Sample Papers

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Sample Paper 1 (Unsolved)

(Standard Level)

Time: 3 hrs. **Max. Marks: 80**

General Instructions

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

Section-A

1. The greatest number which divides 230, 1314 and 1331 leaving remainder 5 in each case is:

a. 34 b. 55
c. 17 d. None of these

Or

Which of the following rational numbers has terminating decimal expansion?

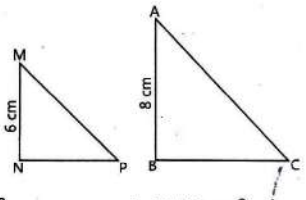
(i) $\frac{26}{225}$ (ii) $\frac{5}{8}$
(iii) $\frac{2}{21}$ (iv) $\frac{7}{250}$

a. (i) and (ii) b. (ii) and (iii)
c. (i) and (iii) d. (i) and (iv)

2. Find a quadratic polynomial, the sum and product of whose zeroes are $-\frac{1}{4}, \frac{1}{4}$.

a. $4x^2 - x + 1$ b. $4x^2 + x - 1$
c. $4x^2 + x + 1$ d. None of these

3. In the given figure, $\Delta MNP \sim \Delta ABC$ such that MN = 6 cm, AB = 8 cm and area of ΔMNP is 15 cm^2, then the area of ΔABC is:



a. 26.66 cm^2 b. 16.66 cm^2
c. 20 cm^2 d. None of these

4. A vertical straight tree, 15 m high, is broken by the wind in such a way that its top just touches the ground and makes an angle of 60° with the ground. At what height from the ground did the tree break?

a. 6.9 m b. 9.6 m
c. 5.9 m d. 7.9 m

5. In the formula,

$\bar{X} = A + \frac{\Sigma f_i d_i}{\Sigma f_i}$ for finding the mean of grouped data,

d_i's are deviations from A of:

a. lower limits of the classes
b. upper limits of the classes
c. mid-points of the classes
d. frequencies of the class marks

Or

Consider the following distribution:

Marks obtained	Number of students
More than or equal to 0	63
More than or equal to 10	58
More than or equal to 20	55
More than or equal to 30	51
More than or equal to 40	48
More than or equal to 50	42

The frequency of the class 30–40 is:

a. 3 b. 4 c. 48 d. 51

6. The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ has ..... solution.

Or

If $x = a$ and $y = b$ is the solution of the equations $x - y = 2$ and $x + y = 4$, then the values of a and b are respectively ..... .

7. The area of an equilateral triangle described on one side of the square is equal to ..... the area of the equilateral triangle described on one of its diagonal.

8. A tangent PQ at a point P to a circle of radius 5 cm meets a line through the centre O at a point Q, so that OQ = 13 cm, then length of PQ is ..... .

9. The area of the circle that can be inscribed in a square of side 6 cm is ..... .

Or

The area of a road which is 7 m wide and that surrounds a circular park whose circumference is 352 m is ..... .

10. If an integer is chosen at random from the first two hundred digits, the probability that the integer chosen is divisible by 6 or 8 is ..... .

Or

The outcomes which ensure the occurrence of an event are called ..... outcomes.

11. If the 3rd and the 9th terms of an AP are 4 and −8 respectively, then 5th term of this AP is 0. (T/F)

12. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 80°, then ∠POA is equal to 70°. (T/F)

13. To construct a triangle similar to a given triangle as per the given scale factor, it must be equal to 1. (T/F)

14. If $\cos(a+b)=0$, then $\sin(a-b)$ can be reduced to $\sin 2a$. (T/F)

15. Find the perimeter (in cm) of a square circumscribing a circle of radius a cm.

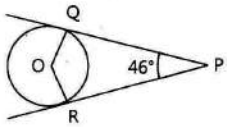
16. If $x = 3$ is one root of the quadratic equation $x^2 - 2kx - 6 = 0$, then find the value of k.

17. Find the distance of the point P (−3, 4) from the X-axis.

Or

Find the distance between the points (a, b) and $(-a, -b)$.

18. In the adjoining figure, PQ and PR are two tangents to a circle with centre O. If ∠QPR = 46°, then calculate ∠QOR.



19. Evaluate $10 \cdot \dfrac{1-\cot^2 45°}{1+\sin^2 90°}$.

Or

Find the value of $\cos 48° - \sin 42°$.

20. A ball is exactly fit inside the cubical box of side 'a' unit. What is the volume of the ball?

Section-B

21. Using Euclid's division algorithm, check whether the pair of numbers 50 and 20 are co-prime or not.

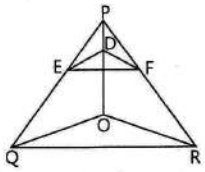
22. Find c if the system of equations $cx + 3y + (3 - c) = 0$, $12x + cy - c = 0$ has infinitely many solutions?

Or

Find the value of k for which the following pair of linear equations have infinitely many solutions,
$2x + 3y = 7$, $(k+1)x + (2k-1)y = 4k + 1$.

23. The x-coordinate of a point P is twice its y-coordinate. If P is equidistant from Q (2, −5) and R (−3, 6), find the coordinate of P.

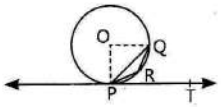
24. In the following figure, DE || OQ and DF || OR, show that EF || QR.



25. The incircle of an isosceles triangle ABC, in which AB = AC, touches the sides BC, CA and AB at D, E and F respectively. Prove that BD = DC.

Or

In the adjoining figure, PQ is a chord of a circle with centre O and PT is a tangent. If ∠QPT = 60°, find ∠PRQ.



26. If $\tan(A+B) = \sqrt{3}$ and $\tan(A-B) = \dfrac{1}{\sqrt{3}}$; $0° < A + B \le 90°$, $A > B$, then find A and B.

Section-C

27. Show that cube of any positive integer is of the form $4m$, $4m + 1$ or $4m + 3$ for some integer m.

Or

By using Euclid's algorithm, find the largest number which divides 650 and 1170.

28. On dividing $x^3 - 3x^2 + x + 2$ by a polynomial $g(x)$, the quotient and remainder were $x - 2$ and $-2x + 4$ respectively. Find $g(x)$.

29. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.

Or

The sum of the squares of two consecutive odd numbers is 394. Find the numbers.

30. If A(− 5, 7), B(− 4, − 5), C(−1, − 6) and D(4, 5) are the vertices of a quadrilateral, find the area of the quadrilateral ABCD.

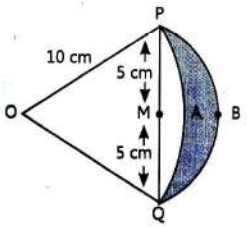
31. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle 30° with it. The distance between the foot of the tree to the point where the top touches the ground is 8 m. Find the height of the tree.

Or

The angles of depression of the top and bottom of a 50 m high building from the top of a tower are 45° and 60° respectively. Find the height of the tower and the horizontal distance between the tower and the building.(Use $\sqrt{3} = 1.732$)

32. In the adjoining figure, are shown two arcs PAQ and PBQ. Arc PAQ is a part of circle with centre O and radius OP while arc PBQ is a semicircle drawn on PQ as diameter with centre M.

If OP = PQ = 10 cm, show that area of shaded region is $25\left(\sqrt{3} - \frac{\pi}{6}\right)\text{cm}^2$.



33. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, determine the number of blue balls in the bag.

34. Three unbiased coins are tossed simultaneously. Find the probability of getting:

(i) exactly 2 heads, (ii) at least 2 heads,

(iii) at most 2 heads.

Section-D

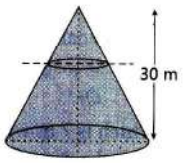
35. Draw the graphs of the equations $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Determine the coordinates of the vertices of the triangle formed by these lines and the X-axis, and shade the triangular region. Also calculate the area bounded by these lines and X-axis.

36. If the sum of first four terms of an AP is 40 and that of first 14 terms is 280. Find the sum of its first n terms.[4]

Or

Find the 60th term of the AP 8, 10, 12, ... if it has a total of 60 terms and hence find the sum of its last 10 terms.

37. A right circular cone of height 30 cm is drawn. A small cone is cut off from the top by a plane parallel to the base. If the volume of the small cone is $\frac{1}{27}$ of the volume of given cone, find at what height above the base is the section made?



38. Draw a triangle ABC with BC = 6 cm, AB = 5 cm and $\angle ABC = 60°$. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the Δ ABC.

39. If $x = r\sin A \cdot \cos C$, $y = r\sin A \cdot \sin C$ and $z = r\cos A$, then prove that $x^2 + y^2 + z^2 = r^2$.

40. The marks obtained by 100 students of a class in an examination are given below:

Marks	No. of students
0–5	2
5–10	5
10–15	6
15–20	8
20–25	10
25–30	25
30–35	20
35–40	18
40–45	4
45–50	2

Draw 'a less than' type cumulative frequency curves (ogive). Hence find median.

Or

Draw a 'more than ogive' for the following distribution and hence find its median.

Class	Frequency
20–30	25
30–40	15
40–50	10
50–60	6
60–70	24
70–80	12
80–90	8

Answer Key

Sample Paper-1

1. (d) **OR** (d) **2.** (c) **3.** (a) **4.** (a) **5.** (c) **OR** (a) **6.** no **OR** 3 and 1 **7.** half **8.** 12 cm **9.** 9π cm^2 **OR** 2618 m^2 **10.** $\frac{1}{4}$ **OR** favourable **11.** True **12.** False **13.** False **14.** False **15.** 8a cm **16.** $\frac{1}{2}$

17. 4 units **18.** $2\sqrt{a^2+b^2}$ units **19.** 0 **OR** 0 **20.** $\frac{\pi a^3}{6}$ cubic units. **21.** not co-prime **22.** $c = 6$ **OR** $k = 5$

23. (16, 8) **25. OR** 120° **26.** $\angle A = 45°$ and $\angle B = 15°$ **27. OR** 130 **28.** $g(x) = x^2 - x + 1$ **29.** 12 cm (+ve side) **OR** $-15 - 13$ **30.** 72 sq. units **31.** $8\sqrt{3}$ m **OR** 118.29 m and 68.30 m **33.** 10 blue balls **34.** (i) $\frac{3}{8}$ (ii) $\frac{1}{2}$ (iii) $\frac{7}{8}$

35. 7.5 sq. units **36.** $6n + n^2$ **OR** 1170 **37.** 20 cm **40.** 29.6 **OR** 50