

KENDRIYA VIDYALAYA BADDOWAL CANTT
COMPETANCY BASED QUESTION FOR CLASS X MATH
SUMMER VACATION HOLIDAY HOMEWORK
Chapter -1 REAL NUMBERS

Question 1 On Diwali, Megha decorated her balcony with colored bulbs. These bulbs are arranged in the pattern red, yellow and blue. The red bulb blinks after every 5 seconds, the yellow bulbs blink after every 8 seconds and the blue bulbs blink after every 10 seconds.

- (i) After how many seconds will all the bulbs blink together?
- (ii) How many times will they blink together in 1 hour?

Question 2 2 Bells toll together at 9.00 am. They toll after 8 and 12 minutes respectively. At what time will they toll together first time after 9:00 am?

Question 3 A grill has to be fixed to a window of length 60cm and breadth 36cm. what should be the maximum width between the grill bars so that spacing between the bars are equal?

Question 4 Mrs. Latha teaches three dance classes. The first class has 24 students. The second class has 30 students. The third class has 18 students. Mrs. Latha wants to divide each class into groups so that every group in every class has the same number of students and there are no students left over.

- (i) What is the maximum number of students that she can put into each group ?
- (ii) How many groups will second class have?

Question 5 There are 104 students in Class X and 96 students in Class IX in a school. In the periodic test examination, students are to be evenly seated in parallel rows such that no two adjacent rows are of the same class.

- (i) Find the maximum number of parallel rows of each class for the seating arrangement.
- (ii) Find the number of students of Class IX and also of Class X in a row.

Question 6 Megha has 143 stamps; she gives away 11 stamps and divides the remaining equally into groups. Abdul has 220 stamps; he gives away 11 stamps and divides the remaining equally into groups. They end up with the same number of groups.

- (i) What is the number of groups?
- (ii) What is the number of stamps in Megha and Abdul's groups?

Chapter -2 Polynomials

Question 1 Sketch the graph of a polynomial function that satisfies all of the following conditions:

1. Has four real roots (x-intercepts) , two negative roots and one positive
2. Also Includes one root at the origin (x=0)

Question 2 The population of a certain species of fish in a lake can be modeled by a cubic polynomial: $P(t) = -2t^3 + 15t^2 + 30t + 100$. What is the population at year 5 ?

Question 3 Anju is designing a rectangular garden with a path around it. The area of the garden is given by the quadratic polynomial $A(x) = x^2 + 10x + 24$ where x is the width of the path.

- (i) What is the area of the garden when the path is 3 meters wide?
- (ii) If the total area is 195 square meters, what are the possible widths of the path?

Question 4: Projectile Motion Scenario:

A soccer ball is kicked upward with an initial velocity of 20 m/s from a 25-meter hill. The height of the ball at any time t seconds is given by the equation:

$$h(t) = -5t^2 + 20t + 25$$

where h(t) is the height in meters and t is the time in seconds.

- (i) Find the height of the ball after 3 seconds.
- (ii) Determine the time when the ball hits the ground.
- (iii) Calculate the maximum height reached by the ball and the time it takes to reach it.

Question 5: Height of Liquid Nitrogen in a Factory Tank Scenario:

In a factory, the height of liquid nitrogen in a sealed tank (measured in meters) is being monitored during a controlled chemical reaction. The height follows a quadratic pattern over time. The height H(t), in meters, after t minutes is given by the equation: $H(t) = t^2 - 6t + 9$

where: H(t) is the height of liquid nitrogen from the start of observation, and t is the time in minutes

- (i) What is the height after 2 minutes?
- (ii) When will the height be at its minimum?
- (iii) What is the minimum height recorded in the tank?

PAIR OF LINEAR EQUATION IN TWO VARIABLES

- 1) The sum of the digits of a two digit number is 9. The number obtained by reversing the order of digits of the given number exceeds the given number by 27. Find the given number.
- 2) . Solve the following system of equations graphically for x and y: $3x + 2y = 12$; $5x - 2y = 4$. Find the co-ordinates of the points where the lines meet the y-axis.

3) Find the value(s) of k so that the pair of equations $x + 2y = 5$ and $3x + ky + 15 = 0$ has a unique solution.

4) Find the values of a and b for which the following pair of linear equations has infinitely many solutions: $2x + 3y = 7$; $(a + b)x + (2a - b)y = 21$

5) Solve for x and y : $2x + 3y = 7$; $4x + 3y = 11$. Using substitution method.

6) The pair of linear equations $2x + 3y = 5$ and $4x + 6y = 10$ is (a) inconsistent (b) consistent (c) dependent consistent (d) none of these

7. The pair of equations $y = 0$ and $y = -7$ has

(a) one solution (b) two solutions (c) infinitely many solutions (d) no solution

8. The pair of equations $x = 4$ and $y = 3$ graphically represents lines which are

(a) parallel (b) intersecting at $(3, 4)$ (c) coincident (d) intersecting at $(4, 3)$

9. A pair of linear equations which has a unique solution $x = 2$, $y = -3$ is

(a) $x + y = -1$; $2x - 3y = -5$ (b) $2x + 5y = -11$; $4x + 10y = -22$
(c) $2x - y = 1$; $3x + 2y = 0$ (d) $x - 4y - 14 = 0$; $5x - y - 13 = 0$

10. If $x = a$, $y = b$ is the solution of the pair of equations $x - y = 2$ and $x + y = 4$, then the respective values of a and b are (a) 3, 5 (b) 5, 3 (c) 3, 1 (d) $-1, -3$

