

**KENDRIYA VIDYALAYA B.S.F., POKARAN**  
**2<sup>nd</sup> PRE-BOARD EXAM. 2009-10**  
**CLASS- X**  
**SUBJECT- MATHEMATICS**

Time: 3 Hours

M.M. 100

**General Instructions:-**

- ❖ All questions are compulsory
- ❖ The question paper consists of 30 questions divided into 4 sections A,B,C, and D. Section A comprises of 10 questions of one mark each, Section B comprises of 5 questions of two marks each and Section C comprises of 10 questions of three marks each and Section D comprises of 5 questions of six marks each.
- ❖ All questions in section A are to be answered in one word, one sentence or as per the exact requirement of the question.
- ❖ There is no overall choice. However, internal choice has been provided in one question of 2 marks each, three questions of 3 marks each and two questions of 6 marks each. You have to attempt only one of the alternatives in all such questions.
- ❖ In questions of construction, drawing should be neat and exactly as per the given measurements.
- ❖ Use of calculators is not permitted. However you may ask for mathematics table.
- ❖

**SECTION- A**

- Q-1. Write the condition to be satisfied by  $q$  so that a rational number  $\frac{P}{q}$  has a terminating decimal expansion.
- Q-2. If the product of zeroes of the quadratic polynomial  $p(x)=(K-2)x^2 - 4x + K$  is 3, find the value of  $K$ .
- Q-3. Find the value of  $K$  for which the quadratic equation  $x^2 - Kx + 9 = 0$  has equal roots.
- Q-4. Find the value of  $x$  for which  $x + 2, 2x, 2x + 3$  are three consecutive terms of A.P.
- Q-5. Find the value of  $\frac{5}{\cot^2 \theta} - \frac{5}{\cos^2 \theta}$
- Q-6. The length of tangent from a point A at a distance of 5 cm from the centre of the circle is 4 cm. What will be the radius of the circle?
- Q-7. Which measure of central tendency is given by the x-coordinate of the point of intersection of the 'more than' ogive and 'less than ogive'?
- Q-8. The length of a minor arc is  $\frac{2}{9}$  of the circumference of the circle. Write the measure of the angle subtended by the arc at the centre of the circle.

- Q-9. Two friends were born in the year 2000. What is the probability that they have the same birthday?
- Q-10. The perimeter of two similar triangles ABC and LMN are 60 cm and 48 cm respectively. If LM=8cm, then what is the length of AB?

### SECTION B

- Q-11. Without drawing the graph, state whether the following pair of linear equations will represent intersecting lines, coincident lines or parallel lines:  
 $6x - 3y + 10 = 0$   
 $2x - y + 9 = 0$
- Q-12. One card is drawn from a well shuffled deck of 52 playing cards. Find the probability of getting a black king or a red queen.
- Q-13. Find the value of  $\tan 60^\circ$  geometrically

OR

If A, B, C are the interior angles of a  $\Delta ABC$  then show that  $\cos \frac{(B+C)}{2} = \sin \frac{A}{2}$

- Q-14. If the point A (4, 3) and B(x, 5) are on the circle with the centre O (2, 3), find the value of x
- Q-15. If the 10<sup>th</sup> term of an A.P. is 47 and its first term is 2, find the sum of its first 15 terms.

### SECTION -C

- Q-16. Solve the following system of linear equations graphically-  
 $3x + y - 12 = 0$   
 $x - 3y + 6 = 0$
- Q-17. Using Euclid's division algorithm, find the HCF of 56, 96 and 404
- Q-18. If two zeroes of the polynomial  $x^4 + 3x^3 - 20x^2 - 6x + 36$  are  $\sqrt{2}$  and  $-\sqrt{2}$ , find the other zeroes of the polynomial.
- Q-19. The first and the last term of an A.P. are 4 and 81 respectively. If the common difference is 7, how many terms are there in the A.P., and what is their sum?

Q-20. Solve for x and y

$$\frac{5}{x} + \frac{1}{y} = 2$$

$$\frac{6}{X} - \frac{3}{Y} = 1 \quad : x \neq 0, y \neq 0$$

OR

Find the roots of the equation:  $\frac{1}{X} - \frac{1}{x-3} = \frac{4}{3}$   $x \neq 0, 3$

Q-21. Prove that  $\sqrt{\frac{\sec \theta - 1}{\sec \theta + 1}} + \sqrt{\frac{\sec \theta + 1}{\sec \theta - 1}} = 2 \operatorname{cosec} \theta$

OR

Evaluate

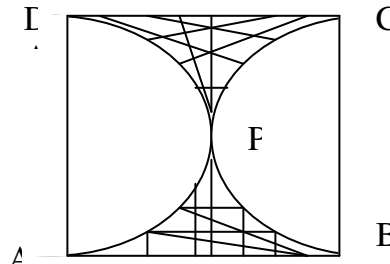
$$\frac{2}{3} \operatorname{Cosec}^2 58^\circ - \frac{2}{3} \cot 58^\circ \tan 32^\circ - \frac{5}{3} \tan 13^\circ \tan 37^\circ \tan 45^\circ \tan 53^\circ \tan 77^\circ$$

Q-22 Find the value of K, for which the points (8, 1), (K,-4) and (2,-5) are collinear

Q-23 Find the ratio in which the line segment joining the points (-3, 10) and (6,-8) is divided by (-1, 6)

Q-24 Construct a  $\Delta ABC$  in which  $CA = 6$  cm,  $AB=5$ cm and  $\angle BAC = 45^\circ$ , then construct a triangle similar to the given triangle whose sides are  $\frac{6}{5}$  of the corresponding sides of the triangle ABC.

Q-25. Find the area of the shaded region in figure if ABCD is a square of side 14cm and APD and BPC are semicircles.



OR

A metallic sphere of radius 4.2cm is melted and recast into the shape of a cylinder of radius 6cm. Find the height of the cylinder.

### SECTION- D

- Q-26. Some students arranged a picnic. The budget for food was Rs. 240. Because four students of the group failed to go, the cost of food to each student got increased by Rs. 5. How many students went for the picnic?

OR

Two water taps together can fill a tank in  $9\frac{3}{8}$  hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

- Q-27. Prove that in a right angled triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.  
Using the above theorem, find the value of the altitude of an equilateral triangle of side  $2a$ .
- Q-28. At a point on level ground, the angle of elevation of a vertical tower is found to be such that its tangent is  $\frac{5}{12}$ . On walking 192m towards the tower, the tangent of the angle of elevation is  $\frac{3}{4}$ . Find the height of tower.

OR

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

- Q-29. A container opened from the top and made up of a metal sheet, is in the form of a frustum of a cone of height 16cm with radii of its lower and upper ends as 8cm and 20 cm respectively. Find the cost of the milk which can completely fill the container at the rate of Rs. 20 per liter.
- Q-30. The distribution below gives the weights of 30 students of a class. Find the mode and the median weight of the students:-

Weight (in kg.)	Number of students
40-45	2
45-50	3
50-55	8
55-60	6
60-65	6
65-70	3
70-75	2

**MARKING SCHEME**  
**2<sup>ND</sup> Pre-Board Exam 2009-10**  
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M.M:-80

Q3.  $D=0$  (1/2),  $K= \pm 6$  (1/2)

Q6. Pythagoras Theorem (1/2), Radius= 3 cm (1/2)

Q.8 Angle at centre  $=80^{\circ}$  (1)

Q9.  $1/366$  (1)

Q10.  $\frac{AB}{LM} = \frac{\text{Perimeter of } \triangle ABC}{\text{Perimeter of } \triangle LMN}$   $AB=10$  cm (1)

Q11. Parallel lines (1),  $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$  (1)

Q12. Favorable outcomes (1/2), Formula (1/2)  
 $\frac{\text{Required Probability}}{52} = \frac{4}{13}$  (1)

Q13. Diagram (1), Calculation (1)

OR

$A+B+C=180^{\circ}$  (1/2)

Further calculation (1/2)

Q14. Mid-Point formula (1/2), calculation (1/2)

Q15. Value of  $d = 5$  (1),  $S_{15} = 555$  (1)

Q16. X-Axis, Y-axis, Origin, Numbering and axis (1)  
Plotting (2)

Q18.  $(x^2-2) \rightarrow$  (1/2), Division (1) Factorization (1), Result (1/2)

Q19. Value of  $n = 12$  (1/2),  $S_n$  value ie  $S_{12} =$  (1/2)

Q20. Value of  $x$  &  $y$  (3)

OR

LCM (1), Transpose, (1), Answer/ calculation (1)

Q21 Rationalization (1½), further calculation (1½)

OR

Using complementary property (1½)

Further calculation (1½)

Q22. Formula (½), calculation (1½)

Q23. Section formula (1)

Q24. Construction of  $\Delta ABC$  (1½)

Construction of similar  $\Delta$  (1½)

Q25. Area of square (1), Area (two semicircles) (1)

Calculation (Answer) (1)

Volume of Sphere (1½), Height of cylinder (1½)

Q26 Statements (2), Formation of quadratic equation (2)

Calculation /Answer/Result (2)

Q27. Figure (1) Given, To Prove, Construction (1) Proof (2)

Value of Attitude (2)

Q28. Figure (1½), Statements (1½), Calculation (3)

Q29. Volume/Capacity of milk in  $\text{cm}^3$  (4½)

Volume/Capacity of milk in liter (½)

Cost (1)

Q30. Mode (3)

Median (3)