MODEL PAPER_CBSE-X’20

According to the Syllabus & Guide Lines for CBSE’20

CLASS-X (2019-2020)

QUESTION WISE BREAK UP

Type of Question	Mark per Question	Total No. of Questions	Total Marks
VSA	1	20	20
SA	2	06	12
LA-I	3	08	24
LA-II	6	04	24
Total		36	80

Blueprint of S Q P-02 for CBSE Cl-X'20		80
Q. No.	Name of Chapter	Marks
1	Real Numbers	1
2	Arithmetic Progressions	1
3	Coordinate Geometry (Lines)	1
4	Surface Areas and Volumes	1
5	Pair of Linear Equations in Two Variables	1
OR 5	Pair of Linear Equations in Two Variables	
6	Polynomials	1
7	Circles	1
8	Polynomials	1
9	Introduction to Trigonometry	1
10	Coordinate Geometry (Lines)	1
11	Real Numbers	1
12	Probability	1
13	Introduction to Trigonometry	1
14	Coordinate Geometry (Lines)	1
15	Triangles	1
16	Some Applications of Trigonometry	1
OR 16	Introduction to Trigonometry	
17	Real Numbers	1
18	Probability	1
19	Triangles	1
20	Statistics	1
21	Polynomials	2
22	Probability	2
OR 22	Probability	
23	Circles	2
24	Some Applications of Trigonometry	2
OR 24	Introduction to Trigonometry	
25	Area Related to Circles	2
26	Probability	2
27	Polynomials	3
28	Constructions	3
OR 28	Constructions	
29	Surface Areas and Volumes	3
30	Introduction to Trigonometry	3
OR 30	Introduction to Trigonometry	
31	Real Numbers	3
OR 31	Real Numbers	
32	Circles	3
33	Coordinate Geometry (Lines)	3
34	Pair of Linear Equations in Two Variables	3
35	Quadratic Equations	4
36	Arithmetic Progressions	4
OR 36	Arithmetic Progressions	
37	Triangles	4
38	Some Applications of Trigonometry	4
OR 38	Some Applications of Trigonometry	
39	Surface Areas and Volumes	4
OR 39	Surface Areas and Volumes	
40	Statistics	4

Do not write anything this side	Actual	Expected
Real Numbers	6	6
Polynomials	7	20
Pair of Linear Equations in Two Variables	4	
Quadratic Equations	4	
Arithmetic Progressions	5	
Coordinate Geometry (Lines)	6	6
Triangles	6	15
Circles	6	
Constructions	3	
Introduction to Trigonometry	5	12
Some Applications of Trigonometry	7	
Area Related to Circles	2	10
Surface Areas and Volumes	8	
Statistics	5	11
Probability	6	

[Mp 02F Cbse X'20 Q 191221] MODEL TEST [Pre CBSE-X'20] [FM–80/Time–3 hrs.]

GENERAL INSTRUCTIONS:

(i) **All** questions are compulsory.
(ii) This question paper contains **40** questions divided into four sections A, B, C & D.
(iii) Question **1- 20** in **Section A** are very short-answer type questions carrying **1** mark each.
(iv) Question **21-26** in **Section B** are short-answer type questions carrying **2** marks each.
(v) Question **27-34** in **Section C** are long-answer-**I** type questions carrying **3** marks each.
(vi) Question **35-40** in **Section D** are long-answer-**II** type questions carrying **4** marks each.
(vii) There is no overall choice. However internal choices have 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.
(viii) Use of calculators is not permitted.

SECTIONS – A (Questions 01 to 20 carry 1 marks each)

1. The ratio of two numbers is 7 : 5. HCF of the numbers is 17. The numbers are :
i) 85 : 30 ii) 204, 85 iii) 119, 30 iv) 119, 85

2. Find the value of 'a', so that, a + 9, 2a – 1 and 2a + 7 are the consecutive terms of an A.P.
i) 6 ii) 18 iii) $\frac{18}{7}$ iv) 12

3. The equation of the straight line, which is perpendicular bisector of the line segment joining the points A(– 1, 3) and B(5, 3) is
i) $y = 2$ ii) $x = 3$ iii) $x = 2$ iv) $y = 3$

4. A cylinder, a cone and a hemisphere are of equal base and have the same height. What is the ratio in their volumes?
i) 1: 1: 2 ii) 1 : 2 : 3 iii) 3 : 1 : 2 iv) 3 : 2 : 2

5. Which of the following pair of linear equations have no solution ?
i) $3x + 2y = 5,\ x - 3y = 3$ ii) $3x - 2y = 7,\ 9x - 6y = 22$
iii) $2x - 4y = 7,\ 6x - 12y = 21$ iv) $11x + 3y = -16,\ 2x + y = 7$

OR, The value of 'p' for which the pair of linear equations $2x + 3y = 7$ and $(k - 1)x + (k+2)y = 3k$ have infinitely many solutions is
i) $\frac{7}{2}$ ii) 7 iii) $\frac{7}{6}$ iv) – 7

6. If sum and product of the zeroes of a quadratic polynomial are (– 5) and (– 14), then the polynomial is
i) $x^2 - 5x - 14$ i) $x^2 + 9x - 14$ iii) $x^2 + 5x - 14$ or iv) $x^2 - 9x - 14$

7. AB and DC are respectively a diameter and a chord of a circle. Given that lengths of AB and DC are10 units and 6 units respectively. If DC||AB, then distance between AB and DC is
i) 4 units ii) 8 units iii) 5 units iv) 6 units

8. The sum of the zeroes of the quadratic polynomial $x^2 - 5x - 14$ is
i) 3 ii) – 3 iii) 4 iv) – 4

9. If ΔABC is an isosceles right angled at A, then the value of secB is
i) $\sqrt{3}$ ii) $\frac{1}{\sqrt{2}}$ iii) $\sqrt{2}$ iv) $\frac{1}{\sqrt{3}}$

10. A(1, 5) and B(7, 5) are two vertices of an equilateral ΔABC. Then coordinates of C is
i) $(4, 3\sqrt{3})$ ii) $(4, 8)$ iii) $(5, 5+3\sqrt{3})$ iv) $(4, 5+3\sqrt{3})$

11. Which of the following is decimal expansion of an irrational number ?
i) 3.452 ii) $\overline{0.13}$ iii) 4.030030003… iv) 5.07

12. An integer is chosen at random from 1 to 1000. Find the probability that the number is a perfect cube.

13. If $\cot A = \frac{1}{\sqrt{7}}$, then find the value of $\frac{\operatorname{cosec}^2 A - \sec^2 A}{\operatorname{cosec}^2 A + \sec^2 A}$.

14. A(2, 1), and B(–2,1) are the two vertices of an equilateral ΔABC. If C does not lie in 1st quadrant, then find coordinates of point C.

15. In fig-1, DE is parallel to BC and AD = 4 cm, BD = 1 cm.
Find : area(ΔABC) : area(ΔADE).

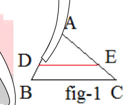


fig-1

16. From the top of a post, the angle of elevation of a telephone tower is 45°. If the height of the post and the distance between the feet of post and tower are 10 m and 30 m, then find the height of the tower.

OR If $\sqrt{2}\cos A - \sin A = \cos A$ $(0^{\circ} < A < 90^{\circ}$, then write the value of cotA.

17. Write a rational number between $\frac{3}{5}$ and $\frac{5}{7}$

18. A die is thrown once. What is the probability of getting a composite number.

19. If $x^2 + y^2 + z^2 - xy - yz - zx = 0$, where x, y and z are the lengths of sides of a triangle, then the triangle is :
i) scalene ii) isosceles iii) equilateral iv) right-angled

20. Write the relation between Mean, Mode and Median.

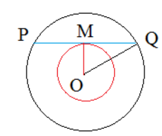
<u>SECTIONS</u> – B (Questions 21 to 26 carry 2 marks each.)

21. If $\left(x^2 + ax + b\right)$ is a perfect square, then write the relation between **a** and **b**.

22. A die is thrown twice. What is the probability of getting the lowest prime number as sum of the digits on upper faces of two throw.

OR, What is the probability of taking a vowel from the letters of the word 'daughter'.

23. In adjacent figure, two concentric circles with centre at O and having radii 5 cm and 3 cm. A chord PQ of the bigger circle touches the smaller circle at M.
Find the length of chord PQ.



24. An aeroplane when 3000 m high from ground, passes vertically above another aeroplane at an instant, when the angles of elevation of the two aeroplanes from the point, on the ground are 60° and 45° respectively. Find the vertical distance between the aeroplanes.

OR, Given , $\sin(A-B) = \frac{1}{2} = \cos(A+B)$, where $0 < (A+B) < 90^{\circ}$ and $A > B$.
Find angles A and B.

25. In fig-2, ΔABC is a right–angled, right angle at B and AB = 3 cm, BC = 4 cm.
Semicircles are drawn on AC, AB and BC as diameters. Find area of the shaded region.

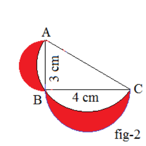


fig-2

26. A ticket is drawn at random from a bag containing tickets numbered from 1 to 50. Find the probability that the selected ticket has a number which is a multiple of 7.

<u>SECTIONS</u> – C (Questions 27 to 32 carry 3 marks each.)

27. If the sum of the squares of zeros of polynomial $\left(6x^2+x+k\right)$ is $\frac{25}{36}$, then find ‘k’.

28. Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm and measure its length.

OR, Draw a right angled triangle ABC with BC = 7cm, $\angle B=45^o$ and $\angle A=90^o$. Then construct a triangle whose sides are $\frac{2}{3}$ times the corresponding sides of ΔABC.

29. A hemispherical tank, of diameter 3m. is full of water. It is being emptied by a pipe at the rate of $3\frac{4}{7}$ litres per second. How much time will it take to make the tank three-fourth empty ? $\left[\pi=\frac{22}{7}\right]$

30. Prove that, $\left(1+\frac{1}{\tan^2 A}\right)\left(1+\frac{1}{\cot^2 A}\right)=\frac{1}{\sin^2 A-\sin^4 A}$.

OR, Prove that: $\frac{1}{\cos^2 A}-\frac{\sin^2 A-\sin^4 A}{2\cos^4 A-\cos^2 A}=1$

31. Show that $2+\sqrt{3}$ is irrational.

OR, Show that the square of any positive odd integer is of the form (8m+1), for some integer m.

32. ABCD is a quadrilateral, whose sides are AB = 6 cm, BC = 9 cm, CD = 8 cm and DA = ‘a’ cm. A circle touches the sides of ABCD. Find ‘a’. [see fig-3]

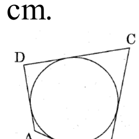


fig-3

<u>SECTIONS</u> – D (Questions 33 to 36 carry 4 marks each)

33. A(4, 6); B(6, 2); C(8, 10) are the vertices of ΔABC. D, E, F are the mid-points of the AB, BC and CA respectively. Find area(ΔDEF) : area(ΔABC).

34. Given $(x+y-3)^2+(3x+y+1)^2=0$ [x and y are real numbers]. Solve for x and y.

35. Solve for ‘x’ : $\frac{1}{(x-1)(x-2)}+\frac{1}{(x-2)(x-3)}+\frac{1}{(x-3)(x-4)}=\frac{1}{6}$.

36. Given 9^{th} term of an A.P. is zero. Prove that its 29^{th} term is double of its 19^{th} term.

OR, The n^{th} term and the sum of first n terms of an A.P are respectively are T_n and S_n and $\frac{S_m}{S_n}=\frac{m^2}{n^2}$.

Prove that, $\frac{T_m}{T_n}=\frac{2m-1}{2n-1}$.

37. In ΔABC, $\angle ABC > 90^o$ (see the adjacent figure). CD is perpendicular to AB produced. Prove that, $AC^2+AB^2+BC^2+2BC.BD$.

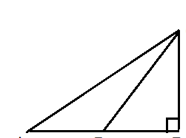


fig-4

38. From the top of a building 60 m. high, the angles of depression of the top and bottom of a lamppost are observed to be 30^o and 60^o respectively. Find the distance between the lamppost and building. Also find the difference of height between building and lamppost.

OR, The angle of elevation of the top of a telephone tower from the foot of a building is 60^o and the angle of elevation of the top of the building from the foot of the tower is 30^o. If the building is 50m high, find the height of the telephone tower.

39. In fig-5, PM = 21 cm, MO = 30 cm and QM = 7 cm. Find the volume of the figure.

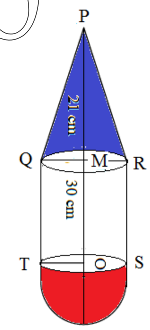


fig-5

OR, A bucket is in the form of a frustum of a cone with a capacity of 12308.8 cm^3. The radii of the top and bottom circular ends of the bucket are 20 cm and 12 cm respectively. Find the height of the bucket and also the area of metal sheet used in making it. $[\pi = 3.14]$

40. Find the mean, mode and median for the following data :

Class interval	Frequency
$25-35$	7
$35-45$	31
$45-55$	33
$55-65$	17
$65-75$	11
$75-85$	1
Total	60

"The Algebra is but a Geometry in writing,
the Geometry is but an Algebra enfigured." – Sophie Germain.

Paper by :
SAMIR KUMAR BASU
Basu-Niketan, Bonmasjid Para,
Burdwan, West Bengal, India
Pin- 713101
e-mail: help@confinmath360.com
e-mail:confinmath360@gmail.com
Website: www.confinmath360.com
Blog : robinmath.blogspot.in