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Test / Exam Name: Maths - Linear Equations In Two Variables **Standard: 10th** **Subject: Mathematics**

Student Name: ..... **Section:** ..... **Roll No.:** .....

Questions: 27 | Time: 01:45 hh:mm | Marks: 50

Instructions

1. New section on new page
2. Rough work at the last page should be in proper manner too
3. Honesty is the best policy.

SECTION-A

Q1. If 1 is a root of the equations $ay^2 + ay + 3 = 0$ and $y^2 + y + b = 0$, then ab equals: **1 Mark**

A 3 **B** $-\frac{7}{2}$ **C** 6 **D** -3

Q2. If the point P(k, 0) divides the line segment joining the points A(2, -2) and B(-7, 4) in the ratio 1 : 2, then the value of k is: **1 Mark**

A 1 **B** 2 **C** -2 **D** -1

Q3. The pair of linear equations. **1 Mark**
$\frac{3x}{2} + \frac{5y}{3} = 7$ and $9x + 10y = 14$ is:

A Consistent. **B** Inconsistent.
C Consistent with one solution. **D** Consistent with many solutions.

Q4. The value of k, for which the pair of linear equations $kx + y = k^2$ and $x + ky = 1$ have infinitely many solutions is: **1 Mark**

A ± 1 **B** 1 **C** –1 **D** 2

Q5. The pair of linear equations y = 0 and y = -6 has. **1 Mark**

A A unique solution **B** No solution
C Infinitely many solutions **D** Only solution (0, 0)

Q6. If the point P (6, 2) divides the line segment joining A (6, 5) and B (4, y) in the ratio 3 : 1, then the value of y is. **1 Mark**

A (2, 0) **B** (0, 2) **C** (3, 0) **D** (2, 2)

Q7. The value of k for which the system of equations x + y -4 = 0 and 2x + ky = 3 has no solution, is: **1 Mark**

A -2 **B** ≠2 **C** 3 **D** 2

Q8. The value of λ for which $(x_2 + 4x + \lambda)$ is a perfect square, is: **1 Mark**

A 16 **B** 9 **C** 1 **D** 4

Q9. The pair of linear equations ax + by = c and px + qy = r has a unique solution then: **1 Mark**

A ap = bq **B** ap ≠ bq **C** aq ≠ bp **D** aq = bp

Q10. The HCF of two numbers a and b is 5 and their LCM is 200. Find the product ab. **1 Mark**

Q11. Find the value of k so that the following system of equations has no solution: **1 Mark**
3x - y - 5 = 0; 6x - 2y - k = 0

Q12. For what value of k will k + 9, 2k - 1 and 2k + 7 are the consecutive terms of an AP.? **1 Mark**

Q13. Find the number of solutions of the following pair of linear equations: **1 Mark**
x + 2y - 8 = 0
2x + 4y = 16

Q14. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following: **1 Mark**

Assertion: The value of k for which the system of equations 3x + ky =0, 2x - y =0 has a unique solution is $k \neq -\frac{3}{2}$.

Reason: The system of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has a unique solution if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

A Both assertion (A) and reason (R) are true and reason (R) isthe 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

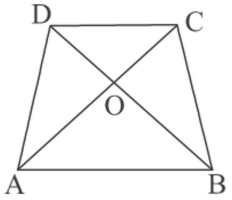
Q15. Do the following equations represent a pair of coincident lines? Justify your answer: **1 Mark**
$\frac{x}{2} + y + \frac{2}{5} = 0$ and $4x + 8y + \frac{5}{16} = 0$

SECTION-B

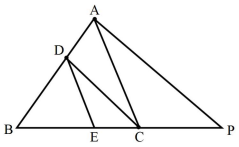
Q16. Solve the following system of linear equations 7x - 2y =5 and 8x + 7y = 15 and verify your answer. **2 Marks**

Q17. Find the value(s) of k for which the pair of linear equations kx + 3y = k - 2 and 12x + ky = k has no solution. **2 Marks**

Q18. Diagonals trapezium AC and BD of a ABCD intersect at O, where AB∣DC. If $\frac{DO}{OB} = \frac{1}{2}$, then show that AB =2CD **2 Marks**



Q19. In Fig. DE∥AC. and DC∥AP. Prove that $\frac{BE}{EC} = \frac{BC}{CP}$. **2 Marks**



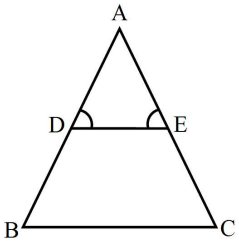
Q20. On comparing the ratios $\frac{a_1}{a_2} = \frac{b_1}{b_2}$ and $\frac{c_1}{c_2}$, find out whether the following pair of linear equations are consistent, or inconsistent. **2 Marks**
$\frac{3}{2}x + \frac{5}{3}y = 7, 9x - 10y = 14$

Q21. In what ratio does the point $\left(\frac{24}{11}, y\right)$ divide the line segment joining the points P(2, - 2) and Q(3, 7)? Also find the value of y. **3 Marks**

Q22. If the points A(–1, –4), B(b, c) and C(5, –1) are collinear and 2b + c = 4, find the values of b and c. **3 Marks**

Q23. Solve for x: $\frac{16}{x} - 1 = \frac{15}{x+1}; x \neq 0, -1.$ **3 Marks**

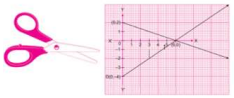
Q24. In Fig $\angle D = \angle E$ and $\frac{AD}{DB} = \frac{AE}{EC}$, prove that BAC is an isosceles triangle. **3 Marks**



SECTION-C

Q25. Solve for x: $\frac{1}{(2a+b+2x)} = \frac{1}{(2a)} + \frac{1}{(b)} + \frac{1}{(2x)}$ **4 Marks**

Q26. **Read the case study given below and answer the questions that follow:** **4 Marks**
The scissors which are so common in our daily life use, its blades represent the graph of linear equations.



Let the blades of a scissor are represented by the system of linear equations:
x + 3y = 6 and 2x – 3y = 12

1. Write the given system of linear equations.
2. Identify the coefficients of x and y in the first equation.
3. Solve the given system of linear equations by the method of substitution.

OR

3. Verify the solution x = 6 and y = 0 in the second equation.

Q27. Solve the following system of equations by the method of cross-multiplication: **5 Marks**
$bx + cy = a + b$
$ax\left(\frac{1}{a-b} - \frac{1}{a+b}\right) + cy\left(\frac{1}{b-a} - \frac{1}{b+a}\right) = \frac{2a}{a+b}$