 - 3).$$

Question 12 :

If $(\sqrt{11 - 3\sqrt{8}}) = a + b^2$, then what is the value of $(2a + 3b)$?

Difficulty : Moderate

Average Time : 56 Seconds

Options :

1. 7

2. 9

3. 3

4. 5

**Solution :**

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

$11 - 3\sqrt{8}$ can be written as $(9 + 2 - 2 \times 3 \times \sqrt{2})$

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

$$= \sqrt{11 - 3\sqrt{8}} = (3 - \sqrt{2})$$

$$(3 - \sqrt{2}) = a + b^2$$

On comparing we get,

$$a = 3 \text{ and } b = -1.$$

$$(2a + 3b) = 2 \times 3 + 3 \times -1 = 3.$$

Question 13 :

The number of students in section A and section B of a class are 40 and 52, respectively. The average score in mathematics of all the students is 75. If the average score of the students in A is 20% more than that of students in B, then what is the average score of students in B ?

Difficulty : Moderate**Average Time : 62 Seconds****Options :**

1. 71

2. 65

3. 69

4. 63

Solution :

The correct answer is **option 3** i.e. **69**

We know that,

Average = Sum of observation/ no of observation.

The average score of the students in A is 20% more than that of students in B

Let the average score of A and B be $6x$ and $5x$.

Now according to the question.

$$40 \times 6x + 52 \times 5x = 92 \times 75$$



$$240x + 260x = 6900$$

$$500x = 6900$$

$$x = 6900/500 = 69/5.$$

$$5x = 69/5 \times 5 = 69.$$

Question 14 :

A dealer marks his goods at 40% above the cost price. He sells 60% of the goods at the marked price giving 10% discount and the rest by giving 50% discount on the marked price. What is his overall profit/loss percent?

Difficulty : Moderate**Average Time : 56 Seconds****Options :**

1. Loss 2.8%
2. Profit 2.8%
3. Profit 3.6%
4. Loss 3.6%

Solution :

The correct answer is **option 3** i.e. **Profit 3.6%**

Let the customer have 100a items and the CP of each item is 100b.

$$\text{MP of each item} = 100b \times 140\% = 140b.$$

He sells 60% of the goods at the marked price giving 10% discount and the rest by giving 50% discount on the marked price.

$$\text{The selling price of } 60a \text{ items at the rate of } 126b = 60a \times 126b = 7560ab.$$

$$\text{The selling price of } 40a \text{ items at the rate of } 70b = 2800ab.$$

$$\text{CP of } 100a \text{ items at the rate of } 100b = 10000ab.$$

$$\text{Total SP} = 7560ab + 2800ab = 10360ab.$$

$$\text{Profit} = 10360ab - 10000ab = 360ab.$$

$$\text{Profit}\% = 360ab/10000ab \times 100 = 3.6\%.$$

Comprehension :

Study the pie-chart and answer the question:- Break up (degree wise) of students in terms of specialization in different



areas (A,B,C,D & E) In an MBA Program

Question 15 :

The total number of students specializing in A and B exceeds the total number of students specializing in C and D by x, which lies between:

Difficulty : Moderate

Average Time : 73 Seconds

Options :

1. 60 and 65
2. 55 and 60
3. 50 and 55
4. 65 and 70

Solution :

The correct answer is **option 1** i.e. **60 and 65**

The total number of students specializing in A and B = $(61.2 + 75.6)/360 \times 2100 = 798$.

The total number of students specializing in C and D = $(54 + 72)/360 \times 2100 = 735$

Required difference = $798 - 735 = 63$.

Question 16 :

The circumference of the base of a cylindrical vessel is 158.4 cm and its height is 1 m. How many liters of water can it hold (correct to one decimal place)? (Take $\pi = \frac{22}{7}$)

Difficulty : Moderate

Average Time : 45 Seconds

Options :

1. 186.4
2. 200.8
3. 198.2
4. 199.6

Solution :

The correct answer is **option 4** i.e. **199.6**



The circumference of the base of a cylindrical vessel is 158.4 cm

$$2r = 158.4$$

$$r = 25.2 \text{ cm}$$

The volume of the vessel = r^2h

$$22/7 \times 25.2 \times 25.2 \times 100 = 199584 \text{ cm}^3$$

$$1 \text{ cm}^3 = 1 \text{ ml}$$

$$199584 \text{ cm}^3 = 199584 \text{ ml} = 199.6 \text{ litre.}$$

Question 17 :

A hemispherical tank full of water is emptied by a pipe at the rate of 7.7 liters per second. How much time (in hours) will it take to empty $\frac{2}{3}$ part of the tank, if the internal radius of the tank is 10.5m?

Difficulty : Moderate

Average Time : 61 Seconds

Options :

1. $\frac{185}{3}$

2. $\frac{185}{6}$

3. $\frac{175}{3}$

4. $\frac{175}{2}$

Solution :

The correct answer is **option 3** i.e. $\frac{175}{3}$.

$$\text{Volume of the hemisphere} = \frac{2}{3} \times \frac{4}{3} \times \pi \times 10.5 \times 10.5 \times 10.5 = 2425.5 \text{ m}^3$$

$$1 \text{ m}^3 = 1000 \text{ l}$$

$$\text{Total quantity of the tank} = 2425.5 \times 1000 = 2425500 \text{ litres.}$$

$$\frac{2}{3} \text{ of the capacity of the tank} = \frac{2}{3} \times 2425500 = 1617000.$$

$$\text{Time is taken by the tank to empty } \frac{2}{3} \text{ of the tank} = \frac{1617000}{7.7} = \frac{175}{3} \text{ hours.}$$

Question 18 :

A cylindrical roller made of iron is 1.2 m long. Its internal radius is 24 cm and thickness of the iron sheet used in making the roller is 15 cm. What is the mass (in kg) of the roller, if 1 cm³ of iron has 8g mass?



Difficulty : Moderate

Average Time : 58 Seconds

Options :

1. 846.72
2. 845.75
3. 892.8
4. 907.2

Solution :

The correct answer is **option 4** i.e. **907.2**

Inner radius = 24 cm.

Outer radius = 24 + 15 = 39 cm.

The volume of the roller = $(R^2 - r^2)h$

$$(39^2 - 24^2) \times 120 = (63 \times 15) \times 120 = 113400.$$

$$\text{Mass of the roller in kg} = (113400 \times 8)/1000 = 907.2$$

Question 19 :

The rate of interest for the first 2 years is 6% p.a. for the next 3 years is 10% p.a. and for the period beyond 5 years is 12% p.a. If a person gets Rs 12, 771 as simple interest after 7 years, then how much money did he invest?

Difficulty : Moderate

Average Time : 67 Seconds

Options :

1. Rs 20,000
2. Rs 19,350
3. Rs 19,450
4. Rs 19,300

Solution :

The correct answer is **option 2** i.e. **Rs 19,350**.

Let the Principal is 'p' then,

$$2 \text{ years} = 2 \times 6 = 12\%$$

$$3 \text{ years} = 3 \times 10\% = 30\%$$

$$2 \text{ years} = 2 \times 12 = 24\%$$

Total interest received in 7 years = $12 + 30 + 24 = 66\%$ of the initial principal.

$$66\% = 12771$$

$$100\% = 12771/66 \times 100 = 19350.$$

Comprehension :

Study the given graph and answer the question that follows.

Question 20 :

By what percent were the total exports of computers, by the company, in 2013,2014 and 2018 less than the total production of computers from 2015 to 2017 (correct to one decimal place)?

Difficulty : Moderate

Average Time : 50 Seconds

Options :

1. 28.5
2. 32.6
3. 43.1
4. 30.1

Solution :

The correct answer is **option 4** i.e. **30.1**

The total exports of computers, by the company, in 2013,2014 and 2018 = $140 + 240 + 270 = 650$

The total production of computers in 2015 to 2017 = $300 + 340 + 290 = 930$.

Required % = $(930 - 650)/930 \times 100 = 30.1\%$

Comprehension :

Study the given graph and answer the question that follows.

Question 21 :



The number of weeks, in which the cost of living index was 160 or more but less than 190, is approximately what percent more than the number of weeks in which the cost of living index was 200 or more but less than 220 (correct to one decimal place)?

Difficulty : Moderate

Average Time : 51 Seconds

Options :

1. 58.3
2. 36.8
3. 60.6
4. 44.4

Solution :

The correct answer is **option 1** i.e. **58.3**.

The number of weeks, in which the cost of living index was 160 or more but less 190 = 4 + 6 + 9 = 19.

The number of weeks, in which the cost of living index was 200 or more but less than 220 = 7 + 5 = 12

required % = $(19 - 12)/12 \times 100 = 58.3\%$.

Question 22 :

The value of $(\frac{7 + 3\sqrt{5}}{3 + \sqrt{5}} - \frac{7 - 3\sqrt{5}}{3 - \sqrt{5}})$ lies between:

Difficulty : Moderate

Average Time : 42 Seconds

Options :

1. 3 and 3.5
2. 2 and 2.5
3. 1.5 and 2
4. 2.5 and 3

Solution :

The correct answer is **option 2** i.e. **2 and 2.5**

$$\left(\frac{7 + 3\sqrt{5}}{3 + \sqrt{5}} - \frac{7 - 3\sqrt{5}}{3 - \sqrt{5}}\right)$$

$$\left(\frac{(7 + 3\sqrt{5})(3 - \sqrt{5}) - (7 - 3\sqrt{5})(3 + \sqrt{5})}{(3 + \sqrt{5})(3 - \sqrt{5})}\right)$$

$$\left(\frac{6 + 2\sqrt{5} - 6 + 2\sqrt{5}}{4}\right)$$

$$(\sqrt{5}) = 2.23$$

Question 23 :

A and B enter into a partnership with capital in the ratio 5 : 6. After 4 months, A withdraws $\left(\frac{1}{5}\right)$ of his capital, while B increases his capital by $33\left(\frac{1}{3}\right)\%$. What is the share (in Rs lakhs) of B in the annual profit of Rs 6.3 lakhs?

Difficulty : Moderate**Average Time : 66 Seconds****Options :**

1. 2.34
2. 3.96
3. 2.61
4. 3.69

Solution :

The correct answer is **option 2** i.e. **3.96**.

Here the initial ratio of investment of A and B is given which is 5 : 6.

Let the initial investment of A and B be $5x$ and $6x$.

We know that,

Profit share = Investment \times time period.

Profit share of A = $5x \times 4 + 4x \times 8 = 52x$.

Profit share of B = $6x \times 4 + 8x \times 8 = 88x$

Ratio of their profit share = $52x : 88x = 13 : 22$.

Share of B in 6.3 lakh = $\frac{22}{35} \times 6.3 = 3.96$ lakhs.

Question 24 :

In $\triangle ABC$, right-angled at B, if $\tan A = \left(\frac{1}{2}\right)$, then the value of $\frac{(\sin A(\cos C + \cos A))}{(\cos C(\sin C - \sin A))}$ is:

Difficulty : Moderate**Average Time : 55 Seconds****Options :**

1. 2

1

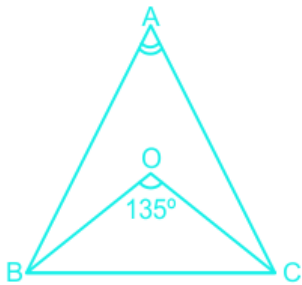
3. 3

4. 25

Solution :

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

$$\tan A = \frac{1}{2} = p/b$$



$$\text{Hypotenuse} = \sqrt{2^2 + 1^2} = \sqrt{5}$$

$$\sin A = \frac{1}{\sqrt{5}}$$

$$\sin C = \frac{2}{\sqrt{5}}$$

$$\cos A = \frac{2}{\sqrt{5}}$$

$$\cos C = \frac{1}{\sqrt{5}}$$

Put the respective values, we get,

$$= \frac{1}{\sqrt{5}} \left(\frac{1}{\sqrt{5}} + \frac{2}{\sqrt{5}} \right) \left[\frac{1}{\sqrt{5}} \left(\frac{2}{\sqrt{5}} - \frac{1}{\sqrt{5}} \right) \right]$$

$$= 3$$

Question 25 :

When positive numbers a, b and c are divided by 13, the remainders are 9, 7 and 10, respectively. What will be the remainder when $(a + 2b + 5c)$ is divided by 13?

Difficulty : Moderate

Average Time : 70 Seconds

Options :

1. 8

2. 9



5

4. 10

Solution :

The correct answer is **option 1** i.e. **8**

It is given that,

$$a/13 = \text{Rem is } 9.$$

$$b/13 = \text{Rem is } 7$$

$$c/13 = \text{Rem is } 10$$

here we have infinite values of a, b and c.

Let a = 9, b = 7 and c = 10(no condition violates)

$$(a + 2b + 5c) = 9 + 14 + 50 = 73$$

$$73/13 = \text{Rem is } 8.$$

Comprehension :

Study the pie - chart and answer the option Break up (degree wise) of students in terms of specialization in different areas (A,B,C,D & E) In an MBA Program

Question 26 :

If the ratio of male and female students specializing in B is 4 : 3 and that of male and female students specializing in D is 8 : 7, then the number of female students in D is what percent less than the number of male students in B (correct to one decimal place)?

Difficulty : Moderate**Average Time : 62 Seconds****Options :**

1. 41.7

2. 40.2

3. 55.8

4. 71.4

Solution :

The correct answer is **option 1** i.e. **41.7**



Number of people specializing in B = $75.6/360 \times 2100 = 441$.

The ratio of male and female students specializing in B is 4 : 3

Male student = $4/7 \times 441 = 252$

Female students = $441 - 252 = 189$

Number of people specializing in D = $54/360 \times 2100 = 315$.

The ratio of male and female students specializing in D is 8 : 7

Male student = $8/15 \times 315 = 168$

Female student = 147

Required percentage = $(252 - 147)/252 \times 100 = 41.7\%$

Question 27 :

A train travelling at 36 km/hr crosses a pole in 25 sec. How much time (in sec) will it take to cross a bridge 350 m long?

Difficulty : Moderate

Average Time : 52 Seconds

Options :

1. 72

2. 48

3. 60

4. 56

Solution :

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

Speed = $36\text{km/hr} = 36 \times 5/18 = 10\text{m/sec}$.

Distance travelled by the train in 25 sec is nothing but the length of the train,

= $25 \times 10 = 250\text{m}$.

Time is taken by train to cross a bridge of 350m,

= $(250 + 350)/10 = 60 \text{ sec}$.

Question 28 :

$(\frac{25}{100} \text{ of } (\frac{50}{100} \text{ of } (\frac{30}{100} \text{ of } 150))) \{ \frac{40}{100} \text{ of } 2250 \}$ is equal to:



Difficulty : Moderate

Average Time : 40 Seconds

Options :

1. 0.625%
2. 0.225%
3. 0.825%
4. 0.25%

Solution :

The correct answer is **option 1** i.e. **0.625%**.

$$25\% = 1/4$$

$$50\% = 1/2$$

$$30\% = 3/10$$

$$40\% = 2/5$$

$$= [1/4 \times (1/2 \times 3/10 \times 150)]/[2/5 \times 2250]$$

$$= (5.625)/(900) \times 100 = 0.625\%.$$

Question 29 :

What price should Neeraj mark on a shirt that costs Rs 840, so as to earn a profit of 18% after allowing a discount of 16% on the marked price?

Difficulty : Moderate

Average Time : 39 Seconds

Options :

1. Rs 1,200
2. Rs 1,180
3. Rs 1,240
4. Rs 1,160

Solution :

The correct answer is **option 2** i.e. **Rs 1,180**



CP = 840

SP of the shirt at the profit of 18% = $840 \times 118\% = 991.2$

MP of the shirt at the discount of 16% = $991.2 \times 100/84 = 1180$.

Question 30 :

If $x - \frac{1}{x} = 5$, $x \neq 0$, then what is the value of $\frac{x^6 + 3x^3 - 1}{x^6 - 8x^3 - 1}$?

Difficulty : Moderate

Average Time : 41 Seconds

Options :

1. $\frac{3}{8}$
2. $\frac{13}{12}$
3. $\frac{4}{9}$
4. $\frac{11}{13}$

Solution :

The correct answer is **option 2** i.e. $\frac{13}{12}$

$$x - \frac{1}{x} = 5.$$

On cubing both sides we get,

$$x^3 - \frac{1}{x^3} - 3(x - \frac{1}{x}) = 125$$

$$x^3 - \frac{1}{x^3} = 140$$

$$\frac{x^6 + 3x^3 - 1}{x^6 - 8x^3 - 1},$$

On dividing the numerator and denominator by x^3 we get,

$$= \frac{(x^3 - \frac{1}{x^3} + 3)}{(x^3 - \frac{1}{x^3} - 8)}$$

$$= \frac{(140 + 3)}{(140 - 8)}$$

$$= \frac{143}{132}$$

$$= \frac{13}{12}.$$

Question 31 :

Alloy A contains metals x and y only in the ratio 5 : 2 and alloy B contains these metals in the ratio 3 : 4 alloy C is prepared by mixing A and B in the ratio 4 : 5. The percentage of x in alloy C is:

Difficulty : Moderate

Average Time : 74 Seconds

Options :

1. 45
2. $55\left(\frac{5}{9}\right)$
3. $44\left(\frac{4}{9}\right)$
4. 56

Solution :

The correct answer is **option 2** i.e. $55\left(\frac{5}{9}\right)$

	x	y	Total
A	5 units	2 units	7 units
B	3 units	4 units	7 units

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

Respective quantities of A and B becomes

	x	y	Total
A	20 units	8 units	28 units
B	15 units	20 units	35 units

Total x in C = 20 + 15 = 35

Total y in C = 8 + 20 = 28.

% of x in C = $\frac{35}{63} \times 100 = 55.55\%$

Question 32 :

The value of $\left(\frac{5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ}{\tan^2 60^\circ - \sin^2 30^\circ - \cos^2 45^\circ}\right)$ is:

Difficulty : Moderate

Average Time : 74 Seconds

Options :

1. $\left(\frac{67}{27}\right)$
2. $\left(\frac{22}{9}\right)$

$$\left(\frac{67}{24}\right)$$

4. $\left(\frac{19}{9}\right)$

Solution :

The correct answer is **option 1** i.e. $\left(\frac{67}{27}\right)$

One can solve this question by directly placing the values of trigonometric ratios.

$$= (5 \times 1/4 + 4 \times 4/3 - 1)/(3 - 1/4 - 1/2)$$

$$= (5/4 + 16/3 - 1)/(18/8)$$

$$= (67/12)/(18/8)$$

$$= 67/27.$$

Question 33 :

If $X = \sec 57^\circ$, then $\cot^2 33^\circ + \sin^2 57^\circ + \sin^2 33^\circ + \operatorname{cosec}^2 57^\circ \cos^2 33^\circ + \sec^2 33^\circ \sin^2 57^\circ$ is equal to:

Difficulty : Moderate

Average Time : 48 Seconds

Options :

1. $2x^2 + 1$

2. $\frac{1}{x^2 + 1}$

3. $x^2 + 1$

4. $x^2 + 2$

Solution :

The correct answer is **option 4** i.e. $x^2 + 2$.

$$\cot^2 33^\circ + \sin^2 57^\circ + \sin^2 33^\circ + \operatorname{cosec}^2 57^\circ \cos^2 33^\circ + \sec^2 33^\circ \sin^2 57^\circ$$

$$\cot^2 33^\circ + \sin^2 57^\circ + \cos^2 57^\circ + \sec^2 33^\circ \cos^2 33^\circ + \operatorname{cosec}^2 57^\circ \sin^2 57^\circ$$

$$\cos^2 33^\circ / \sin^2 33^\circ + 1 + 1 + 1$$

$$(1 - \sin^2 33^\circ) / \sin^2 33^\circ + 3$$

$$= \operatorname{cosec}^2 33^\circ - 1 + 3$$

$$= \sec^2 57^\circ + 2$$
$$= x^2 + 2.$$

Question 34 :

Reshma buys two articles A and B for Rs 1,734. She sells A at a loss of 16% and sells B at a gain of 20%. The selling price of both the articles is the same. If A is sold for Rs 1,147.50, then the gain percent on A is:

Difficulty : Moderate

Average Time : 78 Seconds

Options :

1. 12.5
2. 12
3. 10.5
4. 10

Solution :

The correct answer is **option 1** i.e. **12.5%**

She sells A at a loss of 16%.

$$16\% = 16/100$$

CP is 100 then SP will become 84.....(1)

She sells B at a gain of 20%.

$$20\% = 20/100$$

CP is 100 then SP = 120.....(2)

SP is the same in both cases.

Multiply the first case by 10 and second by 7 we get,

$$CP_1 = 1000 \text{ and } SP_1 = 840$$

$$CP_2 = 700 \text{ and } SP_2 = 840$$

$$1700 \text{ units} = 1734$$

$$1 \text{ units} = 1.02$$

$$CP \text{ of A} = 1000 \times 1.02 = 1020$$



SP of A = 1147.5

Profit = 1147.5 - 1020 = 127.5

Profit% = $127.5/1020 \times 100 = 12.5\%$

Question 35 :

A shopkeeper bought 20 kg of rice at Rs 55 per kg, 25 kg of rice at Rs 50 per kg, and 35 kg of rice at Rs 60 per kg. he spent a sum of Rs 150 on transportation. He mixed all the three types of rice and sold all the stock at Rs 62.56 per kg. His profit percent in the entire transaction is:

Difficulty : Moderate

Average Time : 68 Seconds

Options :

1. 8.8
2. 12.5
3. 10.5
4. 9.2

Solution :

The correct answer is **option 1** i.e. **8.8**

Total price of 20 kg of rice at Rs 55 per kg = $20 \times 55 = 1100$

Total price of 25 kg of rice at Rs 50 per kg = $25 \times 50 = 1250$

Total price of 35 kg of rice at Rs 60 per kg = $35 \times 60 = 2100$

Total cost = $1100 + 1250 + 2100 + 150 = 4600$.

Total quantity = $20 + 25 + 35 = 80\text{kg}$.

Total SP = $62.56 \times 80 = 5004.8$

Profit = $5004.8 - 4600 = 404.8$

P = 404.8

Profit % = $404.8/4600 \times 100 = 8.8\%$.

Question 36 :

If $\text{cosec } \theta = b/a$, then $(\frac{\sqrt{3}\cot \theta + 1}{\tan \theta + \sqrt{3}})$ is equal to:

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

1. $\frac{\sqrt{b^2 - a^2}}{b}$
2. $\frac{\sqrt{b^2 - a^2}}{a}$
3. $\frac{\sqrt{a^2 + b^2}}{a}$
4. $\frac{\sqrt{a^2 + b^2}}{b}$

Solution :

The correct answer is **option 2** i.e. $\frac{\sqrt{b^2 - a^2}}{a}$

$\operatorname{cosec} = b/a = \text{hypotenuse/perpendicular}$

$(\text{base}) = \sqrt{b^2 - a^2}$

$\operatorname{Cot} = \text{base/perpendicular} = \sqrt{b^2 - a^2}/a$

$\operatorname{Tan} = \text{perpendicular/base} = a/\sqrt{b^2 - a^2}$.

$\frac{\sqrt{3}\cot\theta + 1}{\tan\theta + \sqrt{3}}$

$= \frac{\sqrt{3} \times \operatorname{Cot} \theta + 1}{\frac{1}{\operatorname{Cot} \theta} + \sqrt{3}}$

$= \operatorname{Cot} \theta = \sqrt{b^2 - a^2}/a$.

Question 37 :

When x is subtracted from each of 19, 28, 55 and 91, the numbers so obtained in this order, are in proportion. What is the mean proportion between $(x + 9)$ and x^2 ?

Difficulty : Moderate**Average Time : 76 Seconds****Options :**

1. 27
2. 32
3. 28
4. 24

Solution :

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

According to the question,

$$(19 - x) : (28 - x) :: (55 - x) : (91 - x)$$

product of extremes = product of means.

$$(19 - x) \times (91 - x) = (55 - x) \times (28 - x)$$

$$1729 - 19x - 91x + x^2 = 1540 - 55x - 28x + x^2$$

$$-110x + 1729 = 1540 - 83x$$

$$27x = 189$$

$$x = 7$$

Mean proportion of a and b is \sqrt{ab} .

$$= \sqrt{(7 + 9)(7^2)} = 28.$$

Question 38 :

A solid metallic cuboid of dimensions 18 cm × 36 cm × 72 cm is melted and recast into 8 cubes of the same volume. What is the ratio of the total surface area of the cuboid to the sum of the lateral surface areas of all 8 cubes?

Difficulty : Moderate

Average Time : 62 Seconds

Options :

1. 4 : 7
2. 7 : 8
3. 7 : 12
4. 2 : 3

Solution :

The correct answer is **option 2** i.e. **7 : 8**.

In this case, the volume remains constant.

The volume of cuboid = volume of 8 cubes.

$$18 \times 36 \times 72 = 8 \times a^3$$

$$a = 18.$$

$$\text{Total surface area of cuboid} = 2(18 \times 36 + 36 \times 72 + 72 \times 18) = 2(648 + 2592 + 1296)$$

$$= 9072\text{cm}^2$$

LSA of cube = $8 \times 4 \times 18 \times 18 = 10368\text{cm}^2$.

Required ratio = $9072 : 10368 = 7 : 8$.

Question 39 :

If the radius of a sphere is increased by 2.5 decimetre (dm), then its surface area increases by 110 dm². What is the volume (in dm³) of the sphere?

Difficulty : Moderate

Average Time : 50 Seconds

Options :

1. $\frac{13}{21}$
2. $\frac{3}{7}$
3. $\frac{4}{7}$
4. $\frac{11}{21}$

Solution :

The correct answer is **option 4** i.e. $\frac{11}{21}$

Let the initial and final radius be 'r' and 'R',

$$R - r = 2.5 \dots\dots\dots(1)$$

Increase in their surface area = 110

$$4\pi(R^2 - r^2) = 110$$

$$4 \times \frac{22}{7} \times (R + r)(R - r) = 110$$

$$(R + r)(R - r) = 8.75$$

$$(R + r) = 3.5 \dots\dots\dots(2)$$

On solving 1 and 2 we get,

$$R = 3 \text{ and } r = 0.5$$

$$\text{Volume of the sphere} = \frac{4}{3} \times \frac{22}{7} \times 0.5^3 = \frac{11}{21} \text{ dm}^3.$$

Question 40 :

Study the pie - chart and answer the question:- Break up (degree wise) of students in terms of specialization in different areas (A,B,C,D & E) In an MBA Program The number of students specializing in E is what percent more than that of



students specializing in C?

Difficulty : Moderate

Average Time : 69 Seconds

Options :

1. 25.9
2. 30.4
3. 32
4. 35

Solution :

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

The number of students specializing in E = $97.2/360 \times 2100 = 567$.

The number of students specializing in C = $72/360 \times 2100 = 420$.

Required% = $(567 - 420)/420 \times 100 = 35\%$.

Question 41 :

A sum of Rs 10,500 amounts to Rs 13,650 in 2 years at a certain rate percent per annum simple interest. The same sum will amount to what in 1 year at the same rate if the interest is compound half-yearly (nearest to Rs 1)?

Difficulty : Moderate

Average Time : 44 Seconds

Options :

1. Rs 12,124
2. Rs 12,134
3. Rs 12,143
4. Rs 12,314

Solution :

The correct answer is **option 2** i.e. **Rs 12,134**.

A sum of Rs 10,500 amounts to Rs 13,650 in 2 years.

2 years interest = $13650 - 10500 = 3150$

Yearly interest = $3150/2 = 1575$.

Rate of interest = $1575/10500 \times 100 = 15\%$.

According to the question,

$$A = 10500(1 + 7.5/100)^2$$

$$A = 12134$$

Question 42 :

A boat can go 5 km upstream and $7\frac{1}{2}$ km downstream in 45 minutes. It can also go 5 km downstream and 2.5 km upstream in 25 minutes. How much time (in minutes) will it take to go 6 km upstream?

Difficulty : Moderate

Average Time : 47 Seconds

Options :

1. 30

2. 36

3. 24

4. 32

Solution :

The correct answer is **option 2** i.e. **36**

Speed during upstream = a km/hr

Speed during downstream = b km/hr

According to the question,

$$5/a + 7.5/b = 3/4 \dots\dots\dots(1)$$

$$5/b + 2.5/a = 25/60 = 5/12 \dots\dots\dots(2)$$

On multiplying the second equation by 2 we get,

$$10/b + 5/a = 10/12 \dots\dots\dots(3)$$

Subtract eq 1 from 3 we get,

$$2.5/b = 1/12$$

$$b = 30 \text{ km/hr}$$

On putting the value of b in eq 1 we get,

$a = 10 \text{ km/hr.}$

Required time = $6/10 \times 60 = 36$ minutes.

Question 43 :

If the five-digit number 235xy is divisible by 3, 7 and 11, then what is the value of $(3x - 4y)$?

Difficulty : Moderate

Average Time : 53 Seconds

Options :

1. 10
2. 8
3. 9
4. 5

Solution :

The correct answer is **option 1** i.e. **10**

235xy is divisible by three, it means sum of the digits of 235xy is also divisible by 3.

$$2 + 3 + 5 + x + y = 10 + x + y.$$

one can say that, $x + y$ can be 2, 5, 8 and 11.....(1)

235xy is divisible by 11 it means,

$$(7 + y) - (3 + x) = 0, 11$$

$$4 + y - x = 0, 11.....(2)$$

If $y - x = -4$ and $x + y = 8$ then we get $y = 2$ and $x = 6$.

Required number 23562 must be divisible by 7.

$$562 - 023 = 539.$$

539 is divisible by 7.

So $x = 6$ and $y = 2$ satisfied.

$$3x - 4y = 3 \times 6 - 4 \times 2$$

$$= 18 - 8 = 10.$$

Question 44 :

Two men and 7 women can complete a work in 28 days, whereas 6 men and 16 women can do the same work in 11 days. In how many days will 5 men and 4 women, working together, complete the same work?

Difficulty : Moderate

Average Time : 64 Seconds

Options :

1. 20
2. 18
3. 14
4. 22

Solution :

The correct answer is **option 4** i.e. **22**

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

According to the question,

$$(2m + 7w) \times 28 = (6m + 16w) \times 11$$

$$m = 2w \dots (1)$$

From eq 1 we can say that if the efficiency of 1 woman is 1 then the efficiency of 1 man is 2.

$$\text{Total work} = (2 \times 2 + 7 \times 1) \times 28 = 11 \times 28 = 308 \text{ units.}$$

$$\text{Combined efficiency of 5 men and 4 women} = 5 \times 2 + 4 \times 1 = 14$$

$$\text{Time taken} = 308/14 = 22 \text{ days.}$$

Question 45 :

The denominator of a fraction is 4 more than twice the numerator. When the numerator is increased by 3 and the denominator is decreased by 3, the fraction becomes $\frac{2}{3}$, What is the difference between the denominator and numerator of the original fraction?

Difficulty : Moderate

Average Time : 57 Seconds

Options :

1. 13
2. 10
3. 12



11

Solution :

The correct answer is **option 4** i.e. **11**.

Let the fraction be N/D .

$$D = 2N + 4 \dots\dots(1)$$

When the numerator is increased by 3 and the denominator is decreased by 3, the fraction becomes $\frac{2}{3}$,

$$\frac{N + 3}{D - 3} = \frac{2}{3}$$

$$3N = 2D - 15 \dots\dots(2)$$

On solving equation (1) and (2) we get,

$$N = 7 \text{ and } D = 18.$$

$$D - N = 18 - 7 = 11.$$

Question 46 :

The monthly salaries of A and B are the same. A, B and C donate 10%, 8% and 9% respectively, of their monthly salaries to a charitable trust. The difference between the donations of A and B is Rs 400. The total donation by A and B is Rs 900 more than that of C. What is the monthly salary of C?

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

1. Rs 25,000
2. Rs 30,000
3. Rs 27,000
4. Rs 36,000

Solution :

The correct answer is **option 2** i.e. **Rs 30,000**

The salaries of A and B are same.

So let the salary of A , B and C be $100x$, $100x$ and $100y$.

A, B and C donate 10%, 8% and 9% of their salaries.

$$\text{A's donation} = 100x \times 10\% = 10x.$$



$$B's \text{ donation} = 100x \times 8\% = 8x$$

$$C's \text{ donation} = 100y \times 9\% = 9y$$

$$\text{Required difference} = 10x - 8x = 2x.$$

$$2x = 400$$

$$x = 200.$$

$$A's \text{ salary} = 100x = 100 \times 200 = 20000.$$

$$B's \text{ salary} = 20000.$$

The total donation by A and B is Rs 900 more than that of C.

$$10x + 8x - 9y = 900$$

$$9y = 18 \times 200 - 900$$

$$9y = 2700$$

$$y = 300.$$

$$\text{Salary of C} = 100y = 100 \times 300 = 30000.$$

Question 47 :

Let ab , $a b$, is a 2- digit prime number such that ba is also a prime number. The sum of all such numbers is:

Difficulty : Moderate

Average Time : 68 Seconds

Options :

1. 407

2. 418

3. 396

4. 374

Solution :

The correct answer is **option 2** i.e. **418**.

It is hit and trial question one needs to think the digits first then one can find the solution.

All possible digits are, (13, 31) (17, 71) (37, 73) (79, 97)

$$\text{Required sum} = 13 + 31 + 17 + 71 + 37 + 73 + 79 + 97 = 418.$$

**Question 48 :**

An article is marked 25% above its cost price. If x % discount is allowed on the marked price and still there is a profit of 5.5%, then what is the value of x ?

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

1. 16.4
2. 15.4
3. 13.6
4. 15.6

Solution :

The correct answer is **option 4** i.e. **15.6**.

CP of an article is $100x$.

MP = 125% of $100x = 125x$.

SP of an article at the profit of 5.5%.

SP = $100x \times 105.5\% = 105.5x$.

Discount offered = $125x - 105.5x = 19.5x$.

Discount% = $19.5x/125x \times 100 = 15.6\%$

$x = 15.6\%$.

Question 49 :

The value of is:

Difficulty : Moderate**Average Time : 40 Seconds****Options :**

1. 1
2. 0.75
3. 0.25
4. 0.5

Solution :

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

The above equation can be written as,

$$= (27 \times 0.015625 + 125 \times 0.000125)/(0.5625 - 0.125)$$

$$= (0.421875 + 0.015625)/(0.4375)$$

$$= 0.4375/0.4375$$

$$= 1.$$

Question 50 :

The value of $(\sin(\theta) + \cos(\theta) - 1)/(\sin(\theta) - \cos(\theta) + 1) \times (\sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}})$ is:

Difficulty : Moderate

Average Time : 39 Seconds

Options :

1. -2

2. 2

3. -1

4. 1

Solution :

The correct answer is **option 4** i.e. **1**

$$= \frac{\sin \theta + \cos \theta - 1}{\sin \theta - \cos \theta + 1} \times \sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}}$$

on rationalization we get,

$$= \frac{(\sin \theta + \cos \theta - 1) \times (\sin \theta - \cos \theta - 1)}{(\sin \theta - \cos \theta + 1) \times (\sin \theta - \cos \theta - 1)} \times \sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}}$$

$$= \frac{[\sin^2 \theta - \sin \theta \cos \theta - \sin \theta \cos \theta - \cos^2 \theta - \cos \theta + 1]}{(\sin^2 \theta + \cos^2 \theta - 2 \sin \theta \cos \theta - 1)} \times \sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}}$$

$$= \frac{[\sin^2 \theta - \cos^2 \theta - 2 \sin \theta \cos \theta + 1]}{(-2 \sin \theta \cos \theta)} \times \sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}}$$

$$= \frac{[\sin^2 \theta - \cos^2 \theta - 2 \sin \theta \cos \theta + \sin^2 \theta + \cos^2 \theta]}{(-2 \sin \theta \cos \theta)} \times \sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}}$$

$$= \frac{[2 \sin^2 \theta - 2 \sin \theta \cos \theta]}{(-2 \sin \theta \cos \theta)} \times \sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}}$$

$$= \frac{2 \sin \theta (\sin \theta - \cos \theta)}{(-2 \sin \theta \cos \theta)} \times \sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}}$$



$$\begin{aligned} &= (\sin^2(\theta) - 1)/(\cos^2(\theta)) \\ &= -\cos^2(\theta)/\cos^2(\theta) \\ &= -1. \end{aligned}$$

Question 51 :

The base of a solid right prism of height 10 cm is a square and its volume is 160 cm³. What is its total surface area of the prism (in cm²)?

Difficulty : Moderate**Average Time : 172 Seconds****Options :**

1. 200
2. 176
3. 192
4. 180

Solution :

The correct answer is **option 3** i.e. **192**

TSA of prism = CSA of prism + 2 × area of the base.

The volume of the prism = area of base × height.

$$160 = \text{area of the base} \times 10$$

$$\text{Area of the base} = 160/10 = 16.$$

$$\text{Side of the square} = \sqrt{16} = 4.$$

CSA of prism = Perimeter of base × height

$$= 16 \times 10 = 160.$$

$$\text{TSA} = 160 + 2 \times 16$$

$$= 160 + 32 = 192 \text{ cm}^2.$$

Question 52 :

A can-do $\frac{1}{3}$ of work in 30 days. B can do $\frac{2}{5}$ of the same work in 24 days. They worked together for 20 days. C complete the remaining work in 8 days. Working together A, B and C will complete the same work in:



Difficulty : Moderate

Average Time : 58 Seconds

Options :

1. 15 days
2. 10 days
3. 18 days
4. 12 days

Solution :

The correct answer is **option 4** i.e. **18 days**.

A can do $\frac{1}{3}$ of a work in 30 days.

A complete the whole work in $3 \times 30 = 90$ days.

B can do $\frac{2}{5}$ of the same work in 24 days.

B complete the whole work in 60 days.

Total work = LCM of (60 and 90) = 180 units.

Efficiency of A = $180/90 = 2$ units/day.

Efficiency of B = $180/60 = 3$ units/ day.

Work done by A and B in 20 days = $20 \times 5 = 100$ units.

Now C joined them then the work was done in 8 days.

Combined efficiency of A, B and C = $80/8 = 10$ units.

Efficiency of C = $10 - 3 - 2 = 5$ units/day.

Work done by A, B and C together = $180/10 = 18$ days.

Question 53 :

The value of $4 \div 12$ of $[3 \div 4$ of $\{(4 - 2) \times 6 \div 2\}] - 2 \times 6 \div 8 + 3$ is:

Difficulty : Moderate

Average Time : 68 Seconds

Options :

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

$$2\left(\frac{1}{3}\right)$$

4. $7\left(\frac{1}{6}\right)$

Solution :

The correct answer is **option 1** i.e. $4\left(\frac{1}{6}\right)$.

$$4 \div 12 \text{ of } [3 \div 4 \text{ of } \{(4 - 2) \times 6 \div 2\}] - 2 \times 6 \div 8 + 3$$

$$4 \div 12 \text{ of } [3 \div 24] - 2 \times 6 \div 8 + 3$$

$$4 \div \frac{3}{2} - 2 \times 6 \div 8 + 3$$

$$\frac{8}{3} - \frac{6}{4} + 3$$

$$\frac{50}{12} = \frac{25}{6}.$$

Question 54 :

What is the area (in sq. units) of the triangle formed by the graphs of the equations $2x + 5y - 12 = 0$, $x + y = 3$ and $y = 0$?

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

1. 3

2. 2

3. 5

4. 6

Solution :

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

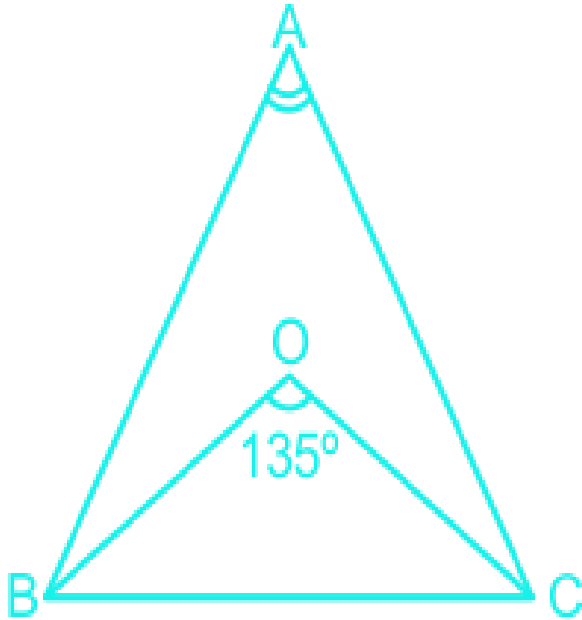
For $2x + 5y = 12$.

x	1	6
y	2	0

For $x + y = 3$.

x	0	3
y	3	0

$y = 0$.



Area of bounded figure = $\frac{1}{2} \times 3 \times 2 = 3 \text{ units}^2$.

Question 55 :

A metallic solid spherical ball of radius 3 cm is melted and recast into three spherical balls. The radii of these balls are 2 cm and 1.5 cm. What is the surface area (in cm^2) of the third ball?

Difficulty : Moderate

Average Time : 64 Seconds

Options :

1. 50
2. $\frac{25}{4}$
3. 25
4. $\frac{25}{2}$

Solution :

The correct answer is **option 3** i.e. **25**.

Let the radius of the third ball be r .

In this case, the volume remains constant.

The volume of big sphere = Sum of the volume of three spheres.

$$\frac{4}{3} \times \pi \times 3 \times 3 \times 3 = \frac{4}{3} \times \pi (2^3 + 1.5^3 + r^3)$$

$$27 = 8 + 3.375 + r^3$$

$$r = 2.5 \text{ cm.}$$

The surface area of the sphere of radius 2.5cm = $4 \times \pi \times 2.5 \times 2.5 = 25\pi$.

Question 56 :

In $\triangle ABC$, D and E are points on the sides AB and AC, respectively, such that $DE \parallel BC$. If $AD = 5 \text{ cm}$, $DB = 9 \text{ cm}$, $AE = 4 \text{ cm}$ and $BC = 15.4 \text{ cm}$, then the sum of the lengths of DE and EC (in cm) is:

Difficulty : Moderate

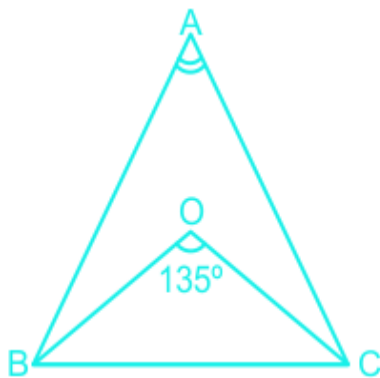
Average Time : 68 Seconds

Options :

1. 11.6
2. 10.8
3. 13.4
4. 12.7

Solution :

The correct answer is **option 4** i.e. **12.7**



Let $DE = x$ and $EC = y$.

$DE \parallel BC$ so we can say that $\triangle ABC$ is similar to $\triangle ADE$ by AA.

$$\frac{AD}{AB} = \frac{DE}{BC} = \frac{AE}{AC}$$





$$5/14 = x/15.4 = 4/4+y$$

On solving further we get,

$$x = 5.5 \text{ and } y = 7.2$$

$$x + y = 5.5 + 7.2 = 12.7.$$

Question 57 :

The base of a right pyramid is an equilateral triangle with side 8 cm, and its height is 303 cm. The volume (in cm³) of the pyramid is:

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

1. 2403
2. 3603
3. 480
4. 360

Solution :

The correct answer is **option 3** i.e. **480**.

The volume of the pyramid = $\frac{1}{3} \times \text{area of base} \times \text{height}$

Area of base = area of an equilateral triangle = $\frac{3}{4} \times 8 \times 8 = 163$.

Volume = $\frac{1}{3} \times 163 \times 303$

$$= 480\text{cm}^3$$

Question 58 :

If $a : b : c = (\frac{1}{4}) : (\frac{1}{3}) : (\frac{1}{2})$, then $(\frac{a}{b}) : (\frac{b}{c}) : (\frac{c}{a}) = ?$

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

1. 12 : 9 : 8
2. 9 : 8 : 24
3. 8 : 9 : 24



9 : 12 : 8

Solution :

The correct answer is **option 2** i.e. **9 : 8 : 24**

$a : b : c = \frac{1}{4} : \frac{1}{3} : \frac{1}{2}$ this can be simplified by multiplying the number by LCM of 4,3 and 2.

$a : b : c = \frac{1}{4} : \frac{1}{3} : \frac{1}{2} \times 12$

$a : b : c = 3 : 4 : 6$.

$a = 3x$, $b = 4x$ and $c = 6x$.

$\frac{a}{b} : \frac{b}{c} : \frac{c}{a} = 3x/4x : 4x/6x : 6x/3x = 3/4 : 2/3 : 2 = 9 : 8 : 24$.

Question 59 :

A loan is to be returned in two equal yearly instalments. If the rate of interest is 10% p.a. compounded annually, and each instalment is Rs 5,808, then the total interest charged in this scheme is:

Difficulty : Moderate**Average Time : 66 Seconds****Options :**

1. Rs 1,563
2. Rs 1,536
3. Rs 1,632
4. RS 1,602

Solution :

The correct answer is **option 2** i.e. **Rs 1,536**

We can use a direct formula as,

$$P = I/(1 + r/100) + I/(1 + r/100)^2$$

$$P = 5808/(1 + 10/100) + 5808/(1 + 10/100)^2$$

$$P = 5808/1.1 + 5808/1.21$$

$$P = 5280 + 4800 = 10080.$$

Total amount paid in 2 installments = $5808 + 5808 = 11616$.



Interest earned = 11616 - 10080 = 1536.

Question 60 :

The value of $(3\frac{5}{4} \div 4\frac{1}{2})$ of $(5\frac{3}{8} + \frac{1}{8} \div \frac{1}{2})$ of $(\frac{1}{4}(\frac{1}{2} \div \frac{1}{8}))$ is:

Difficulty : Moderate

Average Time : 45 Seconds

Options :

1. $\frac{13}{15}$
2. $\frac{7}{8}$
3. $\frac{3}{4}$
4. $\frac{53}{60}$

Solution :

The correct answer is **option 4** i.e. $\frac{53}{60}$

The given equation can be written as,

$$16/5 \div 9/2 \text{ of } 16/3 + 1/8 \div 1/2 \text{ of } 1/4 - 1/4(1/2 \div 1/8 \times 1/4)$$

$$16/5 \div 9/2 \text{ of } 16/3 + 1/8 \div 1/2 \text{ of } 1/4 - 1/4$$

$$16/5 \div 24 + 1/8 \div 1/8 - 1/4$$

$$2/15 + 1 - 1/4$$

$$2/15 + 3/4$$

$$53/60.$$

Question 61 :

A sold an item to B at 20% gain, B sold it to C at 8% gain. C sold it to D at 25% loss. If the difference between the profits of A and B is Rs 260, then D bought it for:

Difficulty : Moderate

Average Time : 57 Seconds

Options :

1. Rs 2,268
2. Rs 2,430
3. Rs 2,200



Rs 2,480

Solution :

The correct answer is **option 2** i.e. **Rs 2,430**.

Let the CP of an item for A = $100x$.

A sold the item at 20% gain to B,

SP of an item for A = CP of an item for B = $100x \times 120\% = 120x$.

B sold the item to C at 8% gain.

CP of an item for C = $120x \times 108\% = 129.6x$.

CP an item for D = $129.6 \times 75\% = 97.2x$.

Difference of profit of A and B = 260

$20x - 9.6x = 260$

$10.4x = 260$

$x = 25$.

CP of an item for D = $97.2x = 97.2 \times 25 = 2430$.

Question 62 :

Renu saves 20% of her income. If her expenditure increases by 20% and income increases by 29%, then her savings increase by:

Difficulty : Moderate

Average Time : 58 Seconds

Options :

1. 55%
2. 65%
3. 54%
4. 60%

Solution :

The correct answer is **option 2** i.e. **65%**

Let the income be $100x$.

Saving of Renu = 20% of 100x = 20x.

Expenditure = 100x - 20x = 80x.

New income = 100x × 129% = 129x

New expenditure = 80x × 120% = 96x.

Savings = 129x - 96x = 33x.

% increase = $(33x - 20x)/20x \times 100 = 65\%$.

Question 63 :

The compound interest on a sum of Rs 20,000 at 15% p.a. for $2\frac{2}{3}$ years, interest compounded yearly, is:

Difficulty : Moderate

Average Time : 45 Seconds

Options :

1. Rs 9,098
2. Rs 8,896
3. Rs 9,000
4. Rs 9,095

Solution :

The correct answer is **option 4** i.e. **Rs 9,095**.

$$A = P(1 + r/100)^n$$

$$A = 20000 (1 + 15/100)^2 \times [1 + (15 \times 2/3)/100]$$

$$A = 29095.$$

$$CI = 29095 - 20000 = 9095.$$

Question 64 :

From a solid cylindrical wooden block of height 18 cm and radius 7.5 cm, a conical cavity of the same height and same radius is taken out. What is the total surface area (in cm²) of the remaining solid?

Difficulty : Moderate

Average Time : 44 Seconds

Options :



270

2. 416.25

3. 326.25

4. 472.5

Solution :

The correct answer is **option 4** i.e. **472.5** .

The slant height of the cone = $\sqrt{18^2 + 7.5^2} = 19.5$ \)

CSA of Cylinder = $2rh = 2 \times 7.5 \times 18 = 270$

CSA of cone = $rl = 7.5 \times 19.5 = 146.25$.

Area of the base = $r^2 = 56.25$.

TSA of the remaining solid = $270 + 146.25 + 56.25 = 472.5$.

Question 65 :

The ratio of the radii of two cones is 5 : 6 and their volumes are in the ratio 8 : 9. The ratio of their heights is:

Difficulty : Moderate**Average Time : 63 Seconds****Options :**

1. 32 : 25

2. 25 : 32

3. 27 : 20

4. 20 : 27

Solution :

The correct answer is **option 1** i.e. **32 : 25**

The ratio of the volume of two cones = 8 : 9.

$$\left(\frac{\frac{1}{3} \pi r_1^2 h_1}{\frac{1}{3} \pi r_2^2 h_2}\right) = 8 : 9$$

$$= (5 \times 5 \times h_1) / (6 \times 6 \times h_2) = 8 : 9$$

$$= h_1 : h_2 = 32 : 25.$$

Question 66 :



let x be the least number which when subtracts from 10424 gives a perfect square number. What is the least number by which x should be multiplied to get a perfect square?

Difficulty : Moderate

Average Time : 48 Seconds

Options :

1. 3

2. 2

3. 6

4. 5

Solution :

The correct answer is **option 4** i.e. **5**

Nearest square to 10424 is 10404

$$x = 10424 - 10404 = 20.$$

Prime factor of 20 = $2 \times 2 \times 5$

To make pairs one is missing.

To make 20 a perfect one needs to multiply the number by 5.

Question 67 :

A certain sum is divided between A, B, C and D such that the ratio of the shares of A and B is 1 : 3, that of B and C is 2 : 5, and that of C and D is 2 : 3. If the difference between the shares of A and C is Rs 3,510, then the share of D is:

Difficulty : Moderate

Average Time : 52 Seconds

Options :

1. Rs 4,320

2. Rs 3,240

3. Rs 6,075

4. Rs 4,050

Solution :

The correct answer is **option 3** i.e. **Rs 6,075**



$$A : B = 1 : 3$$

$$B : C = 2 : 5$$

$$C : D = 2 : 3.$$

On combining all the ratios we get,

$$A : B : C : D = 4 : 12 : 30 : 45.$$

The difference between the shares of A and C is Rs 3,510.

$$30x - 4x = 3510$$

$$x = 135.$$

$$\text{Share of D} = 45x = 45 \times 135 = 6075.$$

Question 68 :

If $\left(\frac{1}{x} + \frac{1}{y + \frac{2}{z + \frac{1}{4}}}\right) = \frac{29}{79}$, where x, y and z are natural numbers, then the value of $(2x + 3y - z)$ is:

Difficulty : Moderate

Average Time : 50 Seconds

Options :

1. 0

2. 4

3. 1

4. 2

Solution :

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

On Solving the RHS first we get,

$$\frac{29}{79} \left(\hat{=} \frac{1}{\frac{79}{29}} \right)$$

$$\frac{29}{79} = \left(\frac{1}{2 + \frac{21}{29}} \right)$$

$$\frac{29}{79} = \left(\frac{1}{2 + \frac{1}{\frac{21}{29}}} \right)$$

$$\frac{29}{79} = \left(\frac{1}{2 + \frac{1}{1 + \frac{8}{21}}} \right)$$

$$29/79 = \left(\frac{1}{2} + \frac{1}{1} + \frac{2}{\frac{21}{4}}\right)$$

$$29/79 = \left(\frac{1}{2} + \frac{1}{1} + \frac{2}{5 + \frac{1}{4}}\right)$$

On comparing with the LHS we get,

$$x = 2, y = 1 \text{ and } z = 5.$$

$$(2x + 3y - z) = 2 \times 2 + 3 \times 1 - 5 = 2.$$

Question 69 :

In a circle, O is the centre of the circle, Chords AB and CD intersect at P. If $\angle AOD = 32^\circ$ and $\angle COB = 26^\circ$, then the measure of $\angle APD$ lies between:

Difficulty : Moderate

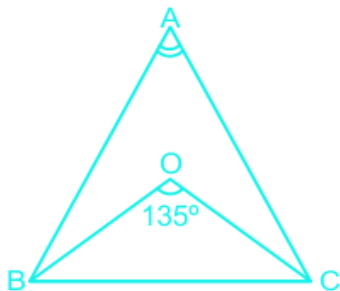
Average Time : 62 Seconds

Options :

1. 18° and 22°
2. 26° and 30°
3. 30° and 34°
4. 22° and 26°

Solution :

The correct answer is **option 2** i.e. 26° and 30°



$$\angle ABD = \frac{1}{2} \times \angle AOD = \frac{1}{2} \times 32 = 16^\circ$$

$$\angle COB = \frac{1}{2} \times \angle CDB = \frac{1}{2} \times 26 = 13^\circ.$$

$$\angle DPB = 180 - \angle PDB - \angle PBD$$

$$\angle DPB = 180 - 13 - 16 = 151^\circ.$$



$$APD + BPD = 180$$

$$APD = 180 - 151 = 29^\circ.$$

Question 70 :

If a regular polygon has 16 sides, then what is the measure (in degrees) of its each interior angle?

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

1. 154
2. $157\frac{1}{2}$
3. 155
4. $159\frac{1}{2}$

Solution :

The correct answer is **option 2** i.e. $157\frac{1}{2}$

Each exterior angle = $360/n$

Where n is the number of sides.

Each exterior angle = $360/16 = 22.5^\circ$.

Interior angle corresponding to the exterior angle = $180 - 22.5 = 157.5^\circ$.

Question 71 :

$\frac{\sec A(\sec A + \tan A)(1 - \sin A)}{(\operatorname{cosec}^2 A - 1)\sin^2 A}$ is equal to:

Difficulty : Moderate**Average Time : 40 Seconds****Options :**

1. $\cot A$
2. $\cos A$
3. $\sec^2 A$
4. $\cos^2 A$

Solution :

The correct answer is **option 3** i.e. $\sec^2 A$.

On solving the numerator part first,

$$= \sec A (\sec A + \tan A) (1 - \sin A)$$

$$= \frac{1}{\cos A} \left(\frac{1}{\cos A} + \frac{\sin A}{\cos A} \right) (1 - \sin A)$$

$$= \frac{(1 + \sin A)}{\cos^2 A} \times (1 - \sin A)$$

$$= 1.$$

Now solve the denominator part,

$$= (\operatorname{cosec}^2 A - 1) \sin^2 A$$

$$= (1 - \sin^2 A)$$

$$= \cos^2 A$$

On combining,

$$= \frac{1}{\cos^2 A}$$

$$= \sec^2 A$$

Comprehension :

Study the given graph and answer the question that follows.

Question 72 :

The total production of computers in 2013, 2015 and 2018 is $x\%$ of the total exports of computers by the company during the six years. The value of x is :

Difficulty : Moderate

Average Time : 64 Seconds

Options :

1. $46\left(\frac{1}{3}\right)$

2. $52\left(\frac{1}{3}\right)$

3. $53\left(\frac{1}{3}\right)$

4. $49\left(\frac{2}{3}\right)$

Solution :

The correct answer is **option 3** i.e. $53\left(\frac{1}{3}\right)$

The total production of computers in 2013, 2015 and 2018 = 800

The total exports of computers by the company during the six years = 1500

$$x = 800/1500 \times 100 = 53\frac{1}{3}\%$$

Question 73 :

Let D and E be two points on the side BC of $\triangle ABC$ such that $AD = AE$ and $\angle BAD = \angle EAC$. If $AB = (3x + 1)$ cm, $BD = 9$ cm, $AC = 34$ cm and $EC = (y + 1)$ cm, then the value of $(x + y)$ is:

Difficulty : Moderate

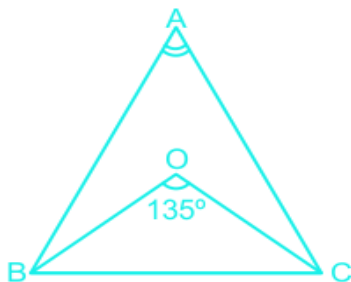
Average Time : 53 Seconds

Options :

1. 19
2. 16
3. 17
4. 20

Solution :

The correct answer is **option 1** i.e. **19**.



In $\triangle ABD$ and $\triangle AEC$,

$\angle BAD = \angle EAC$, $AD = AE$ and $\angle AED = \angle ADE$.

So one can say that,

$\triangle ABD$ and $\triangle AEC$ are similar.

$$BD/EC = AB/AC = AD/AE = 1/1$$

$$9/(y + 1) = (3x + 1)/34 = 1/1$$

On comparing we get,

$$y = 8 \text{ and } x = 11$$



$$x + y = 11 + 8 = 19.$$

Question 74 :

The value of $0.5\bar{7} - 0.4\bar{3} + 0.3\bar{5}$ is:

Difficulty : Moderate

Average Time : 51 Seconds

Options :

1. $0.49\bar{8}$
2. $0.49\bar{4}$
3. $0.4\bar{9}\bar{8}$
4. $0.4\bar{9}\bar{4}$

Solution :

The correct answer is **option 1** i.e. $0.49\bar{8}$

$$0.5\bar{7} = 57/99.$$

$$0.4\bar{3} = (432 - 4)/990 = 428/990.$$

$$0.3\bar{5} = (35 - 3)/90 = 32/90.$$

$$0.5\bar{7} - 0.4\bar{3} + 0.3\bar{5} = 57/99 - 428/990 + 32/90$$

$$= (570 - 428 + 352)/990$$

$$= (494)/990 = 0.49\bar{8}.$$

Question 75 :

In $\triangle PQR$, $\angle P = 90^\circ$, S and T are the midpoints of sides PR and PQ, respectively. What is the value of $\frac{RQ^2}{QS^2 + RT^2}$?

Difficulty : Moderate

Average Time : 41 Seconds

Options :

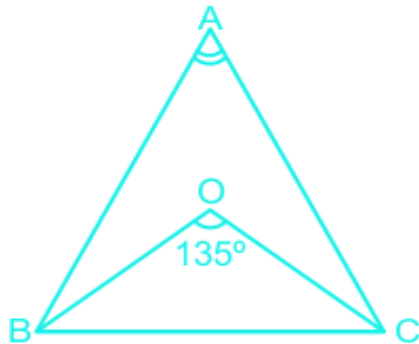
1. $\frac{3}{4}$
2. $\frac{4}{5}$

$\left(\frac{1}{2}\right)$

4. $\left(\frac{2}{3}\right)$

Solution :

The correct answer is **option 2** i.e. $\left(\frac{4}{5}\right)$.



In $\triangle PQR$, by using Pythagoras theorem we get,

$$RQ^2 = 2^2 + 2^2 = 8.$$

In $\triangle PRT$, by using Pythagoras theorem we get,

$$RT^2 = 2^2 + 1^2 = 5.$$

In $\triangle PSQ$, by using Pythagoras theorem we get,

$$SQ^2 = 1^2 + 2^2 = 5.$$

$$RQ^2 / (SQ^2 + RT^2) = 8 / 10 = 4/5.$$

Question 76 :

In a circle with centre O, AB is the diameter. P and Q are two points on the circle on the same side of the diameter AB. AQ and BP intersect at C. If $\angle POQ = 54^\circ$, then the measure of $\angle PCA$ is:

Difficulty : Moderate

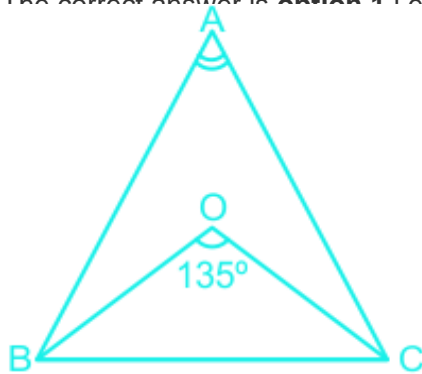
Average Time : 70 Seconds

Options :

1. 63°
2. 56°
3. 54°
4. 72°

Solution :

The correct answer is **option 1** i.e. **63°**



$APB = 90^\circ.$

$PAQ = \frac{1}{2} \times 54^\circ = 27^\circ$ (Angle subtended by the arc at circumference will be half of the angle subtended at the centre).

Now in $\triangle APC$,

$90 + 27 + PCA = 180^\circ.$

$PCA = 63^\circ.$

Question 77 :

A, B and C invested capital in the ratio 5 : 7 : 4, the timing of their investments being in the ratio x : y : z. If their profits are distributed in the ratio 45 : 42 : 28, then x : y : z =?

Difficulty : Moderate

Average Time : 56 Seconds

Options :

1. 9 : 6 : 7
2. 7 : 9 : 4
3. 9 : 4 : 7
4. 6 : 7 : 9

Solution :

The correct answer is **option 1** i.e. **9 : 6 : 7**.

We know that

Profit share = Investment \times Time period.



$$45 : 42 : 28 = 5 \times x : 7 \times y : 4 \times z$$

On comparing we get,

$$x = 9, y = 6 \text{ and } z = 7$$

$$x : y : z = 9 : 6 : 7.$$

Question 78 :

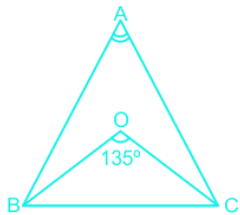
In $\triangle ABC$, D and E are points on the sides AB and AC, respectively, such that $DE \parallel BC$ and $DE : BC = 6 : 7$. (Area of $\triangle ADE$) : (Area of trapezium BCED) = ?

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

1. 49 : 13
2. 13 : 36
3. 13 : 49
4. 36 : 13

Solution :

The correct answer is **option 4** i.e. **36 : 13**



Here $DE \parallel BC$ so one can say that $\triangle ABC$ and $\triangle ADE$ are similar.

$$\text{Area of } \triangle ADE : \text{Area of } \triangle ABC = (6 : 7)^2$$

$$\text{Area of } \triangle ADE : \text{Area of } \triangle ABC = 36 : 49$$

$$\text{Area of } \triangle ADE : (\text{Area of trapezium BCED}) = 36 : 49 - 36$$

$$\text{Area of } \triangle ADE : (\text{Area of trapezium BCED}) = 36 : 13.$$

Question 79 :

The ratio of the monthly incomes of X and Y is 5 : 4 and that of their monthly expenditures is 9 : 7. If the income of Y is equal to the expenditure of X, then what is the ratio of the savings of X and Y ?

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

1. 9 : 8
2. 6 : 7
3. 8 : 9
4. 7 : 6

Solution :

The correct answer is **option 1** i.e. **9 : 8**

Let the income of X and Y is 5a and 4a.

The expenditure of X and Y be 9b and 7b.

If the income of Y is equal to the expenditure of X then,

$$4a = 9b$$

$$a/b = 9/4.$$

Let a = 9 units and b = 4 units then,

	Income	Expenditure	Savings
X	45	36	9
Y	36	28	8

The ratio of the savings of X and Y = 9 : 8.

Question 80 :

Let x be the greater number which when divides 955, 1027, 1075 the remainder in each case is the same. Which of the following is NOT a factor of x?



Difficulty : Moderate

Average Time : 66 Seconds

Options :

1. 4
2. 16
3. 8
4. 6

Solution :

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

Here we don't know about the remainder, but all three are equal so it may be 0. To ease problem-solving one must consider the rem as 0.

One can say that, $x = \text{HCF of } (955 + 1027 + 1075)$.

$\text{HCF of } (955 + 1027 + 1075) = \text{HCF of } (1075 - 1027, 1075 - 955, 1027 - 955)$

$\text{HCF of } (955 + 1027 + 1075) = \text{HCF of } (48, 120, 72)$

$\text{HCF of } (955 + 1027 + 1075) = 24$.

Factor of 24 = 1, 2, 3, 4, 6, 8, 12, 24.

16 is not the factor of 24.

Question 81 :

If $2x^2 - 7x + 5 = 0$, then what is the value of $x^2 + \frac{25}{4x^2}$?

Difficulty : Moderate

Average Time : 47 Seconds

Options :

1. $5\left(\frac{1}{2}\right)$
2. $7\left(\frac{1}{4}\right)$
3. $9\left(\frac{1}{2}\right)$
4. $9\left(\frac{3}{4}\right)$

Solution :

The correct answer is **option 2** i.e. $7\left(\frac{1}{4}\right)$.

$$2x^2 - 7x + 5 = 0$$

On dividing both sides by $2x$ we get,

$$x - \frac{7}{2} + \frac{5}{2x} = 0$$

$$x + \frac{5}{2x} = \frac{7}{2} \dots \dots \dots (1)$$

On squaring both sides we get,

$$x^2 + \frac{25}{4x^2} + 2 \times x \times \frac{5}{2x} = \frac{49}{4}$$

$$x^2 + \frac{25}{4x^2} = \frac{49}{4} - 5 = \frac{29}{4}$$

$$x^2 + \frac{25}{4x^2} = 7\left(\frac{1}{4}\right)$$

Question 82 :

Raju ate $\left(\frac{3}{8}\right)$ part of a pizza and Adam ate $\left(\frac{3}{10}\right)$ part of the remaining pizza. Then Renu ate $\left(\frac{4}{7}\right)$ part of the pizza that was left. What fraction of the pizza is still left?

Difficulty : Moderate

Average Time : 63 Seconds

Options :

1. $\left(\frac{5}{12}\right)$
2. $\left(\frac{1}{4}\right)$
3. $\left(\frac{1}{8}\right)$
4. $\left(\frac{3}{16}\right)$

Solution :

The correct answer is **option 4** i.e. $\left(\frac{3}{16}\right)$.

Let the quantity of the pizza be x units.

Raju ate $\left(\frac{3}{8}\right)$ part of a pizza, which implies that $\frac{5}{8}$ part of the pizza is still remaining.

Adam ate $\left(\frac{3}{10}\right)$ part of the remaining pizza, which implies that $\frac{7}{10}$ part of the pizza is still remaining.

Renu ate $\left(\frac{4}{7}\right)$ part of the pizza, which means $\frac{3}{7}$ part of the pizza is still remaining.

$$\text{Remaining part} = x \times \frac{5}{8} \times \frac{7}{10} \times \frac{3}{7} = x \times \frac{3}{16}$$

$$\text{Required fraction} = \frac{(3x/16)}{x} = \frac{3}{16}$$

Question 83 :

A secant PAB is drawn from an external point P to the circle with centre O, intersecting it at A and B. If OP = 17 cm, PA = 12 cm, and PB = 22.5 cm, then the radius of the circle is:

Difficulty : Moderate

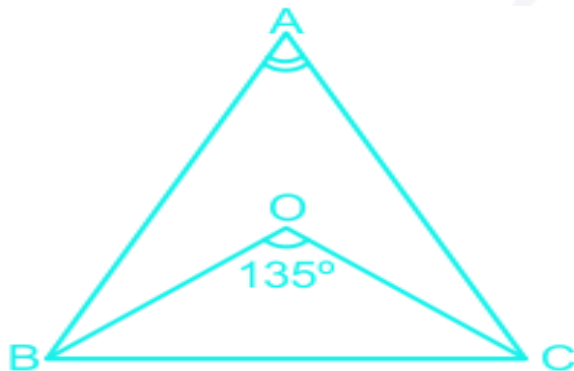
Average Time : 70 Seconds

Options :

1. 23 cm
2. 19 cm
3. 17 cm
4. 32 cm

Solution :

The correct answer is **option 2** i.e. **19 cm**



By using the tangent secant theorem,

$$PC^2 = PA \times PB$$

$$PC^2 = 12 \times 22.2 = 270$$

In $\triangle POC$,

$$OP^2 = OC^2 + PC^2$$

$$289 - 270 = OC^2$$

$$OC = \sqrt{19} \text{ cm.}$$

Question 84 :



Pipes A and B can fill a tank in 12 minutes and 15 minutes, respectively. The tank when full can be emptied by pipe C in x minutes. When all the three pipes are opened simultaneously, the tank is full in 10 minutes. The value of x is:

Difficulty : Moderate

Average Time : 63 Seconds

Options :

1. 18

2. 15

3. 20

4. 24

Solution :

The correct answer is **option 3** i.e. **20**.

Let the total work = LCM of 12 and 15.

Total work = 60 units.

Efficiency of A = $60/12 = 5$ units/minutes.

Efficiency of B = $60/15 = 4$ units/minutes.

If A, B and C work together then can fill the tank in 10 minutes.

Combined efficiency of them = $60/10 = 6$ units/minutes

$5 + 4 + C = 6$

$C = -3$.

Time taken by C to empty the tank = $60/3 = 20$ minutes.

$x = 20$ minutes.

Question 85 :

In a quadrilateral ABCD, E is a point in the interior of the quadrilateral such that DE and CE are the bisector of D and C, respectively. If $B = 82^\circ$ and $DEC = 80^\circ$, then $A = ?$

Difficulty : Moderate

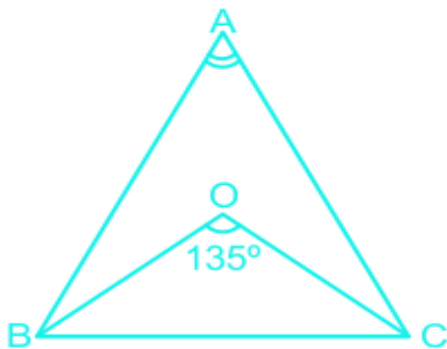
Average Time : 58 Seconds

Options :

- 75°
- 2. 81°
- 3. 84°
- 4. 78°

Solution :

The correct answer is **option 4** i.e. **78°**



Let $\angle EDC$ and $\angle ECD$ be 'a' and 'b'.

In $\triangle EDC$,

$$a + b + 80 = 180$$

$$a + b = 100.$$

$$2a + 2b = 200.$$

We know that the sum of all the angles of a quadrilateral will be equal to 360° .

$$A + B + C + D = 360.$$

$$A = 360 - 82 - 200 = 78^\circ.$$

Question 86 :

A drink of chocolate and milk contains 8% pure chocolate by volume. If 10 liters of pure milk are added to 50 litres of this drink, the percentage of chocolate in the new drink is:

Difficulty : Moderate

Average Time : 62 Seconds

Options :

- 1. $6\frac{2}{3}\%$



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

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

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

Solution :

The correct answer is **option 1** i.e. $\frac{2}{3}$.

In 50 litres of the chocolate solution,

Chocolate = 8% of 50 = 4L.

Milk = 50 - 4 = 46L.

Now 10 litres of pure milk is added.

Now the concentration of milk = 46 + 10 = 56L

Total concentration of solution = 56 + 4 = 60L

% of chocolate = $\frac{4}{60} \times 100 = \frac{2}{3}\%$.

Question 87 :

In $\triangle ABC$, M and N are the points on side BC such that $AM \perp BC$, AN is the bisector of A, and M lies between B and N. If $B = 68^\circ$, and $C = 26^\circ$, then the measure of $\angle MAN$ is:

Difficulty : Moderate

Average Time : 60 Seconds

Options :

1. 21°

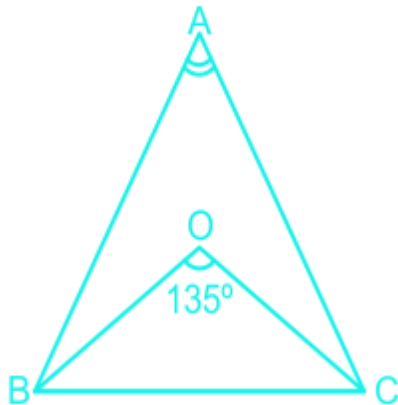
2. 28°

3. 24°

4. 22°

Solution :

The correct answer is **option 1** i.e. 21° .



In $\triangle ABC$,

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

$$A = 180 - 68 - 26 = 86^\circ$$

$$\angle BAN = \angle NAC = \frac{1}{2} \text{ of } 86 = 43^\circ$$

In $\triangle ABM$,

$$\angle ABM + \angle BAM + \angle AMB = 180$$

$$68^\circ + \angle BAM + 90 = 180^\circ.$$

$$\angle BAM = 22.$$

$$\angle MAN = 43 - 22 = 21^\circ.$$

Question 88 :

A and B start moving from places X and Y and Y to X, respectively, at the same time on the same day. After crossing each other, A and B takes $5\frac{4}{9}$ hours and 9 hours, respectively, to reach their respective destinations. If the speed of A is 33 km/h, then the speed (in km/h) of B is:

Difficulty : Moderate

Average Time : 67 Seconds

Options :

1. 22
2. 2
3. $25\frac{2}{3}$

$$24\left(\frac{1}{3}\right)$$

5. 20

Solution :

The correct answer is **option 3** i.e. $25\left(\frac{2}{3}\right)$.

We know that,

$$\left(\frac{S_A}{S_B}\right) = \sqrt{\frac{t_B}{t_A}}$$

$$\left(\frac{33}{S_B}\right) = \sqrt{\frac{9}{\frac{49}{9}}}$$

$$\left(\frac{33}{S_B}\right) = \frac{9}{7}$$

$$S_B = 25\left(\frac{2}{3}\right)$$

Question 89 :

In $\triangle ABC$, D and E are the mid-points of sides BC and AC, respectively. AD and BE intersect at G at right angle. If AD = 18 cm and BE = 12 cm, then the length of DC (in cm) is:

Difficulty : Moderate

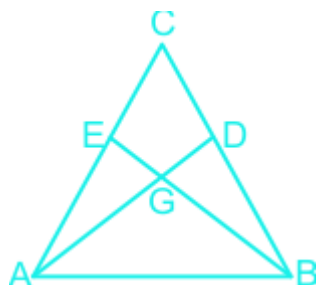
Average Time : 59 Seconds

Options :

1. 10
2. 6
3. 9
4. 8

Solution :

The correct answer is **option 1** i.e. **10**



As one can see that, AD and BE act as a median so G must be a centroid.



$GD = 1/3$ of $AD = 1/3$ of $18 = 6\text{cm}$.

$BG = 2/3$ of $12 = 8\text{cm}$.

Now in $\triangle BGD$, by using Pythagoras' theorem

$$BG^2 + DG^2 = BD^2$$

$$64 + 36 = BD^2$$

$$BD = 10.$$

$$BD = DC = 10 \text{ cm}.$$

Question 90 :

If A is 40% less than B and C is 40% of the sum of A and B, then by what percentage is B greater than C?

Difficulty : Moderate

Average Time : 56 Seconds

Options :

1. 60
2. $56\frac{1}{4}\%$
3. $40\frac{1}{8}\%$
4. 36

Solution :

The correct answer is **option 2** i.e. $56\frac{1}{4}\%$.

A is 40% less than B.

Let B be $100x$ then $A = 60x$.

$C = 40\%$ of $(A + B)$

$$C = 40/100 \times (160x)$$

$$C = 64x.$$

$$\text{Required \%} = (100x - 64x)/64x \times 100 = 56.25\%.$$

Question 91 :

When 5 children from class A join class B, the number of children in both classes is the same. If 25 children from B, join A, then the number of children in A becomes double the number of children in B. The ratio of the number of children in A to B is:

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

1. 19 : 18
2. 9 : 8
3. 18 : 17
4. 19 : 17

Solution :

The correct answer is **option 4** i.e. **19 : 17**.

Let the number of children in classes A and B be 'a' and 'b'.

According to the question,

$$a - 5 = b + 5$$

$$a - b = 10 \dots\dots\dots(1)$$

$$(b - 25) \times 2 = a + 25$$

$$2b - a = 75 \dots\dots\dots(2)$$

On adding eq 1 and 2 we get,

$$b = 85.$$

If $b = 85$ then $a = 95$.

Required ratio = $95 : 85 = 19 : 17$.

Question 92 :

A T.V. is sold at 8% gain. Had it been sold for Rs 714 more, the gain would have been 15%. To gain 18% the selling price of the T.V. should be:

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

1. Rs 12,036
2. Rs 12,138
3. Rs 11,934



Rs 12,240

Solution :

The correct answer is **option 1** i.e. **Rs 12,036**.

Let the CP of TV be $100x$

SP of the TV at 8% gain = $108x$.

SP of the TV at 15% gain = $115x$

Difference = $115x - 108x = 714$

$7x = 714$

$x = 102$.

SP of the TV to gain 18% = $118x$

$118 \times 102 = 12036$.

Question 93 :

If $a + b + c = 7$ and $a^3 + b^3 + c^3 - 3abc = 175$, then what is the value of $(ab + bc + ca)$?

Difficulty : Moderate

Average Time : 47 Seconds

Options :

1. 8

2. 9

3. 7

4. 6

Solution :

The correct answer is **option 1** i.e. **8**.

$a + b + c = 7$.

On squaring both sides we get,

$$a^2 + b^2 + c^2 + 2(ab + bc + ca) = 49.$$

Now,

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

$$175 = 7[a^2 + b^2 + c^2 + 2(ab + bc + ca) - 3(ab + bc + ca)]$$

$$175 = 7 \times [49 - 3(ab + bc + ca)]$$

$$25 = 49 - 3(ab + bc + ca)$$

$$3(ab + bc + ca) = 24$$

$$ab + bc + ca = 8.$$

Question 94 :

If $x^2 + 4y^2 = 17$ and $xy = 2$, where $x > 0$, $y > 0$, then what is the value of $x^3 + 8y^3$?

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

1. 95

2. 85

3. 65

4. 76

Solution :

The correct answer is **option 3** i.e. **65**

$$x^2 + 4y^2 = 17.$$

On adding $4xy$ on both sides we get,

$$x^2 + 4y^2 + 4xy = 17 + 4xy$$

$$(x + 2y)^2 = 17 + 8 = 25$$

$$x + 2y = 5 \dots \dots \dots (1)$$

On cubing both sides we get,

$$x^3 + 8y^3 + 3 \times x \times 2y(x + 2y) = 125$$

$$x^3 + 8y^3 = 125 - 60 = 65.$$

Question 95 :

Amrita travels from her house at $3\frac{1}{2}$ km/h and reaches her school 6 minutes late. The next day she travels at $4\frac{1}{2}$ km/h and reaches her school 10 minutes early. What is the distance between her house and the school?

Difficulty : Moderate**Average Time : 56 Seconds****Options :**

1. 5.6 km
2. 4.8 km
3. 5.4 km
4. 4.2 km
5. 3.5 km

Solution :

The correct answer is **option 4** i.e. **4.2 km**

Let the usual time to reach at school in t minutes.

Distance = time \times speed.

In the first case, Amrita travels from her house at $3\frac{1}{2}$ km/h and reaches her school 6 minutes late

$$\text{Distance} = (t + 6) \times 7/2 \dots\dots\dots(1)$$

In the second case, she travels at $4\frac{1}{2}$ km/h and reaches her school 10 minutes early.

$$\text{Distance} = (t - 10) \times 9/2 \dots\dots\dots(2)$$

On combining 1 and 2 we get,

$$7t/2 + 21 = 9t/2 - 45$$

$$t = 66 \text{ minutes.}$$

$$\text{Distance} = (t + 6) \times 7/2.$$

$$= 72/60 \times 7/2 = 4.2 \text{ km.}$$

Question 96 :

In $\triangle ABC$, O is the incentre and $\angle BOC = 135^\circ$. The measure of $\angle BAC$ is:

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

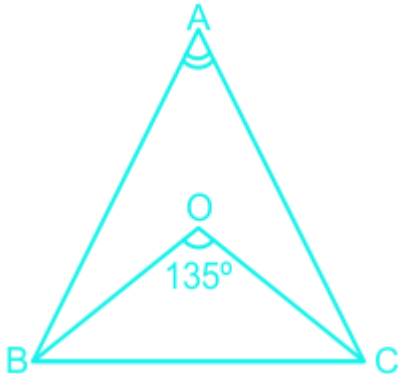
1. 90°
2. 55°

80°

4. 45°

Solution :

The correct answer is **option 1** i.e. **90°**



By using the angle bisector theorem we get,

$$\angle BOC = 90 + \frac{1}{2} \text{ of } \angle BAC.$$

$$135 = 90 + \frac{\angle BAC}{2}$$

$$\angle BAC = 90^\circ.$$

Comprehension :

Study the given graph and answer the questions that follows.

Question 97 :

In which year was the production of computers of the company 16% more than the average exports of computers in the six years (2013 to 2018)?

Difficulty : Moderate

Average Time : 50 Seconds

Options :

1. 2015
2. 2018
3. 2014
4. 2016

Solution :

The correct answer is **option 4** i.e. **2016**

Average export of computers in all six years = $(140 + 240 + 200 + 350 + 300 + 270)/6 = 250$.

16 % more than 250 = $250 \times 116\% = 290$.

One can see that, in 2016 the production of computers is 290.

Question 98 :

The graphs of the linear equations $3x - 2y = 8$ and $4x + 3y = 5$ intersect at the point P(,). What is the value of (2 -)

Difficulty : Moderate

Average Time : 41 Seconds

Options :

- 1. 3
- 2. 4
- 3. 6
- 4. 5

Solution :

The correct answer is **option 4** i.e. **5**

$$3x - 2y = 8 \dots\dots\dots(1)$$

$$4x + 3y = 5 \dots\dots\dots(2)$$

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

$$x = 2 \text{ and } y = -1.$$

The intersection point of both the lines are (2, 1),

$$(2 -) = 2 \times 2 - (-1) = 5.$$

Question 99 :

$(1 + \tan + \sec)(1 + \cot - \operatorname{cosec})/(\sec + \tan)(1 - \sin)$ is equal to:

Difficulty : Moderate

Average Time : 44 Seconds

Options :



2sec

2. 2cosec

3. cosec

4. sec

Solution :

The correct answer is **option 1** i.e. **2sec**

Let's solve the numerator part first,

Numerator :

$$(1 + \tan + \sec)(1 + \cot - \operatorname{cosec})$$

$$(1 + \sin/\cos + 1/\cos)(1 + \cos/\sin - 1/\sin)$$

$$(\cos + \sin + 1)/\cos \times (\sin + \cos - 1)\sin$$

$$[(\cos + \sin)^2 - 1^2]/\operatorname{sincos}$$

$$[\cos^2 + \sin^2 + 2\operatorname{sincos} - 1]/\operatorname{sincos}$$

2.

Denominator :

$$(\sec + \tan)(1 - \sin)$$

$$(1/\cos + \sin/\cos)(1 - \sin)$$

$$[(1 + \sin)/\cos](1 - \sin)$$

$$(1 - \sin^2)/\cos$$

$$(\cos)$$

Final answer = $2/\cos$

= 2sec

Question 100 :

The volume of a solid right cylinder of height 8 cm is 392 cm^3 . Its curved surface area (in cm^2) is:

Difficulty : Moderate

Average Time : 76 Seconds

Options :



161

2. 96

3. 210

4. 112

Solution :

The correct answer is **option 4** i.e. **112** .

Volume of the cylinder = $r^2h = 392$

$r^2 \times 8 = 392$

$r = 7$.

The curved surface area of cylinder = $2rh = 2 \times 7 \times 8 = 112$.

Ssc Cgl Tier II Previous Year Question Paper Analysis

The analysis of Ssc Cgl Tier II Previous Year Question Paper held on 2020-11-16 in the Morning exam is as follows:

1. 100 questions were moderate.
2. The safe score is 140 marks.
3. 100 questions were asked from Quantitative Aptitude and 100 questions were asked from Quantitative Aptitude
4. 1 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 - 5
2. Average - 1
3. Percentage - 4
4. Data Interpretation - 7
5. Time And Work - 3
6. Time Speed And Distance - 4

- Interest - 4
- 8. Ratios And Proportion - 7
- 9. Geometry - 12
- 10. Trigonometry - 11
- 11. Mensuration - 12
- 12. Algebra - 6
- 13. Number System - 8
- 14. Coordinate Geometry - 2
- 15. Number Series - 1
- 16. Mixtures And Alligations - 3
- 17. Partnership - 1
- 18. Profit And Loss - 7
- 19. Pipes And Cistern - 2

Ssc Cgl Tier II Previous Year Question Paper Tips and 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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Further Guidance on Ssc Cgl Tier II Previous Year Question Paper

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