No of printed pages: 4

INDIAN SCHOOL SOHAR
PERIODIC TEST III
MATHEMATICS

STD: X **Marks: 80**

07-01-18 **Time : 3Hours**

General Instructions:

(i) **All questions are compulsory**

(ii) The question paper consists of 30 questions divided into four sections ***A, B, C and D.***

(iii) Section ***A*** contains **6** questions of **1** mark each. Section ***B*** contains **6** questions of **2** marks each. Section ***C*** contains ***10*** questions of ***3*** marks each. Section ***D*** contains ***8*** questions of ***4*** marks each.

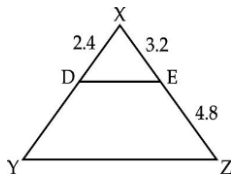
(iv) There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each and three questions of four marks each . You have to attempt only one of the alternatives in all such questions.

(v) Use of calculators is not permitted

Section A

Question numbers 1 to 6 carry 1 mark each.

1. Given that HCF (2520, 6600) = 40, LCM (2520, 6600) = 252 x *k*, then find the value of *k.*
2. Which constant must be added and subtracted to solve the quadratic equation $9x^2 + 3x - 8 = 0$ method of completing the square ?
3. Which term of the A.P : 92, 88, 84, 80, ... is 0 ?
4. If $P\left(\frac{a}{3}, 4\right)$ is the mid-point of the line segment joining the point Q(−6, 5) and R(−2, 3), then find the value of *a*
5. In the given figure, in ΔXYZ, DE ‖ YZ, so that the lengths of sides XD, XE and EZ (in centimeters) are 2.4, 3.2 and 4.8 respectively. Then the length of XY (in centimeters)



6. If $\sqrt{2}\sin(60-\alpha) = 1$, then find α

Section B

Question numbers 7 to 12 carry 2 marks each.

7. Show that 8^n cannot end with the digit zero for any natural number n.
8. Find the common difference of an A.P. whose first term is $\frac{1}{2}$ and the 8^{th} term is $\frac{17}{6}$. Also write its 4^{th} term
9. Solve the following system of linear equations by substitution method: $2x - y = 2$, $x + 3y = 15$
10. If C is the point lying on the line segment AB, joining the points A (1, 1) and B (2, −3) such that 3 AC = CB , find the co-ordinates of C.
11. A coin is tossed three times. Find the probability of getting exactly two tails
12. A bag has 7 red and 13 black balls. Another bag has 3 red and 17 white balls. The balls in the two bags are put in a basket and mixed thoroughly. A ball is picked at random from the basket. What is the chance that it is (i) white ball (ii) not a red ball

Section C

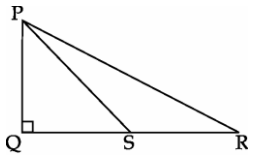
Question numbers 13 to 22 carry 3 marks each.

13. There are 156, 208 and 260 students in Groups A, B, C respectively. Buses are to be hired to take them for a field trip. Find the minimum number of buses to be hired if the same number of students should be accommodated in each bus.
14. Find the zeroes of the quadratic polynomial $6x^2 - 7x - 3$ and verify the relationship between the zeroes and the coefficients
15. A part of monthly expenses of a family is constant and the remaining varies with the price of rice. When the cost of rice is ₹250 per quintal, the monthly expenditure of the family is ₹ 1000 and when the cost of rice is ₹240 per quintal the monthly expenditure is ₹ 980. Find the monthly expenditure of the family when the cost of rice is ₹300 per quintal.
16. Find the ratio in which the line $2x + 3y = 10$ divides the line segment joining the points (1, 2) and (2, 3).

OR

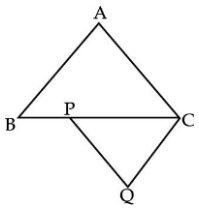
Prove that the points (a, 0), (0, b) and (1, 1) are collinear if $\frac{1}{a} + \frac{1}{b} = 1$

17. In the given figure, PQR is a right angled triangle in which $\angle Q = 90°$. If QS = SR, show that $PR^2 = 4PS^2 - 3PQ^2$



OR

In the given figure, $AB \parallel CQ$ and $AC \parallel PQ$. If $BP = \frac{1}{3}BC$, find the ratio of the areas of ΔABC and ΔQCP

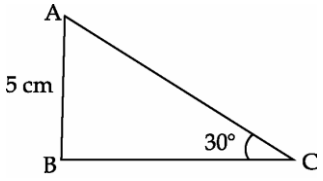


18. If A, B and C are interior angles of ΔABC, then show that :

$$\tan\left(\frac{\angle A + \angle B}{2}\right) = \cot\left(\frac{\angle C}{2}\right)$$

OR

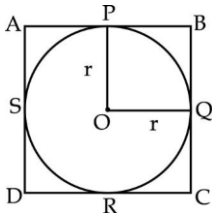
In figure below, ABC is a triangle right angled at B with AB = 5 cm, $\angle ACB = 30°$ Find the length of BC and AC.



19. If the mode of the data is 34.5, find the missing frequency '*f* ' :

Classes	0-15	15-30	30-45	45-60	60-75
Frequency	2	7	f	3	7

20. In the figure a circle is inscribed in a quadrilateral ABCD in which $\angle B = 90°$. If AD = 23 cm, AB = 29 cm and DS = 5 cm find the radius of the in circle

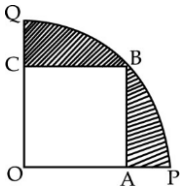


21. How many coins 1.75cm in diameter and 2mm thick must be melted to form a cuboid of dimensions 11cm x 10cm x 7cm ? ($Use\ \pi = \frac{22}{7}$)

OR

Water is flowing at 7m/s through a circular pipe of internal diameter of 2cm into a cylindrical tank, the radius of whose base is 40cm. Find the increase in water level in 30 minutes

22. In the given figure, a square OABC is inscribed in a quadrant OPBQ. If OA = 20 cm, find the area of shaded region. (Use $\pi = 3.14$).



Section D

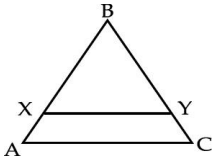
Question numbers 23 to 30 carry 4 marks each

23. The sum of two natural numbers is 8. Find the numbers if the sum of their reciprocals is 8/15.

OR

A motor boat, whose speed is 15km/h in still water, goes 30km down stream and comes back in a total of 4 hours and 30 minutes. Determine the speed of stream.

24. Twenty one glass spheres each of radius 2cm are packed in a cuboidal box of internal dimensions 16cm x 8cm x 8cm and then the box is filled with water. Find the volume of water filled in the box.
25. The sum of first six terms af an A.P is 42. The ratio of its 10th term to its 30^{th} term is 1:3. Calculate the first term and the thirteenth term of an. A.P
26. In the given figure, in ΔABC, XY ‖ AC and XY divides the ΔABC into two regions such that ar (ΔBXY) = 2ar(ACYX). Determine $\frac{AX}{AB}$



OR

Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides

27. Draw a line segment AB of length 7cm. Taking A as centre, draw a circle af radius 3cm and taking B as centre, draw another circle af radius 2.5cm. Construct tangents to each circle from the centre of the other circle.
28. If $x = a\cos\theta + b\sin\theta$ and $y = b\cos\theta - a\sin\theta$, then prove that $x^2 + y^2 = a^2 + b^2$
29. From the top of a tower the angle of depression of an object on the horizontal ground is found to be 60°. On descending 20 m vertically downwards from the top of the tower, the angle of depression of the object is found to be 30°. Find the height of the tower.
30. The following distribution gives the marks of students of a class

Marks	0-10	10-20	20-30	30-40	40-50	50-60
Nos. of students	7	10	23	51	6	3

Convert the above distribution into a less than type cumulative frequency distribution. Draw its ogive and find the median.

OR

Calculate the mean marks of the following data using the step deviation method

Classes	25-35	35-45	45-55	55-65	65-75
No. of students	6	10	8	12	4

************THE END***********