AN EDUCATIONAL INSTITUTE

Unit Test Series 01 (2023-24)

SUBJECT: MATHEMATICS **MAX. MARKS : 40**
CLASS : IX **DURATION : 90 min**

Syllabus : CH - 1 Number System ,CH - 2 Polynomials

General Instruction:

1. This Question Paper has 5 Sections A-E.
2. **Section A** has 5 MCQs carrying 1 mark each.
3. **Section B** has 3 questions carrying 02 marks each.
4. **Section C** has 5 questions carrying 03 marks each.
5. **Section D** has 1 questions carrying 04 marks each.
6. **Section E** has 2 questions carrying 05 marks each .

Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated

SECTION – A
Questions 1 to 5 carry 1 mark each.

1. $\sqrt[4]{\sqrt[3]{2^2}}$ is equal to

(a) $2^{-\frac{1}{6}}$ (b) 2^{-6} (c) $2^{\frac{1}{6}}$ (d) 2^6

2. On rationalizing the denominator of $\frac{1}{\sqrt{4}-\sqrt{3}}$, we get

(a) $\frac{\sqrt{4}+\sqrt{3}}{\sqrt{4}-\sqrt{3}}$ (b) $\sqrt{4}+\sqrt{3}$ (c) $\frac{\sqrt{4}+\sqrt{3}}{\sqrt{4}-\sqrt{3}}$ (d) $\sqrt{4}-\sqrt{3}$

3. The coefficient of the leading term in $3x - 12x^2 + 9x^7 - x^5 + 13x^3$

(a) 3 (b) -12 (c) 9 (d) -1

4. The zeros of $x^2 - 7x + 12$ are :

(a) 3 ,5 (b) -1, 2 (c) 2, 5 (d) -2, 5

5. which of the following is true ?

(a) Every whole number is a natural number (b) every integer is a rational number
(c)every rational number is an integer (d) every integer is a whole number

SECTION – B
Questions 6 to 8 carry 2 mark each.

6. Write the given irrational numbers in ascending order $\sqrt{2}$, $\sqrt[3]{3}$, $\sqrt{7}$

7. Simplify $\sqrt{7+2\sqrt{10}}$

Or

Represent $\sqrt{2}$ and $\sqrt{3}$ on the same number line .

8. Factorise: $\frac{25}{4}x^2 - \frac{y^2}{9} - \frac{5}{2}x + \frac{y}{3}$.

SECTION – C
Questions 9 to 13 carry 3 mark each.

9. If x = $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, then find the value of x^2 .

10. Express the following in the form of p/q where p and q are integers and q ≠ 0

$0.\overline{4} + 0.\overline{18}$

11. if x = $\frac{2+\sqrt{3}}{2-\sqrt{3}}$, y = $\frac{2-\sqrt{3}}{2+\sqrt{3}}$, find the value of $x^2 - y^2$.

Or

Find a and b if

$\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = a + 7\sqrt{5}b$.

12. If $p(y) = y^2 - 4y + 4$, then find the value of p (2) + p(-2) + p (1)

13. Find the value of

$$\frac{4}{(216)^{-\frac{2}{3}}} + \frac{1}{(256)^{-\frac{3}{4}}} + \frac{2}{(243)^{-\frac{1}{5}}}$$

SECTION – D
Questions 14 carry 4 mark each.

14. Dhruv a student of Class IX visited a book shop of his school for purchasing the math lab kit Mr.Rao , Who is running the bookshop in school told Dhruv that math lab kit consists of a lab manual and a notebook and the total cost lab kit is $x^2 + 6x + 9$ .He also told Dhruv that total price of kit includes individual price of manual and notebook .

Based on the above information ,answer the following questions :

a) what is the degree of the given polynomial ?

b) Find out the possible individual price for lab manual and notebook in terms of x .

c) Find the zeroes of the polynomial $p(x) = x^2 + 6x + 9$ .Also verify if (x-2) is a factor of p(x) .

SECTION – E
Questions 15 to 16 carry 5 mark each

15. Find $x^2 + y^2 - xy$ where $x = \frac{1}{2+\sqrt{3}}$, $y = \frac{1}{2-\sqrt{3}}$.

Or

$show\ that\ \frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5$

16. (i) Factorize : $4x^2 + 9y^2 + 16z^2 + 12xy + 24yz + 16xz$ by using proper identity .

(ii)Factorize : $27p^3 - \frac{1}{216} - \frac{9}{2}p^3 + \frac{1}{4}p$ by using proper identity .

(iii)Factorize:$4913x^3 - 8y^3$ by property

End