ANANDALAYA
PERIODIC TEST -1
Class : IX

विद्या सर्वार्थ साधिका

Subject: Mathematics   M.M: 40
Date   : 20/ 07/2019   Time: 2 Hours

General Instructions:
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    i)   All questions are compulsory.
    ii)   This question paper contains 19 questions.
    iii)   Questions 1- 8 in Section A are very short-answer type questions carrying 1 mark each.
    iv)   Questions 9-12 in Section B are short-answer type questions carrying 2 marks each.
    v)   Questions 13-16 in Section C are long-answer I type questions carrying 3 marks each.
    vi)   Questions 17 -19 in Section D are long-answer II type questions carrying 4 marks each

SECTION – A

1. Which ordered pair is a solution of $y = 4x$?   (1)
    (a)   (16, 4)   (b) (4, 4)   (c) (4, 16)   (d) (2, 4)

2.   (-2, 0) lies on the   (1)
    (a) y- axis   (b)   x- axis   (c) y = x   (d) x + y = 0

3. Decimal representation of a rational number cannot be   (1)
    (a) terminating   (b) non-terminating
    (c) non-terminating repeating   (d) non-terminating non-repeating

4. Which one of the following is a polynomial?   (1)
    (a) $\frac{x}{2} - x^{-2}$ (b) $\sqrt{5x} - 1$ (c) $x^2 + \frac{1}{x^{-1}}$ (d) $\frac{1}{x} + x$

5. Justify 3.070070007 is a rational number.   (1)

6. Find the value of $\dfrac{(27)^{2/3} \times (8)^{2/3}}{(9)^{\frac{3}{2}}}$ (1)

7. The degree of the polynomial p(x) = $3x^5(2x^2 - x + 6)$ is _____   (1)

8. If $P(x) = x^2 - 3\sqrt{3}\,x + 1$ then find $P(3\sqrt{3})$.   (1)
                    OR
    If $f(x) = x^2 - 4x + 6$ find $f(1) - f(-1)$

SECTION – B

9   Show that : $\dfrac{(x^{b+c})^2 \, (x^{a+b})^2 \, (x^{a+c})^2}{(x^a \, x^b x^c)^4} = 1$ (2)

10. Find the value of a, if the line $3y = ax + 7$ passes through the point   i) (3 , 4)   (ii) (1, 2)   (2)
                    OR
    Four years before age of mother was 3 times the age of her daughter. Write a linear equation to
    represent this situation in the form $ax + by + c = 0$.

11. If the point $(2k - 3, k + 2)$ lies on the line $2x + 3y + 14 = 0$, find k.   (2)

12. Find the value of a if the polynomial $f(x) = x^4 - 2x^3 + 3x^2 - ax + 3a - 7$ when divided by $(x + 1)$ leaves the remainder 19 (2)

OR

By remainder theorem, find the remainder when $p(y)$ is divided by $g(y)$, where
$p(y) = 4y^3 - 12y^2 + 5y - 4$ and $g(y) = 2y - 1$.

SECTION – C

13 Match the columns I and II. (3)

I		II	
i)	$4x + 3y = 12 \; cuts \; the \; x - axis \; at$	a)	$(0, y)$
ii)	$x = a \; is \; a \; line$	b)	$4x - 3y = 7$
iii)	$(1, -1)$ is a solution of the equation	c)	(a, a)
iv)	Any point on y-axis is of the form	d)	$(3, 0)$
v)	Any point on $y = x \; is \; of \; the \; form$	e)	$x + 2y = 1$
vi)	$x = -3, y = 2$ is a solution of the equation	f)	Parallel to y- axis

14. Factorise: i) $2y^3 + y^2 - 2y - 1$. (3)
    ii) $32x^4 - 2y^4$

15. If $x = 2 + \sqrt{3}$, find the value of $x^3 + \dfrac{1}{x^3}$ (3)

OR

Express $1.3\bar{2} + 0.\overline{35}$ as a fraction in simplest form.

16 If $\dfrac{3 + \sqrt{7}}{3 - \sqrt{7}} + \dfrac{3 - \sqrt{7}}{3 + \sqrt{7}} = a + b\sqrt{7}$, find the values of $a \; and \; b$. (3)

SECTION – D

17. Prove that : $\dfrac{1}{3_- + \sqrt{7}} + \dfrac{1}{\sqrt{7} + \sqrt{5}} + \dfrac{1}{\sqrt{5} + \sqrt{3}} + \dfrac{1}{\sqrt{3} + 1} = 1$ (4)

OR

Simplify : $\dfrac{7\sqrt{3}}{\sqrt{10} + \sqrt{3}} - \dfrac{2\sqrt{5}}{\sqrt{6} + \sqrt{5}} - \dfrac{3\sqrt{2}}{\sqrt{15} + 3\sqrt{2}}$

18. If $a + b + c = 5$ and $ab + bc + ca = 10$, then prove that $a^3 + b^3 + c^3 - 3abc = -25$ (4)

19. The parking charges of a car in a parking lot is ` 20 for the first 3 hours and ` 10 for subsequent hours. Taking total parking time to be x hours and total charges as ` y, write a linear equation in two variables to express the above statements. Draw a graph for the linear equation and read the charges for five hours. (4)