

## SAFAL EDUCATION ACADEMY

## STANDARD – X

## MATHS

[Paper – 5]

TIME : 1.0 Hr

NAME : \_\_\_\_\_

MARKS : 50

Marks Obtained : \_\_\_\_\_

## Q – 1 Solve the following [6]

1. Find the values of rational numbers a and b.

$$\frac{3+\sqrt{5}}{2\sqrt{5}+3} = a+b\sqrt{5}.$$

2. If x and y are rational numbers and find the values of x and y.

$$\frac{2+\sqrt{3}}{2-\sqrt{3}} = x+y\sqrt{3}$$

3. Solve for x:

$$\sqrt{\frac{a}{b}} = \left(\frac{b}{a}\right)^{1-3x}$$

4. If

$$x = 2^{\frac{1}{3}} + 2^{-\frac{1}{3}}, \text{ prove that } 2x^3 = 6x + 5.$$

5. If

$$\frac{\log a}{b-c} = \frac{\log b}{c-a} = \frac{\log c}{a-b}, \text{ prove that } a^a \cdot b^b \cdot c^c = 1$$

6. Express following as a single logarithm

$$2 \log 3 - \frac{1}{2} \log 16 + \log 12$$

7. A sailor goes 8km downstream in 40 minutes and returns back to the starting point in I hour. Find the speed of the sailor in still water and the speed of the current.

8. 5 years ago, the age of a man was 7 times the age of his son. After five years the age of the man will be 3 times the age of his son from now. How old are the man and his son now?

9. A number is of two digits. The sum and the difference of the number and that formed by reversing the digits are 99 and 45 respectively. Find the number.

10. Find the amount on Rs. 16500 after 2 years, if the rate of interest being 8% for the first year and 10% for the second year compounded annually.

11. Calculate the compound interest for second year on Rs. 5,000 invested for 3 years at 10% p.a.

12. If
- $a + 1/a = 4$
- , find the value of

$$(i) a^2 + \frac{1}{a^2} \quad (ii) a^4 + \frac{1}{a^4}$$

13. If
- $p^2 - 3p + 1 = 0$
- , find
- $p + 1/p^2$

14. Factorise:
- $2x^2 - 7x - 39$
- .

15. Factorise :
- $x^2 + y^2 - z^2 - 2xy$
- .

16. Factorise:
- $(x + 1)^2 + 5(x + 1) - 14$

17. Solve the following equation

$$x + y = 2xy; \frac{x-y}{xy} = 1$$