CBSE Board

Class X Mathematics

Sample Paper 5 (Standard)

Time: 3 hrs **Total Marks: 80**

General Instructions:

1. **All** questions are **compulsory**.
2. The question paper consists of **40** questions divided into **four sections** A, B, C, and D. **Section A** comprises of **20** questions of 1 mark each, **Section B** comprises of **6** questions of 2 marks each, **Section C** comprises of **8** questions of 3 marks each and **Section D** comprises of **6** questions of 4 marks each.
3. There is no overall choice. However, an internal choice has been provided in **two questions of 1 mark** each, **two questions of 2 marks** each, **three questions of 3 marks** each, and **three questions of 4 marks** each. You have to attempt only one of the alternatives in all such questions.
4. Use of calculator is **not** permitted.

Section A

(Q 1 to Q 10) are multiple choice questions.
Select the most appropriate answer from the given options

1. LCM of $(2^3 \times 3 \times 5)$ and $(2^4 \times 5 \times 7)$ is
   (a) 40
   (b) 560
   (c) 1120
   (d) 1680

2. Which of the following is not a measure of central tendency?
   (a) Mean
   (b) Mode
   (c) Median
   (d) Range

3. What is the largest number that divides each one of 1152 and 1664 exactly?
   (a) 32
   (b) 64
   (c) 128
   (d) 256

4. If $\frac{2x}{3}-\frac{y}{2}+\frac{1}{6}=0$ and $\frac{x}{2}+\frac{2y}{3}=3$ then

(a) x = 2, y = 3

(b) x = -2, y = 3

(c) x = 2, y = -3

(d) x = -2, y = -3

5. tan 5° tan 25° tan 30° tan 65° tan 85° = ?

(a) $\sqrt{3}$

(b) $\frac{1}{\sqrt{3}}$

(c) 1

(d) none of these

6. cos 1° cos 2° cos 3° ..... cos 180° = ?

(a) -1

(b) 1

(c) 0

(d) $\frac{1}{2}$

7. $\frac{2\sin^2 63^\circ+1+2\sin^2 27^\circ}{3\cos^2 17^\circ-2+3\cos^2 73^\circ}$

(a) $\frac{3}{2}$

(b) $\frac{2}{3}$

(c) 2

(d) 3

8. The distance of the point (-3, 4) from x-axis is

(a) 3

(b) -3

(c) 4

(d) 5

9. The point on x-axis which is equidistant from points A(-1, 0) and B(5, 0) is

(a) (0, 2)

(b) (2, 0)

(c) (3, 0)

(d) (0, 3)

10. If R(5, 6) is the midpoint of the line segment AB joining the points A(6, 5) and B(4, y) then y equals

(a) 5

(b) 7

(c) 12

(d) 6

(Q 11 to Q 15) Fill in the blanks

11. The area of a square field is 6050 m^2. The length of its diagonal is_____

12. If one zero of the quadratic polynomial $(k - 1)x^2 + kx + 1$ is –4, then the value of k is____

OR

If one zero of $3x^2 + 8x + k$ be the reciprocal of the other then k = ____

13. The shadow of a 5 m long stick is 2 m long. At the same time the length of the shadow of a 12.5 m high tree (in m) is_____

14. The sum of first n terms of an AP is $(3n^2 + 6n)$. The common difference of the AP is_____

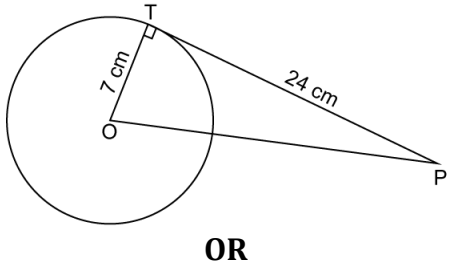
15. If the probability of occurrence of an event is p then the probability of non-happening of this event is_____

(Q 16 to Q 20) Answer the following

16. The HCF of two numbers is 27 and their LCM is 162. If one of the number is 81, find the other.

17. If $\Delta ABC \sim \Delta DEF$ such that 2AB = DE and BC = 6 cm, find EF.

18. In a circle of radius 7 cm, tangent PT is drawn from a point P such that PT = 24 cm. If O is the centre of the circle, then length OP is?



OR

The chord of a circle of radius 10 cm subtends a right angle at its centre. The length of the chord (in cm) is ?

19. Which term of the AP 21, 18, 15, ... is -81?

20. Solve : $x^2 + 12x + 35 = 0$

Section B
(Q 21 to Q 26 carry 2 marks each)

21. Find the HCF and LCM of 12, 15, 18, 27.

22. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segments joining the points of contact at the centre.

23. In a trapezium ABCD, it is given that AB ∥ CD and AB = 2CD. Its diagonals AC and BD intersect at the point O such that ar(ΔAOB)=84 cm^2. Find ar(ΔCOD).

OR

Two triangle ABC and PQR are such that AB =3 cm, AC =6 cm, ∠A =70^o, PR =9 cm, ∠P = 70^o and PQ = 4.5 cm. Show that ΔABC ~ ΔPQR and state the similarity criterion.

24. A ladder 15 m long just reaches the top of a vertical wall. If the ladder makes an angle of 60^o with the wall then find the height of the wall.

25. If the probability of winning a game is 0.7, what is the probability of losing it?

OR

There are 35 students in a class of whom 20 are boys and 15 are girls. From these students one is chosen at random. What is the probability that the chosen student is a (i) boy (ii) girl?

26. Find the number of solid spheres, each of diameter 6 cm that could be molded to form a solid metallic cylinder of height 45 cm and diameter 4 cm.

Section C
(Q 27 to Q 34 carry 3 marks each)

27. Explain why $3.\overline{1416}$ is a rational number.

OR

Prove that $\frac{2}{\sqrt{7}}$ is irrational.

28. A man arranges to pay off a debt of Rs. 36000 by 40 monthly installments which form an arithmetic series. When 30 of the installments are paid, he dies leaving one-third of the debt unpaid. Find the value of the first installment.

29. Solve : 23x+29y=98, 29x+23y=110

OR

Solve : 6x+3y=7xy and 3x+9y = 11xy

30. If two zeroes of the polynomial $p(x)=2x^4-3x^3-3x^2+6x-2$ are $\sqrt{2}$ and $-\sqrt{2}$, find its other two zeros.

31. Find the area of ΔABC with vertices A(0, -1), B(2, 1) and C(0, 3). Also, find the area of the triangle formed by joining the midpoints of its sides. Show that the ratio of the areas of two triangles is 4 :1.

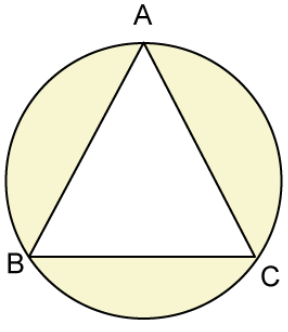
32. If ∠A and ∠B are acute angles such that tan A = tan B then prove that ∠A = ∠B

OR

Prove that $\frac{\tan A}{(1-\cot A)}+\frac{\cot A}{(1-\tan A)}=(1+\tan A+\cot A)$.

33. On a circular table cover of radius 42 cm, a design is formed by a girl leaving an equilateral triangle ABC in the middle, as shown in the figure. Find the covered area of the design.

$\left[\text{Use } \sqrt{3}=1.73 \text{ and } \pi=\frac{22}{7}\right]$



34. The arithmetic mean of the following frequency distribution is 25.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	16	p	30	32	14

Find the value of p.

Section D
(Q 35 to Q 40 carry 4 marks each)

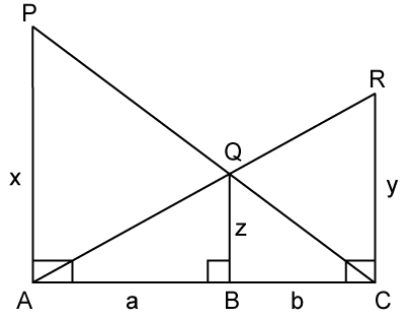
35. Construct a triangle with sides 5 cm, 6cm and 7 cm and then construct another triangle whose sides are 7/5 of the corresponding sides of the first triangle

OR

Construct a triangle ΔABC in which BC = 8 cm, ∠B = 45° and ∠C = 60°. Construct another triangle similar to ΔABC such that its sides are 3/5 of the corresponding sides of ΔABC

36. In the given figure, each one of PA, QB and RC is perpendicular to AC.

If $AP = x, QB = z, RC = y, AB = a$ and $BC = b$, show that $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$.



37. Two pipes running together can fill a tank in $11\frac{1}{9}$ minutes. If one pipe takes 5 minutes more than the other to fill the tank separately, find the time in which each pipe would fill the tank separately.

OR

A takes 10 days less than the time taken by B to finish a piece of work. If both A and B together can finish the work in 12 days, find the time taken by B to finish the work.

38. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank which is 10 m in diameter and 2 m deep. If the water flows through the pipe at the rate of 4 km/hr, in how much time will the tank be filled completely?

OR

An open metal bucket is in the shape of a frustum of a cone, mounted on a hollow cylindrical base made of the same metallic sheet. The diameters of the two circular ends of the bucket are 45 cm and 25 cm, the total vertical height of the bucket is 40 cm and that of the cylindrical base is 6 cm. Find the area of the metallic sheet used to make the bucket. Also, find the volume of water the bucket can hold, in litres.

39. An electrician has to repair an electric fault on a pole of height 4 metres. He needs to reach a point 1 metre below the top of the pole to undertake the repair work. What should be the length of the ladder that he should use, which when inclined at an angle of 60° to the horizontal would enable him to reach the required position? $\left[\text{Take } \sqrt{3} = 1.73\right]$

40. The following table gives the marks obtained by 50 students in a class test:

Marks	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50
Number of students	2	3	6	7	14	12	4	2

Calculate the mean, median and mode for the above data.