

KOL

Sent-up Examination-2018

Class - X
Subject-Maths

Time : 3 Hrs.

Full Marks-90

1. Choose the correct answer : 1x6=6

i) The fourth proportion of 3,4 & 6 is

a) 8 (b) 10 (c) 12 (d) 24

ii) ABC is a triangle, $\sin\left(\frac{B+C}{2}\right) =$ a) $\sin\frac{A}{2}$ (b) $\cos\frac{A}{2}$ (c) $\sin A$ (d) $\cos A$

iii) If the mode of the data 16,15,17,16,15, x, 19,17,14 is 15 then the value of x is -

iv) If the total interest becomes Rs. x for any principal having the rate of simple interest of x% per annum for x years then the principal will be

a) Rs. x (b) Rs. 100x (c) Rs. $\frac{100}{x}$ (d) Rs. $\frac{100}{x^2}$ v) If $\angle A = 100^\circ$ of a cyclic quadrilateral ABCD, then the value of $\angle C$ is -a) 50° (b) 200° (c) 80° (d) 180° .

vi) If the ratio of curved surface areas of two solids spheres is 16:9, the ratio of their volumes is :

a) 64:27 (b) 4:3 (c) 27:64 (d) 3:4

2. Fill up the blanks (any five) : 1x5=5

i) The ratio of the sum and product of two roots of the equation $7x^2 - 12x + 18 = 0$ is _____

ii) A cyclic parallelogram is a _____ picture

iii) If $\sin(\theta - 30^\circ) = \frac{1}{2}$ then the value of $\cos\theta$ is _____

iv) At the time of finding arithmetic mean, the length of all classes are _____.

v) If the volume of a right circular cone is V cubic unit and the base area is A sq. unit then its height is _____

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vi) If a principal becomes twice of its amount in 10 years, the rate of simple interest per annum is ____

3. Write true and false (any five) : $1 \times 5 = 5$

i) The compound interest will be always less than simple interest for some money at fixed rate of interest for fixed time ____

ii) O is the midpoint of the side AB of the triangle ABC and $OA=OB=OC$, if we draw a circle with side AB as diameter, then the circle passes through the point C.

iii) Compound ratio of $ab:c^2$, $bc:a^2$ and $ca:b^2$ is 1:1

iv) The value of $\cos 54^\circ$ and $\sin 36^\circ$ are equal.

v) Median of data 3, 14, 18, 20, 5 is 18

vi) If we double the length of radius of a solid sphere, the volume of sphere will be doubled.

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4. Answer the following question (Any ten) : $2 \times 10 = 20$

i) In partnership business the ratio of capitals of samir, Idrish and antony are as $\frac{1}{6} : \frac{1}{5} : \frac{1}{4}$; if they make a profit of Rs. 3700 at the end of the year, let us write by calculating profit share of Antony.

ii) Write the rate of compound interest per annum, so that the amount on Rs. 400 for two years becomes Rs. 441.

iii) Write the quadratic equation if sum of its roots is 14 and the product of them is 24.

iv) If $x = 3 + 2\sqrt{2}$ write the value of $x + \frac{1}{x}$.

v) A line parallel to the side BC of $\triangle ABC$ intersects the side AB and AC at the point P & Q respectively if $PB=AQ$, $AP=9$ units, $QC=4$ units, then let us calculate the length of PB.

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vi) The radius of the circle with centre O is 5 cm. P is a point at a distance 13 cm from O. PQ and PR are two tangents of this circle. Find the area of the quadrilateral PQOR.

vii) If two chords AB and CD of a circle with centre O, when produced intersect each other at the point P. prove that $\angle AOC = \angle BOD = 2\angle BPC$

viii) Calculate the value of $(\sin^2\theta + \cos^2\theta + 3\sin^2\theta\cos^2\theta)$

ix) If the angle of elevation of a kite is 60° and the length of thread is $20\sqrt{3}$ metre. Let us calculate the height of the kite above the ground.

x) By melting solid iron sphere with 8 cm radius, How many marble balls of 1 cm ^{radius} diameter can be obtained—Let us write by calculating it.

xi) determine the ratio of the volumes of a solid right circular cone and a solid sphere of equal diameter and equal height. <http://www.wbbseonline.com>

xii) If $\sum_{i=1}^n i^2 = 25$, $\sum_{i=1}^n i = 20$ and $\sum_{i=1}^n 1 = 100$, us find the value of n

5. Answer any one question :

1x5=5

i) Three friends invested Rs. 120000, Rs. 150000 and Rs. 1,10,000 respectively to purchase a bus. The first person is a driver and other two are conductors. They decided to divided $\frac{2}{5}$ th of the profit among themselves in the ratio of 3:2:2 according to their work and the remaining in the ratio of their capitals. If they earn Rs. 29260 in One month, find the share of each of them.

ii) The price of a machine of a factory is Rs. 18000. The price of that machine decreases by 10% in each year. Calculate its price after 3 years.

6. Answer any one question :

1x3=3

i) Simplify $\frac{x+\sqrt{x^2-1}}{x-\sqrt{x^2-1}} + \frac{x-\sqrt{x^2-1}}{x+\sqrt{x^2-1}}$

- ii) If two digit positive number is multiplied by its unit digit, then the product is 189 and if the tens digit is twice of the unit digit, then let us calculate unit digit.

7. Answer any one question :

1x3=3

i) Simplify $\frac{\sqrt{5}}{\sqrt{3} \cdot \sqrt{2}} - \frac{3\sqrt{3}}{\sqrt{2} \cdot \sqrt{5}} + \frac{2\sqrt{2}}{\sqrt{3} \cdot \sqrt{5}}$

- ii) If $\frac{x}{y} + x + y$ and $\frac{y}{x} + x - y$ show that $x^2 - y^2 = \text{constant}$

8. Answer any one question :

1x3=3

- i) If $(7x-5y) : (3x+4y) = 7:11$ show that

$$(3x-2y) : (3x+4y) = 127:473$$

- ii) If a,b,c,d are in continued proportion, Let us show that $(a^2-b^2)(c^2-d^2) = (b^2-c^2)^2$

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9. Answer any one question :

1x5=5

- i) If in $\triangle ABC$, $\angle A$ is right angle and BP, and CQ are two medians, then prove that $5BC^2 = 4(BP^2 + CQ^2)$
- ii) Prove that the tangent and the radius through the point of contact of a circle are perpendicular to each other.

10. Answer any one question :

1x3=3

- i) Prove that with reason that the middle point of hypotenuse of any right angled triangle is equidistance from three vertices.
- ii) A straight line intersects one of the two concentric circles at the points A & B and other at the point C and D. Prove that $AC=BD$.

11. Answer any one question :

1x5=5

- i) Draw a circle with radius of 2.6 cm length and draw a tangent on this circle from an external point at a

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distance of 5.7 cm from the centre of that circle (only traces of construction are required)

- ii) Construct a triangle is a right-angled of which the length of hypotenuse is 9 cm and another side 6.5 cm. Construct the circumcircle of the triangle (only traces of construction are required).

12. Answer any two question :

2x2=4

- i) Express 85.12° into degrees, minutes and seconds.

ii) ~~If $\sin 17^\circ = \frac{x}{y}$~~ , show that $\sec^2 12^\circ - \frac{1}{\tan^2 78^\circ} = 1$

iii) Prove that $\tan 7^\circ \tan 23^\circ \tan 60^\circ \tan 67^\circ \tan 83^\circ = \sqrt{3}$

13. Answer any one question :

1x5=5

- i) The length of the flag at the roof of three storied building is 3.3 m. From any point of road, the angle of elevation of the top and foot of the flag post are 50° and 45° write by calculating the height of three-storied building. [Let, $\tan 50^\circ = 1.192$].

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- ii) A vertical post of 126 dm height was bent at some point above the ground and just touched the ground making an angle of 30° with the ground. Let us write by calculating at what height was the post bent and at what distance did it meet the ground from the foot of the post.

14. Answer any two question :

2x4=8

- i) If the length of the diagonal of a cube is $4\sqrt{3}$ cm, then calculate the total surface area of the cube.
- ii) If a gas cylinder for fuel purpose having the length of 7.5 dcm and the length of the inner diameter of 2.8 dcm carries 15.015 kg of gas, let us write by calculating the weight of the gas of per cubic dcm.
- iii) determine the volume of a solid right circular cone which can be made from a solid wooden cube of 4.2 dcm. edge length by wasting minimum quantity of wood.

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15. Answer any two question :

2x4=8

- i) If the arithmetic mean of the data given below is 20.6, let us find the value of 'a'.

Variable (xi)	10	15	a	25	35
Frequency (fi)	3	a	25	7	5

- ii) Find the median from given data

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	8	10	24	16	15	7

- iii) draw ogive of the following frequency distribution, draw a greater than ogive.

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	7	10	23	50	6	4