PADASALAI CREATIVE QUESTIONS 2019-2020

ALGEBRA Date : 26-Jul-19

10th Standard 2019 EM

Maths Reg.No. : | | | | | | |

Use blue or black pen only

Time : 01:30:00 Hrs Total Marks : 50

PART - A

5 x 1 = 5

I. CHOOSE THE CORRECT ANSWER

1) $y^2 + \frac{1}{y^2}$ is not equal to

(a) $\frac{y^2+1}{y^2}$ (b) $\left(y+\frac{1}{y}\right)^2$ (c) $\left(y-\frac{1}{y}\right)^2+2$ (d) $\left(y+\frac{1}{y}\right)^2-2$

2) Which of the following should be added to make $x^4 + 64$ a perfect square

(a) $4x^2$ (b) $16x^2$ (c) $8x^2$ (d) $-8x^2$

3) Graph of a linear polynomial is a

(a) straight line (b) circle (c) parabola (d) hyperbola

4) If number of columns and rows are not equal in a matrix then it is said to be a

(a) diagonal matrix (b) rectangular matrix (c) square matrix (d) identity matrix

5) If $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 0 \\ 2 & -1 \\ 0 & 2 \end{pmatrix}$ and $C = \begin{pmatrix} 0 & 1 \\ -2 & 5 \end{pmatrix}$, Which of the following statements are correct?

(i) AB +C = $\begin{pmatrix} 5 & 5 \\ 5 & 5 \end{pmatrix}$

(ii) BC = $\begin{pmatrix} 0 & 1 \\ 2 & -3 \\ -4 & 10 \end{pmatrix}$

(iii) BA + C = $\begin{pmatrix} 2 & 5 \\ 3 & 0 \end{pmatrix}$

(iv) (AB)C = $\begin{pmatrix} -8 & 20 \\ -8 & 13 \end{pmatrix}$

(a) (i) and (ii) only (b) (ii) and (iii) only (c) (iii) and (iv) only (d) all of these

PART - B

5 x 2 = 10

II. ANSWER THE FOLLOWING QUESTIONS (ANY 5)

6) If α and β are the roots of $x^2 + 7x + 10 = 0$ find the values of
$\alpha^4 + \beta^4$

7) Solve the following system of linear equations in three variables.
x + y + Z = 6; 2x + 3y + 4z = 20;
3x + 2y + Sz = 22

8) Using quadratic formula solve the following equations.
$p^2x^2 + (P^2 - q^2)\,X - q^2 = 0$

9) Using quadratic formula solve the following equations.
$9x^2-9(a+b)x+(2a^2+5ab+2b^2)=0$

10) Find the values of k for which the following equation has equal roots.
(k - 12)r + 2(k - 12)x + 2 = 0

11) Prove that the equation $x^2(a^2+b^2)+2x(ac+bd)+(c^2+ d^2) = 0$ has no real root if $ad \neq bc$.

PART - C

5 x 3 = 15

III. ANSWER THE FOLLOWING QUESTIONS: (ANY 5)

12) Find the LCM of the following

$5x - 10, 5x^2 - 20$

13) Find the values of 'k' such that quadratic equation $(k + 9)x^2 + (k+1)x + 1 = 0$ has no real roots?

14) The sum of two numbers is 15. If the sum of their reciprocals is $\frac{3}{10}$, find the numbers.

15) A two digit number is such that the product of its digits is 12. When 36 is added to the number the digits interchange their places. Find the number.

16) Seven years ago, Varun's age was five times the square of swati's age. Three years hence Swati's age will be two fifth of Varun's age. Find their present ages.

17) A chess board contains 64 equal squares and the area of each square is 6.25 cm^2, A border round the board is 2 cm wide.

PART - D

4 x 5 = 20

IV. ANSWER THE FOLLOWING QUESTIONS: (ANY 4)

18) Simplify $\frac{\frac{1}{p}+\frac{1}{q+r}}{\frac{1}{p}-\frac{1}{q+r}} \times \left(1+\frac{q^2+r^2-p^2}{2qr}\right)$

19) The roots of the equation $2x^2 - 7x + 5 = 0$ are α and β. Without solving for the roots, find $\frac{\alpha+2}{\beta+2}+\frac{\beta+2}{\alpha+2}$

20) Graph the following quadratic equations and state their nature of solutions.

$(2x - 3)(x + 2) = 0$

21) If α and β are the roots of the polynomial $f(x) = x^2 - 2x + 3$, find the polynomial whose roots are $\frac{\alpha-1}{\alpha+1}, \frac{\beta-1}{\beta+1}$

22) Find two consecutive natural numbers whose product is 20.

23) A two digit number is such that the product of its digits is 18, when 63 is subtracted from the number, the digits interchange their places. Find the number.

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