BOARD QUESTION PAPER 2015

Section A

Objective Type Questions

Q. 1. (A) Choose the correct option and write it in your answer-book : $1 \times 5 = 5$

1. **If $a_1b_2 \neq a_2b_1$ then the system of equations $a_1x + b_1y = c_1$ and $a_2x + b_2y = c_2$:**
   (a) Has a unique solution (b) Has no solution
   (c) Has infinitely many solutions (d) Has two solutions.
2. **The coordinates of intersection points of lines $x + y = 7$ and $x - y = 3$ will be :**
   (a) (4, 3) (b) (7, 4) (c) (5, 2) (d) (6, 1).
3. **Zeros of $x^2 - 2x$ are :**
   (a) –2, 0 (b) 2, –2 (c) 0, 2 (d) 1, 2.
4. **If $P = \frac{1}{x+1}$ and $Q = \frac{x^2-1}{x-1}$, then value of $P.Q$ is :**
   (a) $x + 1$ (b) 1 (c) $x - 1$ (d) $x^2 - 1$.
5. **The third proportional to 8, 12 is :**
   (a) 18 (b) 8 (c) 4 (d) 20.

Ans. 1. (a), 2. (c), 3. (c), 4. (b), 5. (a).

Q. 2. Match the Columns : $1 \times 5 = 5$

'A'	'B'
1. $\sin 30°$	(a) 0
2. $\sqrt{\sec^2\theta - 1}$	(b) $\operatorname{cosec}\theta$
3. $\sin 55° - \cos 35°$	(c) $\sin\theta$
4. $\frac{\sec\theta}{\tan\theta}$	(d) $\cot\theta$
5. $\frac{\sqrt{1-\sin^2\theta}}{\sin\theta}$	(e) $\cos 60°$
	(f) $\tan\theta$.

Ans. 1. (e), 2. (f), 3. (a), 4. (b), 5. (d).

Q. 3. Fill in the blanks : **$1 \times 5 = 5$**

1. An equation whose maximum degree of variable is two is called ..... equation.
2. The reduction in price of the article with time is called ..... .
3. If the corresponding angles of two triangles are equal then the triangles are.....
4. The solid bounded by two concentric sphere is called ..... .
5. The line segment joining the two point on the circumference of the circle is called ..... .

Ans. 1. quadratic, 2. Depriciation, 3. similar, 4. spherical shell, 5. chord.

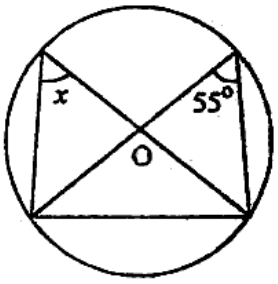
Q. 4. Write True/False in the following : **1 × 5 = 5**

1. The service tax is an indirect tax.
2. The statement of Thales theorem is : "If a line divides any two sides of a triangle in the same ratio, then the line must be parallel to the third side."
3. A circle can be drawn passing through three non collinear points.
4. The length of two tangents drawn from an external point to a circle are unequal.
5. A line joining the object under consideration with eye is known as line of sight.

Ans. 1. True, 2. False, 3. True, 4. True, 5. True.

Q. 5. Write the answer is one word/sentence each : **1 × 5 = 5**

1. What is the present rate of education cess ?
2. What will be the value of x in the figure given bellow :



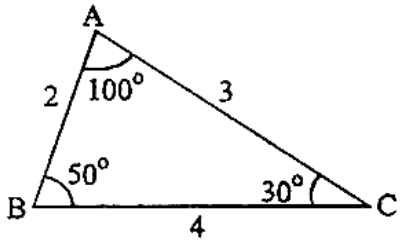
3. Write the ratio between the volumes of cylinder and cone which have same radius and height.
4. Write the probability of sure event.
5. Find the mode of the following observation : 2, 3, 4, 2, 12, 8, 7, 9, 8, 6, 8, 5, 8.

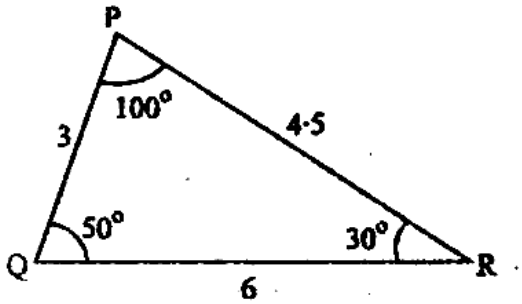
Ans. 1. 3%, 2. 55°, 3. 3 : 1, 4. 1, 5. 8.

Q. 6. **Write the statement of Pythagoras theorem.** **2**

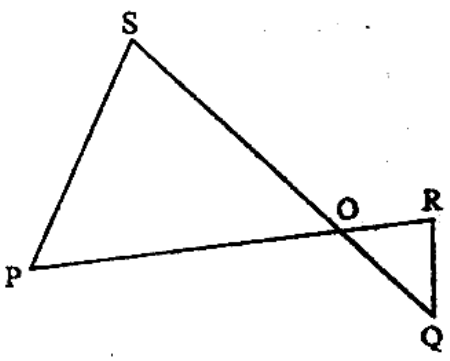
Or, **Check whether 8 cm, 15 cm and 17 cm are the sides of right angled triangle.**

Q. 7. **Are these triangles similar ? If yes, then why ? If no, then why ?** **2**

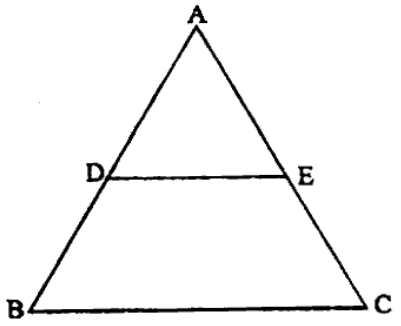




Or, **In the figure given below $\Delta POS \sim \Delta ROQ$, Prove that $PS \parallel QR$.**



Q. 8. In the figure given below $DE \| BC$. If $\frac{AD}{DB} = \frac{2}{5}$ and side $EC = 10$ cm find AE. 2



Or, If the areas of two similar triangles are equal. Prove that the triangles are congruent.

Q. 9. Find the median of the following values of Variate : 15, 35, 18, 26, 19, 25, 29, 20, 27. 2

Or, Find the mean of all factors of 20.

Q. 10. If the probability of raining tomorrow is $\frac{2}{3}$ then what will be the probability of not raining tomorrow. 2

Or, Two coins are tossed simultaneously. Find the probability of getting Head on one coin and Tail on another coin.

Q. 11. Solve the following system of equation by elimination method :

$$3x + 2y = 11, 2x + 3y = 4.$$ 4

Or, Solve the following system of equations by Paravartya method of Vedic mathematics :

$$2x + y = 5, 3x - 4y = 2.$$

Q. 12. The sum of two numbers is 80 and the first number is 20 more than the second. Find the numbers. 4

Or, The cost of 2 chairs and 3 tables is Rs. 800 and the cost of 4 chairs and 3 tables is Rs. 1000. Find the cost of 2 chairs and 2 tables.

Q. 13. If $\frac{x}{a} = \frac{y}{b} = \frac{z}{c}$ then prove that $\frac{x^3}{a^3} - \frac{y^3}{b^3} + \frac{z^3}{c^3} = \frac{xyz}{abc}$. 4

Or, If q is the mean proportional of p and r then prove that :

$$p^2 - q^2 + r^2 = q^4\left(\frac{1}{p^2} - \frac{1}{q^2} + \frac{1}{r^2}\right).$$

Q. 14. Solve the equation $x^2 - 5x - 6 = 0$ by formula method. 4

Or, Find the value of p in the equation $2py^2 - 8y + p = 0$ so that the equation has equal roots.

Q. 15. At a distance of 30 m away from the tower, the angle of elevation of the top of the tower is 30°. Find the height of the tower. 4

Or, From the top of 60 m high house, the angle of depression of the ship is 60°. Find the distance between the ship and the foot of the light house.

Q. 16. In a circle an arc subtends an angle 45° at the centre. If the length of arc is 11 cm then find the radius of circle. 4

Or, If V is the volume of cuboid whose length is 'a', breadth is 'b' and height is 'c' and 's' is its surface area then prove that : $\frac{1}{V} = \frac{2}{S}\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$.

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Q. 17. The radius of a cone is 7 cm and its height is 9 cm. The volume of this cone is equal to lateral surface area of another cone which has same radius. Find the slant height of the cone. 4

Or, A cylinder of height 90 cm and base diameter 8 cm is melted and recast into spheres of diameter 12 cm. Find the number of spheres.

Q. 18. Find cyclic factors : $x(y^2+z^2)+y(z^2+x^2)+z(x^2+y^2)+2xyz$. 5

Or, Which rational expression should be subtracted from $\frac{x^2+1}{x-1}$ get $\frac{x-3}{x+1}$?

Q. 19. If α and β are roots of quadratic equation $ax^2+bx+c=0$, then find $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$. 5

Or, The length of rectangle is 5 cm more than its breadth. If the area of the rectangle is 150 sq. cm. Find the sides of rectangle.

Q. 20. Find the compound interest on Rs. 8,000 for the period of $1\frac{1}{2}$ years at the rate of interest 10% per annum, if the interest is compounded half yearly. 5

Or, A watch is sold for Rs. 960 cash or for Rs. 480 cash down payment and two monthly installments of Rs. 245 each. Find the rate of interest charged under the instalment plan.

Q. 21. Construct the incircle of the equilateral triangle whose one side is 8 cm and write the steps of construction also. 5

Or, Construct a cyclic quadrilateral $ABCD$ in which vertical angle $\angle B = 65^\circ$, $AB = 4$ cm. $AC = 6$ cm, $AD = 4$ cm. Write the steps of construction also.

Q. 22. Prove the following identity : $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = (\sec\theta - \tan\theta)$. 5

Or, Simplify : $(\sec\theta+\tan\theta)(1-\sin\theta)$.

Q. 23. If PAB is a secant to a circle with centre O intersecting the circle at A and B and PT is tangent segment, then prove that $PA.PB = PT^2$. 6

Or, In a circle of radius 5 cm, AB and AC are the two chords such that $AB = AC = 6$ cm. Find the length of chord BC.

Q. 24. Find the mode of the following frequency table : 6

Class interval	140—150	150—160	160—170	170—180	180—190	190—200
Frequency	4	6	10	12	9	3

Or, Calculate the cost of living index number for the year 1995 on the basis of year 1990 from the following data :

Item	Quantity (in kg)	Cost (in Rs.) per Kg.	
		year 1990	year 1995
A	8	30·00	45·00
B	5	28·00	36·00
C	12	6·00	11·00
D	40	9·00	15·00
E	18	10·00	12·00