

**SSC CGL  
(2020)**

**Previous Year Paper  
29 Jan 2022 Tier-II  
Maths (English)**



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## Combined Graduate Level Examination 2020 Tier II

Roll Number	
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Exam Date	29/01/2022
Exam Time	9:00 AM - 11:00 AM
Subject	Paper I Quantitative abilities

Section : Quantitative abilities

Q.1 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)?

- Ans
- 1. 15.4%
  - 2. 14.3%
  - 3. 13.9%
  - 4. 11.7%

Question ID : 65497837489

Status : Answered

Chosen Option : 2

Q.2 If  $2x^2 + 5x + 1 = 0$ , then one of the values of  $x - \frac{1}{2x}$  is:

- Ans
- 1.  $\frac{\sqrt{13}}{2}$
  - 2.  $\frac{13}{2}$
  - 3.  $\frac{\sqrt{17}}{2}$
  - 4.  $\frac{5}{2}$

Question ID : 65497837512

Status : Not Answered

Chosen Option : --

Q.3 A started a business with a capital of ₹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 ₹) of the capitals invested by B and C?

- Ans
- 1. 8,60,400
  - 2. 8,64,000
  - 3. 8,40,060
  - 4. 8,46,000

Question ID : 65497837496

Status : Not Attempted and  
Marked For Review

Chosen Option : --

Q.4 The volume of a solid hemisphere is  $19,404 \text{ cm}^3$ . Its total surface area (in  $\text{cm}^2$ ) is:

(Take  $\pi = \frac{22}{7}$ )

- Ans
- 1. 2772
  - 2. 3465
  - 3. 2079
  - 4. 4158

Question ID : 65497837537  
Status : Answered  
Chosen Option : 1

Q.5 If  $2x - y = 2$  and  $xy = \frac{3}{2}$ , then what is the value of  $x^3 - \frac{y^3}{8}$  ?

- Ans
- 1.  $\frac{5}{2}$
  - 2.  $\frac{13}{4}$
  - 3.  $\frac{9}{2}$
  - 4.  $-\frac{5}{4}$

Question ID : 65497837511  
Status : Not Attempted and Marked For Review  
Chosen Option : --

Q.6 The value of  $0.4\bar{6} + 0.7\bar{23} - 0.3\bar{9} \times 0.\bar{7}$  is:

- Ans
- 1.  $0.\bar{97}$
  - 2.  $0.\bar{77}$
  - 3.  $0.\bar{57}$
  - 4.  $0.\bar{87}$

Question ID : 65497837466  
Status : Not Attempted and Marked For Review  
Chosen Option : --

Q.7 In  $\triangle ABC$ ,  $\angle A = 66^\circ$  and  $\angle B = 50^\circ$ . If the bisectors of  $\angle B$  and  $\angle C$  meet at  $P$ , then,  $\angle BPC - \angle PCA = ?$

- Ans
- 1.  $93^\circ$
  - 2.  $81^\circ$
  - 3.  $91^\circ$
  - 4.  $83^\circ$

Question ID : 65497837520  
Status : Answered  
Chosen Option : 3

Q.8 The base of 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:

- Ans
- 1.  $10\sqrt{3}$
  - 2.  $5\sqrt{\frac{23}{3}}$
  - 3.  $5\sqrt{3}$
  - 4.  $10\sqrt{\frac{23}{3}}$

Question ID : 65497837532  
Status : Answered  
Chosen Option : 4

Q.9 If  $847 \times 385 \times 675 \times 3025 = 3^a \times 5^b \times 7^c \times 11^d$ , then the value of  $ab - cd$  is:

- Ans
- 1. 5
  - 2. 4
  - 3. 1
  - 4. 7

Question ID : 65497837464  
Status : Not Attempted and Marked For Review  
Chosen Option : --

Q.10 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 ₹60,000 by paying online through credit card. How much does he need to pay (in ₹)?

- Ans
- 1. 62,150
  - 2. 61,250
  - 3. 53,100
  - 4. 51,300

Question ID : 65497837494  
Status : Answered  
Chosen Option : 4

Q.11 If  $1 + 2 \tan^2 \theta + 2 \sin \theta \sec^2 \theta = \frac{a}{b}$ ,  $0^\circ < \theta < 90^\circ$ , then  $\frac{a+b}{a-b} = ?$

- Ans
- 1.  $\sin \theta$
  - 2.  $\operatorname{cosec} \theta$
  - 3.  $\cos \theta$
  - 4.  $\sec \theta$

Question ID : 65497837543  
Status : Not Answered  
Chosen Option : --

Q.12 If  $\frac{22\sqrt{2}}{4\sqrt{2}-\sqrt{3+\sqrt{5}}} = a + \sqrt{5} b$ , with  $a, b > 0$ , then what is the value of  $(ab) : (a + b)$ ?

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

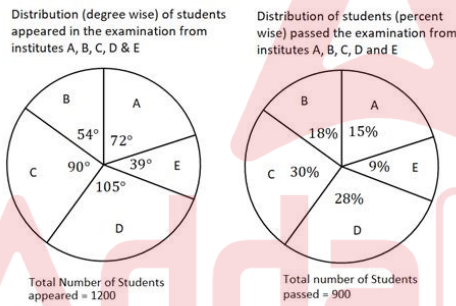
Question ID : 65497837474  
Status : Not Answered  
Chosen Option : --

Q.13 A student goes to school at a speed of  $5\frac{1}{2}$  km/h and returns at a speed of 4 km/h. If he takes  $4\frac{3}{4}$  hours for the entire journey, then the total distance covered by the student (in km) is:

- Ans
- 1. 16
  - 2. 22
  - 3. 24
  - 4. 11

Question ID : 65497837501  
Status : Answered  
Chosen Option : 2

Q.14 Study the given pie charts and answer the question that follows.



The number of students who passed the examination from institute D exceeds the number of students who appeared from institute A is  $x$ . The value of  $x$  lies between:

- Ans
- 1. 14 and 17
  - 2. 8 and 11
  - 3. 11 and 14
  - 4. 5 and 8

Question ID : 65497837558  
Status : Answered  
Chosen Option : 3



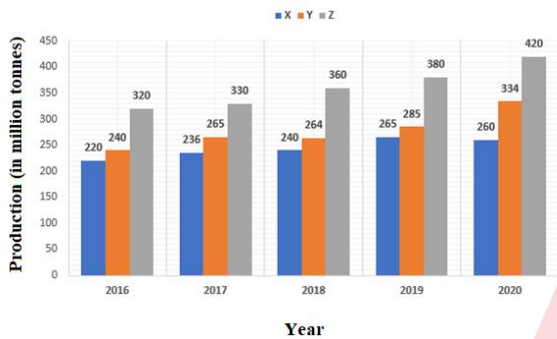
**Q.15** A sum of money becomes ₹11,880 after 4 years and ₹17,820 after 6 years on compound interest, if the interest is compounded annually. What is the half of the sum (in ₹)?

- Ans
- 1. 2,410
  - 2. 2,750
  - 3. 2,530
  - 4. 2,640

Question ID : 65497837486  
 Status : Not Answered  
 Chosen Option : --

**Q.16** Study the given graph and answer the question that follows.

**Production of fertilisers by countries X, Y and Z from 2016 to 2020**  
(in million tonnes)

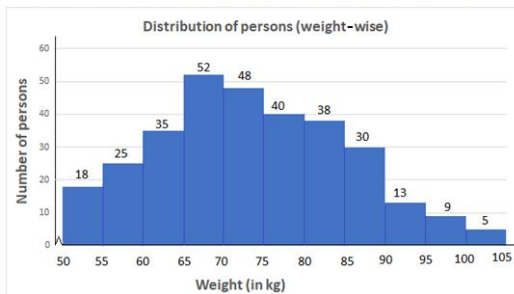


The total production of fertilisers by country Y in 2017 and 2019 and by country X in 2016 is what percentage of the total production of fertilisers by country Z in 2016, 2018 and 2020?

- Ans
- 1. 77%
  - 2. 70%
  - 3. 60%
  - 4. 69%

Question ID : 65497837557  
 Status : Answered  
 Chosen Option : 2

**Q.17** Study the given histogram and answer the question that follows.



The number of persons weighing 55 kg or more but less than 75 kg is what percentage more than the number of persons weighing 80 kg or more but less than 100 kg (correct to one decimal place)?

- Ans
- 1. 88.2%
  - 2. 77.8%
  - 3. 68.4%
  - 4. 66.7%

Question ID : 65497837554  
 Status : Answered  
 Chosen Option : 2

**Q.18** The slant height and radius of a right circular cone are in the ratio 29 : 20. If its volume is  $4838.4 \pi \text{ cm}^3$ , then its radius is:

- Ans
- 1. 24 cm
  - 2. 20 cm
  - 3. 25 cm
  - 4. 28 cm

Question ID : 65497837534  
Status : Not Answered  
Chosen Option : --

**Q.19** If  $x^2 - \sqrt{7}x + 1 = 0$ , then what is the value of  $x^5 + \frac{1}{x^5}$  ?

- Ans
- 1.  $21\sqrt{7}$
  - 2.  $25\sqrt{7}$
  - 3.  $19\sqrt{7}$
  - 4.  $27\sqrt{7}$

Question ID : 65497837514  
Status : Answered  
Chosen Option : 3

**Q.20**  $ABCD$  is a cyclic quadrilateral and  $BC$  is a diameter of the circle. If  $\angle DBC = 29^\circ$ , then  $\angle BAD = ?$

- Ans
- 1.  $122^\circ$
  - 2.  $119^\circ$
  - 3.  $129^\circ$
  - 4.  $111^\circ$

Question ID : 65497837526  
Status : Answered  
Chosen Option : 2

**Q.21** The monthly expenses of a person are  $66\frac{2}{3}\%$  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 ₹1,040 in her monthly savings. What is the initial expenditure (in ₹)?

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

Question ID : 65497837478  
Status : Not Answered  
Chosen Option : --



**Q.22** Two pipes A and B can fill a cistern in  $12\frac{1}{2}$  hours 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?

- Ans**
- 1. 30
  - 2. 50
  - 3. 40
  - 4. 35

Question ID : 65497837506

Status : Answered

Chosen Option : 4

**Q.23** A sum of ₹ 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 ₹ 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 ₹) ?

- Ans**
- 1. 6000
  - 2. 6500
  - 3. 5000
  - 4. 7000

Question ID : 65497837482

Status : Answered

Chosen Option : 1

**Q.24** 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 40 km/h, then what is the value of (x - 10) : (x + 1)?

- Ans**
- 1. 20 : 31
  - 2. 31 : 20
  - 3. 10 : 11
  - 4. 11 : 10

Question ID : 65497837502

Status : Not Attempted and  
Marked For Review

Chosen Option : --

- Q.25** 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:

Ans

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

Question ID : 65497837499

Status : Answered

Chosen Option : 4

- Q.26** The curved surface area and the volume of a cylindrical object are  $88\text{ cm}^2$  and  $132\text{ cm}^3$ , respectively. The height (in cm) of the cylindrical object is:

(Take  $\pi = \frac{22}{7}$ )

Ans

- ✗ 1. 6
- ✓ 2.  $4\frac{2}{3}$
- ✗ 3.  $3\frac{2}{3}$
- ✗ 4. 4

Question ID : 65497837539

Status : Answered

Chosen Option : 2

- Q.27** In an examination, 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?

Ans

- ✗ 1. 18
- ✗ 2. 12
- ✓ 3. 10
- ✗ 4. 15

Question ID : 65497837509

Status : Answered

Chosen Option : 3

Q.28 If a 10-digit number 75462A97B6 is divisible by 72, then the value of

$\sqrt{8A - 4B}$  is:

- Ans
- 1.  $\sqrt{21}$
  - 2.  $\sqrt{27}$
  - 3.  $\sqrt{28}$
  - 4.  $\sqrt{30}$

Question ID : 65497837461

Status : Answered

Chosen Option : 3

Q.29 ABCD is a quadrilateral in which  $AB \parallel DC$ . E and F are the midpoints of the diagonals AC and BD, respectively. If  $AB = 18$  cm and  $CD = 6$  cm, then  $EF = ?$

- Ans
- 1. 8 cm
  - 2. 9 cm
  - 3. 6 cm
  - 4. 12 cm

Question ID : 65497837529

Status : Answered

Chosen Option : 3

Q.30 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  $\angle APD = 25^\circ$  and  $\angle DAP = 39^\circ$ , then the measure of  $\angle CBD$  is:

- Ans
- 1.  $29^\circ$
  - 2.  $27^\circ$
  - 3.  $26^\circ$
  - 4.  $32^\circ$

Question ID : 65497837527

Status : Answered

Chosen Option : 3

Q.31 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 ₹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:

- Ans
- 1. 22.17
  - 2. 21.28
  - 3. 20.52
  - 4. 10.98

Question ID : 65497837484

Status : Not Answered

Chosen Option : --

**Q.32** In  $\triangle ABC$ ,  $O$  is the point of intersection of the bisectors of  $\angle B$  and  $\angle A$ . If  $\angle BOC = 108^\circ$ , then  $\angle BAO = ?$

- Ans
- 1.  $27^\circ$
  - 2.  $18^\circ$
  - 3.  $40^\circ$
  - 4.  $36^\circ$

Question ID : 65497837518  
Status : Answered  
Chosen Option : 2

**Q.33** 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 ₹1,86,000, then C's share of profit (in ₹) is:

- Ans
- 1. 15,39,000
  - 2. 19,35,000
  - 3. 13,95,000
  - 4. 10,29,500

Question ID : 65497837497  
Status : Answered  
Chosen Option : 3

**Q.34** 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 equation:

- Ans
- 1.  $x + 2y - 5 = 0$
  - 2.  $3x - y - 7 = 0$
  - 3.  $x - 3y - 12 = 0$
  - 4.  $4x - y + 7 = 0$

Question ID : 65497837515  
Status : Not Attempted and Marked For Review  
Chosen Option : --

**Q.35** In 6 minutes,  $\frac{4}{13}$  of a bucket is filled. How much time will it take to fill the remaining bucket?

- Ans
- 1. 14 minutes 30 seconds
  - 2. 11 minutes 30 seconds
  - 3. 13 minutes 30 seconds
  - 4. 12 minutes 30 seconds

Question ID : 65497837500  
Status : Answered  
Chosen Option : 3

**Q.36** An article was sold for ₹716 after offering a discount of 10.5%. If a discount of 6.5% is given, then for how much (in ₹) should it be sold?

- Ans
- 1. 732
  - 2. 675
  - 3. 756
  - 4. 748

Question ID : 65497837490  
Status : Answered  
Chosen Option : 4

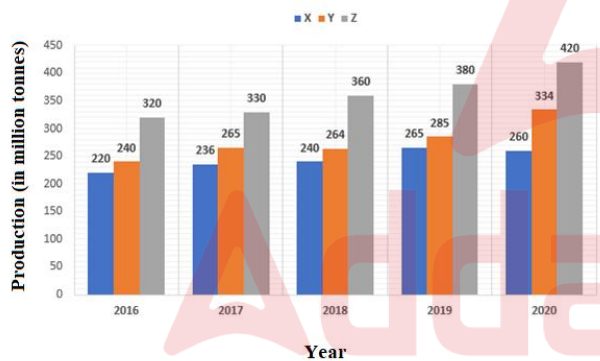
**Q.37** G is the centroid of a triangle ABC, whose sides AB = 35 cm, BC = 12 cm, and AC = 37 cm. The length of BG is (correct to one decimal place):

- Ans
- 1. 11.7 cm
  - 2. 12.3 cm
  - 3. 17.5 cm
  - 4. 12.9 cm

Question ID : 65497837519  
Status : Answered  
Chosen Option : 2

**Q.38** Study the given graph and answer the question that follows.

**Production of fertilisers by countries X, Y and Z from 2016 to 2020**  
(in million tonnes)



What is the ratio of the total production of fertilisers by country X in 2017 and country Y in 2020 to the production of fertilisers by country Z in 2019?

- Ans
- 1. 27 : 20
  - 2. 3 : 2
  - 3. 4 : 3
  - 4. 19 : 12

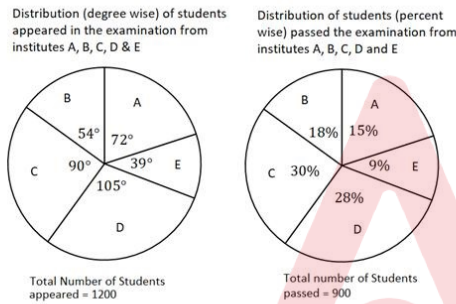
Question ID : 65497837555  
Status : Answered  
Chosen Option : 2

Q.39 Let  $x = \frac{5^{\frac{3}{4}} \times 3^{\frac{3}{4}} \times 15^{\frac{3}{4}} + 2^{\frac{2}{3}} + 1^{\frac{11}{25}}}{\frac{3}{4} + \frac{1}{4} + \frac{3}{5} + \frac{3}{4} + \frac{4}{15}}$ . When  $y$  is added to  $x$ , the result is  $\frac{7}{13}$ . What is the value of  $y$ ?

- Ans
- 1.  $\frac{1}{13}$
  - 2.  $\frac{4}{13}$
  - 3.  $\frac{2}{13}$
  - 4.  $\frac{9}{13}$

Question ID : 65497837469  
Status : Not Answered  
Chosen Option : --

Q.40 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?

- Ans
- 1. D
  - 2. B
  - 3. C
  - 4. E



Question ID : 65497837560  
Status : Answered  
Chosen Option : 1

Q.41 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 one 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?

- Ans
- 1. 8
  - 2. 10
  - 3. 11
  - 4. 9

Question ID : 65497837503  
Status : Answered  
Chosen Option : 2

Q.42

The value of  $\frac{4 \tan^2 30^\circ + \sin^2 30^\circ \cos^2 45^\circ + \sec^2 48^\circ - \cot^2 42^\circ}{\cos 37^\circ \sin 53^\circ + \sin 37^\circ \cos 53^\circ + \tan 18^\circ \tan 72^\circ}$  is:

Ans

1.  $\frac{49}{24}$   
 2.  $\frac{35}{48}$   
 3.  $\frac{35}{24}$   
 4.  $\frac{59}{48}$

Question ID : 65497837551

Status : Answered

Chosen Option : 4

Q.43 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:

Ans

1.  $\frac{5}{52}$   
 2.  $\frac{7}{52}$   
 3.  $\frac{1}{52}$   
 4.  $\frac{3}{52}$

Question ID : 65497837470

Status : Answered

Chosen Option : 1

Q.44 The total surface area of a cylinder is  $4092 \text{ cm}^2$  and the diameter of its base is 21 cm. What is 50% volume (in  $\text{cm}^3$ ) of the cylinder (nearest to an integer)?

Ans

1. 8922  
 2. 8822  
 3. 8932  
 4. 8832

Question ID : 65497837540

Status : Not Answered

Chosen Option : --



**Q.45** Eight years 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?

- Ans
- 1. 112
  - 2. 90
  - 3. 102
  - 4. 80

Question ID : 65497837481  
Status : Answered  
Chosen Option : 3

**Q.46** In  $\Delta PQR$ ,  $S$  is a point on the side  $QR$  such that  $\angle QPS = \frac{1}{2}\angle PSR$ ,  $\angle QPR = 78^\circ$  and  $\angle PRS = 44^\circ$ . What is the measure of  $\angle PSQ$ ?

- Ans
- 1.  $58^\circ$
  - 2.  $56^\circ$
  - 3.  $68^\circ$
  - 4.  $64^\circ$

Question ID : 65497837517  
Status : Answered  
Chosen Option : 4

**Q.47** If  $\sin A = \frac{5}{13}$  and  $7 \cot B = 24$ , then the value of  $(\sec A \cos B)(\operatorname{cosec} B \tan A)$  is:

- Ans
- 1.  $\frac{13}{14}$
  - 2.  $\frac{15}{13}$
  - 3.  $\frac{65}{42}$
  - 4.  $\frac{13}{7}$

Question ID : 65497837550  
Status : Not Attempted and Marked For Review  
Chosen Option : --

**Q.48** 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?

- Ans
- 1. 50%
  - 2. 40%
  - 3. 60%
  - 4. 70%

Question ID : 65497837492  
Status : Answered  
Chosen Option : 3

**Q.49** 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 number of sides of polygons A and B is:

- Ans
- 1. 19
  - 2. 16
  - 3. 18
  - 4. 17

Question ID : 65497837530  
Status : Answered  
Chosen Option : 2

**Q.50** 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  $\text{cm}^2$ ) and the volume (in  $\text{cm}^3$ ) are, respectively:

- Ans
- 1. 2624 and 7040
  - 2. 2560 and 7680
  - 3. 2688 and 7680
  - 4. 2560 and 6400

Question ID : 65497837531  
Status : Answered  
Chosen Option : 2

**Q.51** In  $\triangle ABC$ ,  $M$  is the midpoint of the side  $AB$ .  $N$  is a point in the interior of  $\triangle ABC$  such that  $CN$  is the bisector of  $\angle C$  and  $CN \perp NB$ . What is the length (in cm) of  $MN$ , if  $BC = 10$  cm and  $AC = 15$  cm?

- Ans
- 1. 2.5
  - 2. 2
  - 3. 5
  - 4. 4

Question ID : 65497837523  
Status : Not Answered  
Chosen Option : --

**Q.52** A circle is inscribed in  $\triangle PQR$  touching the sides  $QR, PR$  and  $PQ$  at the points  $S, U$  and  $T$ , respectively.  $PQ = (QR + 5)$  cm,  $PQ = (PR + 2)$  cm. If the perimeter of  $\triangle PQR$  is 32 cm, then  $PR$  is equal to:

- Ans
- 1. 8 cm
  - 2. 11 cm
  - 3. 13 cm
  - 4. 10 cm

Question ID : 65497837528  
Status : Answered  
Chosen Option : 2

**Q.53** If the sum of 40% of a number and 30% of the same number is 70, then the number is:

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

Question ID : 65497837476  
Status : Answered  
Chosen Option : 4

**Q.54** 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:

- Ans
- 1.  $2 - 2\sqrt{2}$
  - 2.  $4 + 2\sqrt{2}$
  - 3.  $4 - 2\sqrt{2}$
  - 4.  $2 + 2\sqrt{2}$

Question ID : 65497837472  
Status : Not Answered  
Chosen Option : --

**Q.55**  $\frac{(1+\sec \theta \operatorname{cosec} \theta)^2 (\sec \theta - \tan \theta)^2 (1+\sin \theta)}{(\sin \theta + \sec \theta)^2 + (\cos \theta + \operatorname{cosec} \theta)^2}$ ,  $0^\circ < \theta < 90^\circ$ , is equal to:

- Ans
- 1.  $\sin \theta$
  - 2.  $1 - \cos \theta$
  - 3.  $1 - \sin \theta$
  - 4.  $\cos \theta$

Question ID : 65497837547  
Status : Not Answered  
Chosen Option : --

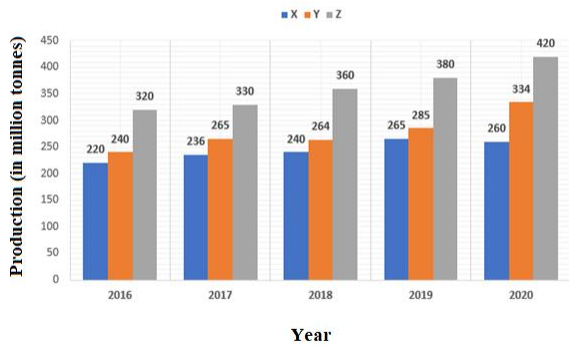
**Q.56** A solid metallic cuboid of dimensions 12 cm × 54 cm × 72 cm is melted and converted into 8 cubes of the same size. What is the sum of the lateral surface areas (in cm<sup>2</sup>) of 2 such cubes?

- Ans
- 1. 2592
  - 2. 2268
  - 3. 1944
  - 4. 3888

Question ID : 65497837542  
Status : Answered  
Chosen Option : 1

Q.57 Study the given graph and answer the question that follows.

Production of fertilisers by countries X, Y and Z from 2016 to 2020  
(in million tonnes)



The average production of fertilisers by country Z in 2017, 2018 and 2020 is what percentage more than the average production of fertilisers by country X in 2018 and 2020?

- Ans
- 1. 45%
  - 2. 32.4%
  - 3. 48%
  - 4. 49.6%

Question ID : 65497837556

Status : Answered

Chosen Option : 3

Q.58 What is the difference (in ₹) between the interests on ₹50,000 for one year at 8% per annum compounded half yearly and yearly?

- Ans
- 1. 100
  - 2. 80
  - 3. 70
  - 4. 50

Question ID : 65497837485

Status : Answered

Chosen Option : 2

Q.59 The radius of the base of a cylindrical tank is 4 m. If three times the sum of the areas of its two circular faces is twice the area of its curved surface, then the capacity (in kilolitres) of the tank is:

- Ans
- 1.  $54\pi$
  - 2.  $96\pi$
  - 3.  $144\pi$
  - 4.  $108\pi$

Question ID : 65497837541

Status : Answered

Chosen Option : 2

**Q.60** 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?

- Ans**
- 1. 14
  - 2. 11
  - 3. 15
  - 4. 13

Question ID : 65497837507  
Status : Answered  
Chosen Option : 4

**Q.61** The radius of a solid right circular cone is 36 cm and its height is 105 cm. The total surface area (in  $\text{cm}^2$ ) of the cone is:

- Ans**
- 1.  $3969\pi$
  - 2.  $4296\pi$
  - 3.  $5292\pi$
  - 4.  $3996\pi$

Question ID : 65497837533  
Status : Not Attempted and Marked For Review  
Chosen Option : --

**Q.62** 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?

- Ans**
- 1. 140%
  - 2. 125%
  - 3. 100%
  - 4. 150%

Question ID : 65497837480  
Status : Answered  
Chosen Option : 1

**Q.63**  $S$  and  $T$  are points on the sides  $PQ$  and  $PR$ , respectively, of  $\Delta PQR$  such that  $PS \times PR = PQ \times PT$ . If  $\angle Q = 96^\circ$  and  $\angle PST = \angle PRQ + 34^\circ$ , then  $\angle QPR = ?$

- Ans**
- 1.  $25^\circ$
  - 2.  $26^\circ$
  - 3.  $22^\circ$
  - 4.  $24^\circ$

Question ID : 65497837524  
Status : Not Answered  
Chosen Option : --

Q.64 If  $3 \tan \theta = 2\sqrt{3} \sin \theta$ ,  $0^\circ < \theta < 90^\circ$ , then the value of  $\frac{\operatorname{cosec}^2 2\theta + \cot^2 2\theta}{\sin^2 \theta + \tan^2 2\theta}$  is:

- Ans
- ✓ 1.  $\frac{20}{39}$
  - ✗ 2.  $\frac{20}{27}$
  - ✗ 3.  $\frac{4}{13}$
  - ✗ 4.  $\frac{4}{3}$

Question ID : 65497837548  
Status : Answered  
Chosen Option : 1

Q.65 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 profit?

- Ans
- ✗ 1. 5.08%
  - ✗ 2. 4.87%
  - ✓ 3. 4.32%
  - ✗ 4. 5.12%

Question ID : 65497837495  
Status : Answered  
Chosen Option : 3

Q.66 If an article is sold for ₹355, there is a loss of 29%. At what price (in ₹) should it be sold to gain 31% of profit?

- Ans
- ✗ 1. 625
  - ✗ 2. 675
  - ✓ 3. 655
  - ✗ 4. 635

Question ID : 65497837491  
Status : Answered  
Chosen Option : 3

Q.67 The value of  $\frac{3(\cot^2 47^\circ - \sec^2 43^\circ) - 2(\tan^2 23^\circ - \operatorname{cosec}^2 67^\circ)}{\operatorname{cosec}^2 (68^\circ + \theta) - \tan(\theta + 61^\circ) - \tan^2 (22^\circ - \theta) + \cot(29^\circ - \theta)}$  is:

- Ans
- ✓ 1. -1
  - ✗ 2. 0
  - ✗ 3. 5
  - ✗ 4. 1

Question ID : 65497837552  
Status : Not Answered  
Chosen Option : --

**Q.68** 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  $y = 0$ ?

- Ans
- ✓ 1. 14
  - ✗ 2. 11.5
  - ✗ 3. 10.5
  - ✗ 4. 12

Question ID : 65497837516  
Status : Not Answered  
Chosen Option : --

**Q.69** A tap can fill a tank in  $5\frac{1}{2}$  hours. Because of a leak, it took  $8\frac{1}{4}$  hours to fill the tank. In how much time (in hours) will the leak alone empty 30% of the tank?

- Ans
- ✗ 1.  $\frac{17}{2}$
  - ✗ 2.  $\frac{5}{2}$
  - ✗ 3.  $\frac{9}{2}$
  - ✓ 4.  $\frac{99}{20}$

Question ID : 65497837504  
Status : Answered  
Chosen Option : 4

**Q.70** 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)

- Ans
- ✓ 1. 20.3% of increase
  - ✗ 2. 19.75% of decrease
  - ✗ 3. 18.5% of decrease
  - ✗ 4. 21.9% of increase

Question ID : 65497837479  
Status : Answered  
Chosen Option : 1

**Q.71** The value of  $\left(2\frac{6}{7} \text{ of } 4\frac{1}{5} \div \frac{2}{3}\right) \times 5\frac{1}{9} \div \left(\frac{3}{4} \times 2\frac{2}{3} \text{ of } \frac{1}{2} \div \frac{1}{4}\right)$  is:

- Ans
- ✗ 1. 19
  - ✓ 2. 23
  - ✗ 3. 25
  - ✗ 4. 21

Question ID : 65497837463  
Status : Not Answered  
Chosen Option : --



Q.72 The income of A is  $\frac{2}{3}$  of B's income and the expenditure of A is  $\frac{3}{4}$  of B's expenditure. If  $\frac{1}{3}$  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:

- Ans
- 1. 5 : 3
  - 2. 4 : 3
  - 3. 3 : 5
  - 4. 3 : 4

Question ID : 65497837475

Status : Answered

Chosen Option : 3

Q.73 If a, b and c are positive numbers such that  $(a^2 + b^2) : (b^2 + c^2) : (c^2 + a^2) = 34 : 61 : 45$ , then  $b - a : c - b : c - a =$  \_\_\_\_\_.

- Ans
- 1. 1 : 2 : 3
  - 2. 3 : 1 : 2
  - 3. 2 : 1 : 3
  - 4. 3 : 2 : 1

Question ID : 65497837483

Status : Answered

Chosen Option : 3

Q.74 Let  $x = (433)^{24} - (377)^{38} + (166)^{54}$ . What is the units digit of  $x$  ?

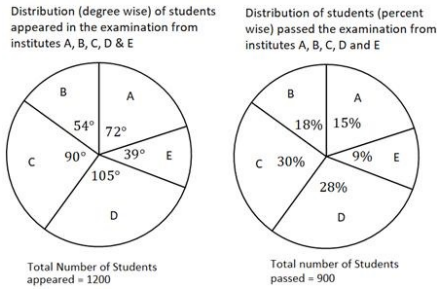
- Ans
- 1. 7
  - 2. 6
  - 3. 8
  - 4. 9

Question ID : 65497837462

Status : Answered

Chosen Option : 3

Q.75 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?

- Ans
- 1. 52.1%
  - 2. 56.25%
  - 3. 54.25%
  - 4. 58.3%

Question ID : 65497837559  
Status : Answered  
Chosen Option : 2

Q.76 The surface area of a sphere is  $221.76 \text{ cm}^2$ . Its volume (in  $\text{cm}^3$ ) is (correct to one decimal place):

(Take  $\pi = \frac{22}{7}$ )

- Ans
- 1. 289.8
  - 2. 315.6
  - 3. 280.4
  - 4. 310.5

Question ID : 65497837535  
Status : Answered  
Chosen Option : 3

Q.77 The value of  $\frac{1}{4} + \frac{[(20.35)^2 - (8.35)^2] \times 0.0175}{(1.05)^2 + (1.05)(27.65)}$  is:

- Ans
- 1.  $\frac{9}{20}$
  - 2.  $\frac{3}{10}$
  - 3.  $\frac{7}{20}$
  - 4.  $\frac{3}{20}$

Question ID : 65497837468  
Status : Not Answered  
Chosen Option : --

**Q.78** The angle of elevation of the top of a tower  $25\sqrt{3}$  m high from two points on the level ground on its opposite sides are  $45^\circ$  and  $60^\circ$ . What is the distance (in m) between the two points (correct to one decimal place)?

- Ans
- 1. 58.4
  - 2. 68.3
  - 3. 50.6
  - 4. 45.3

Question ID : 65497837553  
Status : Answered  
Chosen Option : 2

**Q.79**  $O$  is a point in the interior of  $\Delta ABC$  such that  $OA = 12$  cm,  $OC = 9$  cm,  $\angle AOB = \angle BOC = \angle COA$  and  $\angle ABC = 60^\circ$ . What is the length (in cm) of  $OB$ ?

- Ans
- 1.  $6\sqrt{2}$
  - 2.  $4\sqrt{6}$
  - 3.  $6\sqrt{3}$
  - 4.  $4\sqrt{3}$

Question ID : 65497837525  
Status : Not Answered  
Chosen Option : --

**Q.80** In  $\Delta ABC$ ,  $\angle B = 78^\circ$ ,  $AD$  is a bisector of  $\angle A$  meeting  $BC$  at  $D$ , and  $AE \perp BC$  at  $E$ . If  $\angle DAE = 24^\circ$ , then the measure of  $\angle ACB$  is:

- Ans
- 1.  $38^\circ$
  - 2.  $42^\circ$
  - 3.  $30^\circ$
  - 4.  $32^\circ$

Question ID : 65497837521  
Status : Answered  
Chosen Option : 3

**Q.81**  $\left(\frac{\tan^3 \theta}{\sec^2 \theta} + \frac{\cot^3 \theta}{\operatorname{cosec}^2 \theta} + 2 \sin \theta \cos \theta\right) \div (1 + \operatorname{cosec}^2 \theta + \tan^2 \theta)$ ,  $0^\circ < \theta < 90^\circ$ , is equal to:

- Ans
- 1.  $\sec \theta$
  - 2.  $\operatorname{cosec} \theta \sec \theta$
  - 3.  $\sin \theta \cos \theta$
  - 4.  $\operatorname{cosec} \theta$

Question ID : 65497837545  
Status : Not Answered  
Chosen Option : --

Q.82 Let  $0^\circ < \theta < 90^\circ$ .  $(1 + \cot^2 \theta)(1 + \tan^2 \theta) \times (\sin \theta - \operatorname{cosec} \theta)(\cos \theta - \sec \theta)$  is equal to:

- Ans
- 1.  $\sec \theta + \operatorname{cosec} \theta$
  - 2.  $\sin \theta \cos \theta$
  - 3.  $\sin \theta + \cos \theta$
  - 4.  $\sec \theta \operatorname{cosec} \theta$

Question ID : 65497837546  
Status : Answered  
Chosen Option : 4

Q.83 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  $\frac{9}{16}$ , which exceeds  $y$  by  $0.0625$ . If  $x + y + z = 2\frac{3}{12}$ , then what is the value of  $x + z$ ?

- Ans
- 1.  $\frac{7}{4}$
  - 2.  $\frac{3}{4}$
  - 3.  $\frac{1}{4}$
  - 4.  $\frac{5}{4}$

Question ID : 65497837471  
Status : Answered  
Chosen Option : 1

Q.84 If  $a + b = 8$ ,  $ab = 10$ , then the value of  $a^3 + b^3$  is:

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

Question ID : 65497837510  
Status : Answered  
Chosen Option : 3

Q.85 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?

- Ans
- 1.  $25 : 26$
  - 2.  $25 : 52$
  - 3.  $26 : 25$
  - 4.  $52 : 25$

Question ID : 65497837498  
Status : Answered  
Chosen Option : 4

**Q.86** The volume of a solid cylinder is  $2002 \text{ cm}^3$  and its height is  $13 \text{ cm}$ . What is the area (in  $\text{cm}^2$ ) of its base?

(Take  $\pi = \frac{22}{7}$ )

- Ans**
- 1. 154
  - 2. 308
  - 3. 77
  - 4. 231

Question ID : 65497837538

Status : Answered

Chosen Option : 1

**Q.87** The sum of and difference between the LCM and HCF of two numbers are 512 and 496, respectively. If one number is 72, then the other number is:

- Ans**
- 1. 56
  - 2. 40
  - 3. 80
  - 4. 64

Question ID : 65497837465

Status : Answered

Chosen Option : 1

**Q.88** The value of  $\left(1\frac{1}{3} \div 2\frac{6}{7} \text{ of } 5\frac{3}{5}\right) \times \left(6\frac{2}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3}\right) \div \left(\frac{3}{4} \times 2\frac{2}{3} \div \frac{5}{9} \text{ of } 1\frac{1}{5}\right) = k$ , where k lies between:

- Ans**
- 1. 0.007 and 0.008
  - 2. 0.7 and 0.8
  - 3. 0.0007 and 0.0008
  - 4. 0.07 and 0.08

Question ID : 65497837467

Status : Not Answered

Chosen Option : --

**Q.89** In  $\triangle LMN$ ,  $LM = 5\sqrt{2} \text{ cm}$ ,  $LN = 13 \text{ cm}$  and  $\angle LMN = 135^\circ$ . What is the length (in cm) of  $MN$ ?

- Ans**
- 1.  $7\sqrt{2}$
  - 2. 8
  - 3. 7
  - 4.  $8\sqrt{2}$

Question ID : 65497837522

Status : Not Answered

Chosen Option : --

**Q.90** A and B can do a work in  $26\frac{2}{3}$  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?

- Ans
- 1. 20
  - 2. 24
  - 3. 32
  - 4. 36

Question ID : 65497837505  
Status : Answered  
Chosen Option : 3

**Q.91** If  $a + b + c = 1$ ,  $ab + bc + ca = -22$  and  $abc = -40$ , then what is the value of  $a^3 + b^3 + c^3$ ?

- Ans
- 1. -53
  - 2. 27
  - 3. 67
  - 4. -51

Question ID : 65497837513  
Status : Answered  
Chosen Option : 2

**Q.92** When the price 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:

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

Question ID : 65497837477  
Status : Not Answered  
Chosen Option : --

**Q.93** 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)?

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

Question ID : 65497837508  
Status : Not Answered  
Chosen Option : --

Q.94  $\frac{1+\cos\theta-\sin^2\theta}{\sin\theta(1+\cos\theta)} \times \frac{\sqrt{\sec^2\theta+\operatorname{cosec}^2\theta}}{\tan\theta+\cot\theta}$ ,  $0^\circ < \theta < 90^\circ$ , is equal to:

- Ans
- 1.  $\cot\theta$
  - 2.  $\tan\theta$
  - 3.  $\operatorname{cosec}\theta$
  - 4.  $\sec\theta$

Question ID : 65497837544  
Status : Not Answered  
Chosen Option : --

Q.95 A person marks an article 36% above the cost price and offers 30% discount on the marked price. What is the loss or gain percentage?

- Ans
- 1. Loss 6.5%
  - 2. Loss 4.8%
  - 3. Gain 8.5%
  - 4. Gain 7.2%

Question ID : 65497837493  
Status : Not Answered  
Chosen Option : --

Q.96 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 ₹5,808, then 60% of the total interest (nearest to a ₹) charged in this scheme is:

- Ans
- 1. 913
  - 2. 911
  - 3. 917
  - 4. 922

Question ID : 65497837487  
Status : Not Answered  
Chosen Option : --

Q.97 If the amount obtained by A by investing ₹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 ₹) is:

- Ans
- 1. 8,540
  - 2. 8,450
  - 3. 7,800
  - 4. 7,605

Question ID : 65497837488  
Status : Not Answered  
Chosen Option : --



**Q.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?

- Ans**
- ✓ 1. 174.4%
  - ✗ 2. 73.6%
  - ✗ 3. 74.4%
  - ✗ 4. 173.6%

Question ID : 65497837536  
Status : Not Answered  
Chosen Option : --

**Q.99** If  $7 \sin^2 \theta + 4 \cos^2 \theta = 5$  and  $\theta$  lies in the first quadrant, then what is the value of  $\frac{\sqrt{3} \sec \theta + \tan \theta}{\sqrt{2} \cot \theta - \sqrt{3} \cos \theta}$  ?

- Ans**
- ✗ 1.  $3\sqrt{2}$
  - ✗ 2.  $2(\sqrt{2} - 1)$
  - ✗ 3.  $4\sqrt{2}$
  - ✓ 4.  $2(1 + \sqrt{2})$

Question ID : 65497837549  
Status : Not Answered  
Chosen Option : --

**Q.100** If  $x = \sqrt{1 + \frac{\sqrt{3}}{2}} - \sqrt{1 - \frac{\sqrt{3}}{2}}$ , then the value of  $\frac{\sqrt{3}-x}{\sqrt{3}+x}$  (corrected to two decimal places) is:

- Ans**
- ✗ 1. 0.25
  - ✓ 2. 0.27
  - ✗ 3. 0.17
  - ✗ 4. 0.19

Question ID : 65497837473  
Status : Not Answered  
Chosen Option : --