SHIKSHA CLASSES

Sub. : Maths.	**Question Paper**	Total Marks : 30
Std. X (CBSE)	3 : Linear Equations in two Variables.	Time : 1 hour

Section : A (Each 1 Mark)

Multiple choice Questions (MCQs).

Q.1 : The pairs of equations $x + 2y - 5 = 0$ and $-4x - 8y + 20 = 0$ have:

    a) Unique solution   b) Exactly two solutions

    c) Infinitely many solutions   d) No solution

Q.2 : If a pair of linear equations is consistent, then the lines are:

    a) Parallel   b) Always coincident

    c) Always intersecting   d) Intersecting or coincident

Q.3 : If the lines $3x + 2ky - 2 = 0$ and $2x + 5y + 1 = 0$ are parallel, then what is the value of k?

    a) $\dfrac{4}{15}$ b) $\dfrac{15}{4}$ c) $\dfrac{4}{5}$ d) $\dfrac{5}{4}$

Q.4 : The pair of equations $x = 0$ and $y = 0$ represents.......

    a) Parallel lines   b) Coincident lines

    c) Intersecting lines and are perpendicular

    d) Non intersecting lines

Q.5 : The age of a son is one third the age of his mother. If the present age of mother is x years, then the age of the son after 12 years is

    a) $\dfrac{x}{3} + 12$ b) $\dfrac{x}{3} + 4$ c) $x + 4$ d) $\dfrac{x}{3} - 12$

Q.6 : The point of intersection of the lines $x - 2 = 0$ and $y + 6 = 0$ is

    a) $(-2, 6)$ b) $(2, 0)$ c) $(0, -6)$ d) $(2, -6)$

Q.7 : The pair of equations $x + y = 0$ and $x + y = -7$ has

    a) one solution   b) two solution

    c) infinitely many solutions   d) no solutions

Q.8 : If $ad \neq bc$, then the pair of linear equations $ax + by = p$ and $cx + dy = q$ has .....

a)   no solution   b)   infinitely many solutions

c)   unique solution   d)   exactly two solutions

Q.9 : The pair of linear equations $3x + 5y = 3$, $6x + ky = 8$ does not have a solution if

a) $k = 5$ b) $k = 10$ c) $k \neq 10$ d) $k \neq 5$

For question number 10 to 11 two statements are given one labeled Assertion and other labeled Reason select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below

a)   Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

b)   Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

c)   Assertion (A) is true but reason (R) is false.

d)   Assertion (A) is false but reason (R) is true.

Q.10 : **Assertion:** The graph of the linear equations $3x+2y=12$ and $5x-2y=4$ gives a pair of intersecting lines.

Reason: The graph of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ gives a pair

of intersecting lines if $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2}$

Q.11 : **Assertion:** A pair of linear equations has no solution (s) if it is represented by intersecting lines graphically.

Reason: If the pair of lines are intersecting, then the pair has unique solution and is called consistent pair of equations.

Section : B (Each 2 Marks)

Q.12 : The difference between two numbers is 12 and difference between their squares is 408. Find the numbers.

Q.13 : Solve : $\dfrac{x}{a} + \dfrac{y}{b} = 2$

$ax - by = a^2 - b^2$

OR

The sum of two numbers is 400 and the difference between their squares is 8000. Find the numbers.

Section : C (Each 3 Marks)

Q.14 : The sum of a two digit number and the number formed by interchanging its digits is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sum of the digits in the first number find the first number.

Q.15 : The area of a rectangle gets reduced by 9 square units. If its length is reduced by 5 units and the breadth is increased by 3 units. If we increase the length by 3 units and breadth by 2 units, the area is increased by 67 square units. Find the length and breadth of the rectangle.

OR

The sum of the numerator and denominator of a fraction is 3 less than twice the denominator. If the numerator and denominator are decreased by 1, the numerator becomes half the denominator Determine the fraction.

OR

Solve the system of equations for x :

$$\frac{5}{x-1} + \frac{1}{y-2} = 2 \quad \text{and} \quad \frac{6}{x-1} - \frac{3}{y-2} = 1$$

Section - D(Each 5 Marks)

Q.16 : 8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can finish it 5 in 14 days. Find the time taken by one man alone and that by one boy alone to finish the work.

OR

A train covered a certain distance at a uniform speed. If the train could have been 10 Km/hr. faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 Km/hr, it would have taken 3 hours more than the scheduled time. Find the distance covered by train.

Section : E

Q.17 : Case Study :

Speed of boat upstream and downstream

If a boat goes in the opposite direction to the stream, it is called upstream. The net speed of the boat is called the upstream speed.

Let the speed of the boat in still water be x km/h and speed of the stream by y km/h.

Speed of the boat upstream = Speed of the boat in still water – Speed of stream
i.e. (x – y) km/h

If a boat goes along direction of the stream, it is called downstream. The net speed of the boat is called the downstream speed.

Speed of the boat downstream = Speed of the boat in still water + Speed of the stream
i.e. (x + y) km/h

Now let us consider the following case

A boat goes 32 km upstream and 36 km downstream in 7 hours. In 9 hours, it can go 40 km upstream and 48 km downstream.

i)   Find the expression for the time taken by the boat (in hours) to cover 32 km upstream.   1

ii)   Find the expression for the time taken by the boat (in hours) to cover 36 km downstream.   1

iii) Find the equation for the total time taken by the boat to cover 40 km upstream and 48 km downstream in 9 hours.   2

OR

A boat can travel with a speed of 14 km/h in still water. If the speed of the stream is 3 km/h. Find the time taken by the boat to go 68 km downstream.

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