

**C-3-Z**

Roll No.....

Total No. of Questions : **20+20**

[Total No. of Printed Pages : **16**

**XBAKD2021**

**3603-Z**

**MATHEMATICS**

**(New/Old Course)**

**Time : 3 Hours]**

**[Maximum Marks : 100**

**NOTE :—** The questions in the question paper are based on revised and pre-revised syllabus marked as “**New Course**” and “**Old Course**” respectively and candidates are advised to appear in the relevant course meant for them. Candidates who may attempt the questions partly from “**New Course**” and partly from “**Old Course**” will not be awarded. Candidates are also advised to record “**New Course**” or “**Old Course**” as the case may be, on the front page of the answer-book.

**(New Course)**

1. Given below are four alternatives to each. Choose correct one.

(i) One of the following is irrational number, identify :

(A)  $\sqrt{225}$

(B) 3.121221222.....

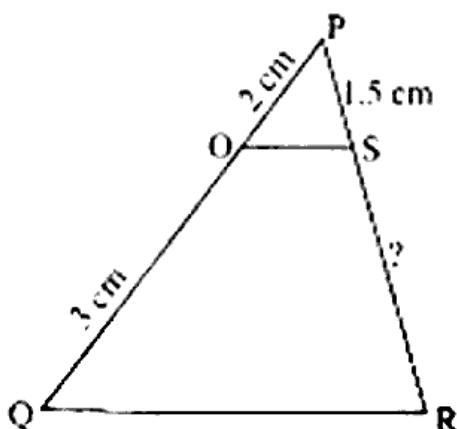
(C)  $3.\overline{143}$

(D)  $\frac{0}{7}$



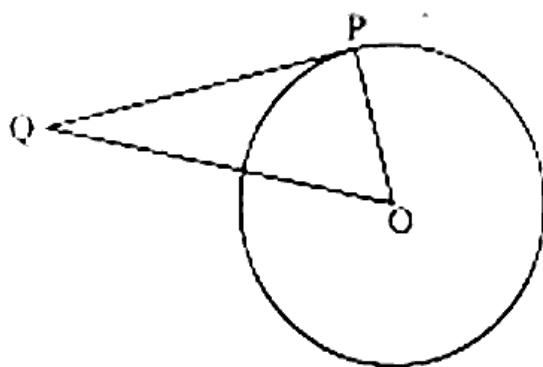
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2. In the given  $\triangle PQR$ ,  $OS \parallel QR$ . Find  $SR$ .



3. Find the distance between the points  $(2, 3)$  and  $(4, 1)$ . 2

4. In the given figure,  $PQ$  is the tangent and  $PO$  the radius of the circle. If  $\angle QOP = 70^\circ$ , find  $\angle PQO$ . 2



5. Given that :

$$\text{HCF (306, 657)} = 9, \text{ find LCM (306, 657).} \quad 4$$

6. Check if the polynomial  $p(x) = x^3 - 3$  is the factor of polynomial :

$$g(x) = 2x^4 + 3x^3 - 2x^2 - 9x - 12 \quad 4$$

7. Find the roots of  $x^2 - 6x + 9 = 0$  by factorisation method. 4

8. The length of a tangent from a point 'A' at a distance of 5 cm from the centre of circle is 4 cm. Find the radius of the circle. 4

9. Find the difference between the areas of two circles whose radii are 7 cm and 3.5 cm. 4

10. A die whose six faces are marked as **A** **B** **C** **D** **E** **A** is thrown once. What is the probability of getting :  
 (i) Face having **A** on it  
 (ii) Face having **E** on it ? 4

11. Solve the following pair of linear equations :

$$\frac{3x}{2} - \frac{5y}{3} = -2$$

and

$$\frac{x}{3} + \frac{y}{2} = \frac{13}{6}$$

Or

Five years ago, Noori was thrice as old as Sonu. Ten years later, Noori will be twice as old as Sonu. What are their present ages ? 6

12. Find two numbers whose sum is 27 and product is 182.

Or

Find the roots of the given quadratic equation by the method of completing the square :

$$2x^2 + x - 4 = 0$$

13. A sum of ₹ 700 is to be used to give seven prizes to the students of a school for their overall academic performance. If each prize is ₹ 20 less than its preceding prize. Find the value of each of the prizes.

*Or*

If the 3rd and 9th terms of an AP are 4 and -8 respectively, which term of this AP is zero(0) ?

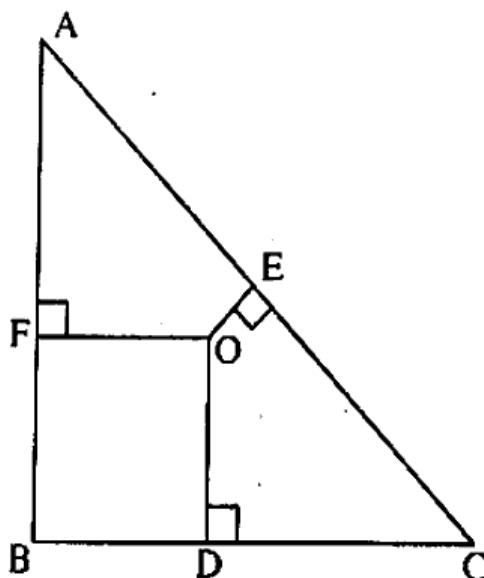
6

14. Prove that the sum of the squares of the sides of a Rhombus is equal to the sum of the squares of its diagonals.

*Or*

In the given figure, O is a point interior of  $\triangle ABC$ ,  $OD \perp BC$ ,  $OE \perp AC$  and  $OF \perp AB$ . Show that :

$$\begin{aligned} OA^2 + OB^2 + OC^2 - OD^2 - OE^2 - OF^2 \\ = AF^2 + BD^2 + CE^2 \end{aligned}$$



6

15. Find the point on  $x$ -axis which is equidistant from (2, -5) and (-2, 9). 6

Or

Find the coordinates of a point which divide the join of (-1, 7) and (4, -3) internally in the ratio 2 : 3. 6

16. Prove that :

$$(\operatorname{cosec} \theta - \cot \theta)^2 = \frac{1 - \cos \theta}{1 + \cos \theta}$$

where  $\theta$  is acute angle.

Or

In  $\triangle PQR$ , right angled at Q,  $PR + QR = 25$  cm and  $PQ = 5$  cm.

Determine the value of  $\sin P$ ,  $\cos P$  and  $\tan P$ . 6

17. The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower is  $30^\circ$ . Find the height of the tower.

Or

A tree breaks due to storm and the broken part bends so that top of the tree touches the ground making an angle  $30^\circ$  with it. The distance between the foot of the tree to the point where the top touches the ground is 8 m. Find the height of the tree. 7

18. Draw a  $\Delta ABC$  in which  $BC = 6$  cm,  $AB = 5$  cm and  $\angle ABC = 60^\circ$ .

Then construct a triangle whose sides are  $\frac{3}{4}$ th of corresponding sides of  $\Delta ABC$ .

*Or*

Draw a circle of radius 3 cm. From a point 5 cm away from its centre, construct a pair of tangents to the circle and find their length.

19. A 20 m deep well (cylindrical) with diameter 7 m is dug and the soil from the digging is evenly spread out to form a platform 22 m by 14 m. Find the height of the platform.

*Or*

The slant height of the frustum of a cone is 4 cm and the perimeter (circumference) of its circular ends are 18 cm and 6 cm. Find the total surface area of the frustum.

20. Given below is the distribution of daily wages of 50 workers of a factory. Find the mean daily wages of the workers :

Daily Wages (in ₹)	500–520	520–540	540–560	560–580	580–600
Number of Workers	12	14	8	6	10

*Or*

The given distribution shows the runs scored by some top batsmen of the world in one-day international cricket matches. Find the mode of the data :

Runs Scored	No. of Batsmen
3000—4000	4
4000—5000	18
5000—6000	9
6000—7000	7
7000—8000	6
8000—9000	3
9000—10000	1
10000—11000	1