

ONE MARK & TWO MARKS SPECIAL TEST, 2011 - 2012**STANDARD X**

Reg. No.

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MATHEMATICS

[Marks : 75]

Time : 1.30 hrs.]

[(Algebra (68–117), Statistics (279–298))]

PART – I

25X1=25

Note: Answer ALL the questions. Choose the correct answer and write the alphabet only :

- A system of two linear equations in two variables is inconsistent, if their graphs
 - coincide
 - intersect only at a point
 - do not intersect at any point
 - cut the x-axis
- The system of equations $x - 4y = 8$, $3x - 12y = 24$
 - has infinitely many solutions
 - has no solution
 - has a unique solution
 - may or may not have a solution
- The sum of two zeros of the polynomial $f(x) = 2x^2 + (p + 3)x + 5$ is zero, then the value of 'p' is
 - 3
 - 4
 - 3
 - 4
- The remainder when $x^2 - 2x + 7$ is divided by $x + 4$ is
 - 28
 - 29
 - 30
 - 31
- When $f(x)$ is divided by $ax + b$, the remainder is
 - $f\left(\frac{b}{a}\right)$
 - $f\left(-\frac{b}{a}\right)$
 - $f\left(\frac{a}{b}\right)$
 - $f(ab)$
- The G.C.D. of $(x^3 + 1)$ and $x^4 - 1$ is
 - $x^3 - 1$
 - $x^3 + 1$
 - $x + 1$
 - $x - 1$
- The L.C.M. of a^k, a^{k+3}, a^{k+5} where $k \in \mathbb{N}$ is
 - a^{k+9}
 - a^k
 - a^{k+6}
 - a^{k+5}
- The lowest form of the rational expression $\frac{x^2 + 5x + 6}{x^2 - x - 6}$ is
 - $\frac{x - 3}{x + 3}$
 - $\frac{x + 3}{x - 3}$
 - $\frac{x + 2}{x - 3}$
 - $\frac{x - 3}{x + 2}$
- If $\frac{a + b}{a - b}$ and $\frac{a^3 - b^3}{a^3 + b^3}$ are the two rational expressions, then their product is
 - $\frac{a^2 + ab + b^2}{a^2 - ab + b^2}$
 - $\frac{a^2 - ab + b^2}{a^2 + ab + b^2}$
 - $\frac{a^2 - ab - b^2}{a^2 + ab + b^2}$
 - $\frac{a^2 + ab + b^2}{a^2 - ab - b^2}$
- On dividing $\frac{x^2 - 25}{x + 3}$ by $\frac{x + 5}{x^2 - 9}$ is equal to
 - $(x - 5)(x - 3)$
 - $(x - 5)(x + 3)$
 - $(x + 5)(x - 3)$
 - $(x + 5)(x + 3)$
- If $\frac{a^3}{a - b}$ is added with $\frac{b^3}{b - a}$, then the new expression is
 - $a^2 + ab + b^2$
 - $a^2 - ab + b^2$
 - $a^3 + b^3$
 - $a^3 - b^3$
- The square root of $49(x^2 - 2xy + y^2)^2$ is
 - $7|x - y|$
 - $7(x + y)(x - y)$
 - $7(x + y)^2$
 - $7(x - y)^2$
- The square root of $x^2 + y^2 + z^2 - 2xy + 2yz - 2zx$ is
 - $|x + y - z|$
 - $|x - y + z|$
 - $|x + y + z|$
 - $|x - y - z|$
- If $ax^2 + bx + c = 0$ has equal roots then 'c' is equal to
 - $\frac{b^2}{2a}$
 - $\frac{b^2}{4a}$
 - $-\frac{b^2}{2a}$
 - $-\frac{b^2}{4a}$
- If α, β are the roots of $ax^2 + bx + c = 0$ then $(\alpha + \beta)^2$ is
 - $-\frac{b^2}{a^2}$
 - $\frac{c^2}{a^2}$
 - $\frac{b^2}{a^2}$
 - $\frac{ab}{c}$
- If the discriminant of a quadratic equation is (-15) then the roots are
 - imaginary
 - real & unequal
 - irrational
 - real & equal
- The founder of modern field of statistics is
 - R.A.Fisher
 - Horace Secrist
 - J.F. Baron
 - Karl Pearson
- The range of the first 10 prime numbers 2,3,5,7,11,13,17,19,23,29 is
 - 28
 - 26
 - 29
 - 27
- The greatest value of a collection of data is 72 and the least value is 28. Then the coefficient of range is
 - 44
 - 0.72
 - 0.44
 - 0.28

20. For any collection of 'n' items, $\sum (x - \bar{x}) =$
- a) $\sum x$ b) \bar{x} c) $n\bar{x}$ d) 0
21. If 't' is the standard deviation of x,y,z, then the standard deviation of x + 5, y + 5, z + 5 is
- a) $\frac{t}{3}$ b) t + 5 c) t d) xyz
22. If the variance of a data is 12.25, then the S.D. is
- a) 3.5 b) 3 c) 2.5 d) 3.25
23. If the variance of 14, 18, 22, 26, 30 is 32, then the variance of 28, 36, 44, 52, 60 is
- a) 64 b) 128 c) $32\sqrt{2}$ d) 32
24. The formula to find S.D. is $\sqrt{\frac{\sum d^2}{n}}$ where $d = x - \bar{x}$. The method is
- a) direct method b) Assumed mean method
c) Actual mean method d) step deviation method
25. Mean and standard deviation of a data are 48 and 12 respectively. The coefficient of variation is
- a) 42 b) 25 c) 28 d) 48

PART - II

Note: Answer ALL the questions :

25X2=50

- Solve $3x - 5y = -16$, $2x + 5y = 31$.
- Find a quadratic polynomial if the sum and product of zeros of it are -4 and 3 respectively.
- If one zero of the polynomial $p(x) = (k+4)x^2 + 13x + 3k$ is reciprocal of the other, then find the value of 'k'
- Find a quadratic polynomial with zeros at $x = \frac{1}{4}$ and $x = -1$.
- Find the quotient and remainder when $x^3 + x^2 - 7x - 3$ is divided by $x - 3$.
- Find the G.C.D. of $x^2 - 2xy + y^2$ and $x^4 - y^4$.
- Find the L.C.M. of $(a-1)^5(a+3)^2$, $(a-2)^2(a-1)^3(a+3)^4$.
- Show that $(x-1)$ is a factor of $x^3 - 6x^2 + 11x - 6$.
- Simplify : $\frac{x^2 - 4x - 5}{x^2 - 25} \div \frac{x^2 - 3x - 10}{x^2 + 7x + 10}$
- Simplify : $\frac{(x-8)(x^2 + 5x - 50)}{(x+10)(x^2 - 13x + 40)}$
- Simplify : $\frac{x+2}{x^2+3x+2} + \frac{x-3}{x^2-2x-3}$
- Find the square root of $(x^2 - 25)(x^2 + 8x + 15)(x^2 - 2x - 15)$
- Solve $x^2 + 6x - 7 = 0$ by completing the square method.
- The sum of a number and its reciprocal is $\frac{65}{8}$. Find the number.
- Form the quadratic equation whose roots are $7 + \sqrt{3}$ and $7 - \sqrt{3}$.
- If α and β are the roots of $ax^2 + bx + c = 0$, then find one of the quadratic equations whose roots are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.
- Find the coefficient of range of 43, 24, 38, 56, 22, 39, 45.
- The smallest value of a collection of data is 12 and the range is 59. Find the largest value of the collection of data.
- If $n = 10$, $\bar{x} = 12$ and $\sum x^2 = 1530$, then calculate the coefficient of variation.
- If the coefficient of variation of a collection of data is 57 and its S.D. is 6.84, then find the mean.
- Given $\sum x = 99$, $n = 9$ and $\sum (x - 10)^2 = 79$. Find $\sum x^2$ and $\sum (x - \bar{x})^2$.
- Find the standard deviation of the first 10 natural numbers.
- The coefficient of variations of two series are 58 and 69. Their standard deviations are 21.2 and 15.6. What are their arithmetic means ?
- Find the variance of 10, 10, 10, 10, 10
- Given $\sum (x - \bar{x}) = 48$, $\bar{x} = 20$ and $n = 12$. Find the coefficient of variation.