ST. XAVIER'S SENIOR SECONDARY SCHOOL, DELHI - 110 054
Annual Examination in **MATHEMATICS**

Std. 9 Time : 3 hrs.
23-2-2018 Max. Marks : 80

General Instructions:
i) Attempt all the questions.
ii) The question paper consists of 30 questions divided into four sections A, B, C and D. Section A comprises of 6 sections of 1 mark each, section B comprises of 6 questions of 2 marks each, section C comprises of 10 questions of 3 marks each and section D comprises of 8 questions of 4 marks each.

SECTION – A (1 x 6 = 6 marks)

1. Express $0.\overline{32}$ in the $\frac{p}{q}$ form.

2. Find the remainder when $x^3 - 6x^2 + 9x + 3$ is divided by (x – 1).

3. A dice is rolled number of times and its outcome is recorded as below. Find the probability of getting odd number.

OUTCOMES	1	2	3	4	5	6
FREQUENCY	35	45	50	38	53	29

4. Write the co-ordinates of a point on Y axis whose ordinate is – 2.

5. A square paper of side 12 cm is rolled into the form of a cylinder. Find the Curved Surface Area.

6. In a right angled isosceles triangle ABC right angled at A, find the value of ∠B.

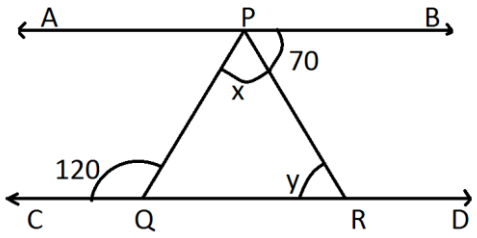
SECTION – B (2 x 6 = 12 marks)

7. Write 2 solutions for the equation x + 2y = 8.

8. In the figure, AB II CD,

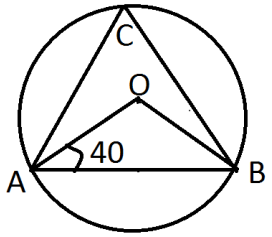
∠BPR = 70^0, ∠PQC =120^0,

find x and y.



9. In the figure, O is the centre of the circle and

if ∠OAB = 40^0, find ∠ACB.



10. Two angles of a quadrilateral are 50^0 and 80^0 and other angles are in the ratio 8:15. Find the remaining angles.

11. Three coins are tossed simultaneously 150 times with the following frequencies of different outcomes.

NUMBER OF TAILS	0	1	2	3
FREQUENCY	25	30	32	63

Compute the probability of getting
a) At least 2 tails b) Exactly one tail.

12. The diameter of a sphere is 42 cm. It is melted and drawn into a cylindrical wire of diameter 28 cm. Find the length of the wire.

SECTION – C

13. Simplify $\frac{4+\sqrt{5}}{4-\sqrt{5}} + \frac{4-\sqrt{5}}{4+\sqrt{5}}$.

14. Verify $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x+y+z)[(x-y)^2 + (y-z)^2 + (z-x)^2]$

15. Find the value of a and b if the line 5bx – 3ay = 30 passes through (-1, 0) and (0, -3)

(OR)

Solve the following equation 24 – 3 (x – 2) = x + 18 and represent it as an **equation** in
a) one variable b) two variables.

16. Write the axis or quadrant to which the following points belong.
A (5, 0), B(0, 3), C(7, 2), D(-4, 3), E(-3, -2), F(3, -2)

17. Prove that parallelograms on the same base and between the same parallels are equal in area.

18. AD is an altitude of an isosceles triangle ABC in which AB = AC. Show that
a) AD bisects BC b) AD bisects $\angle$A.

19. Prove that the angle subtended by an arc at centre is double the angle subtended by it at any point on the remaining part of the circle.

(OR)

State and prove A.S.A congruency rule.

20. For a particular year, the following is the frequency distribution table of ages in years of primary teachers in a district.

Age (in years)	No. of teachers
15 – 20	10
20 – 25	30
25 – 30	50
30 – 35	50
35 – 40	30
40 – 45	6
45 – 50	4

a) Determine the class limits of the fourth class interval.
b) Find the class mark of the last class interval.
c) Determine the class size of classes of this frequency distribution table.

21. Two parallel sides of a trapezium are 120 cm and 154 cm and other sides are 50 cm and 52 cm. Find the area of the trapezium.

(OR)

The perimeter of a triangular field is 300 m. The sides are in the ratio 5:12:13. Find the length of perpendicular from opposite vertex to the side 130 m.

22. Water is flowing at the rate of 3 km/hr through a cylindrical pipe of 20 cm internal diameter, into a cylindrical tank of diameter 10m and depth 2 m. In how much time will the tank be filled?

(OR)

A conical tent has base area of 154 m^2 and its CSA is 550 m^2. Find the volume of the tent.

SECTION – D

23. Represent $\sqrt{9.4}$ geometrically.

24. Factorise $x^3 - 23x^2 + 142x - 120$ using factor theorem.

(OR)

Prove that $(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2) = 8y^3$

25. The taxi fare in a city is charged Rs. 10 for the first kilometre and Rs. 4 for the subsequent kilometers travelled. Find a linear equation to express the above Statement. Draw the graph of the linear equation. Take total fare as 'y' and distance travelled as 'x'.

26. The data about the ages in years of 50 teachers in a school is given below:

AGE	20 – 25	25 – 30	30 – 35	35 – 40	40 – 45	45 – 50	50 – 55
NO. OF TEACHERS	6	10	8	10	4	2	10

Draw a histogram and a frequency polygon to represent it.

27. If two equal chords of a circle intersect within the circle, prove that the segments of one chord are equal to the corresponding segments of the other chord.

28. Construct triangle PQR in which $\angle P = 90^0$, $\angle R = 60^0$ and the perimeter of the triangle is 12 cm.

(OR)

Construct triangle PQR in which QR = 6 cm, $\angle Q = 60^0$, PR – PQ = 3 cm.

29. Prove that the line segment joining the mid points of opposite sides of a quadrilateral bisect each other.

(OR)

Show that the diagonals of a parallelogram divide it into 4 triangles of equal area.

30. The pillars of a temple are cylindrical in shape. If each pillar has base radius 25 cm and height 10.5 cm, then find the quantity of concrete mixture used to build 32 such pillars. Also find the cost of concrete mixture at the rate of Rs. 250 / m^3. ($\pi = \frac{22}{7}$)

-x-x-x-x-x-x-x-