Nalanda College -Colombo 10

1st Term Test - 2020

Mathematics

Grade 09

Name: ………………………………………. Class: ……………. Index No: …………………

Part I

Answer all the questions on the paper itself.

1. Simplify $1.73 + 17.73$

2. Factorize $x - ay - ax + y$

3. Simplify $101101_{two} + 1101_{two}$

4. Factorize $4a^2 - 1$

5. Convert 101011_{two} into a decimal number

6. Expand $\left(x + \frac{1}{x}\right)^2$

7.   An item was brough for Rs. 5,000/=, sold out for Rs. 5,250/=. Find the profit precentage.

8.   General term of a number pattern is $3n + 1$. Find 25th term

9.   Simplify $\frac{3}{4}$ of $(\frac{1}{4} + \frac{2}{3})$

10.   Find the general term of following number pattern   100, 95, 90, 85 ……..

11.   (i) Obtain area of the shaded part
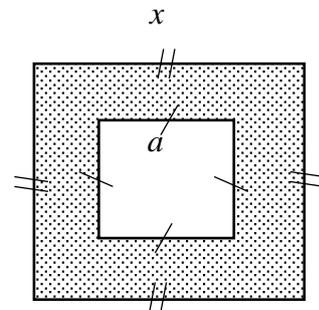
        (ii) Factorize above obtained expression

12.   Convert 23 in to a binary number

13.   (i) Find volume of given cuboid shaped vessel
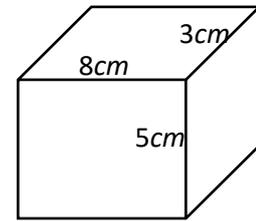
                 (ii) Express it in *ml*

14.   If AB is a strength line, find *x*
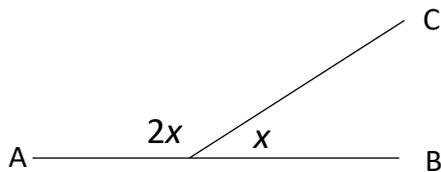
15.   Length, breath and height of a tank are 5m, 3m and 1m respectively. Find the capacity of it in *liters*.

16.   Factorize $a^2 - a - 12$

17.   Find *x*
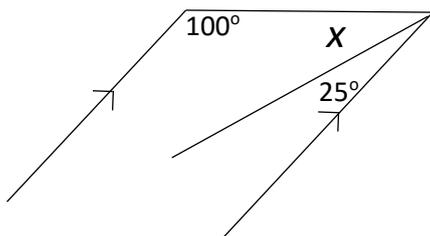
18.   When selling a land for Rs. 5,000,000/= a broker received a commission of 2%. Find the commission he got.

19.   Kamal spent Rs. 12,000/= which was 2/5 of his monthly salary. Find his monthly salary.

20.   Fill in the blanks

A   B   C   D

AB = CD (Data)

AB + ………. = CD + BC (………….)

AC = BD

Part II

Answer first question and four other questions.

1.   a.   Price of a bicycle is Rs.3000/=

        i.   If price increased by 10%
        ii. If price decreased by 10% find the new price.

    b.   A vendor marks price of a television keeping 40% profit. When purchasing it outright vendor gives 10% discount. Outright price of a television is Rs.50,400/=

        i.   Find the marked price of the television.
        ii. Calculate the discount given.
        iii. Find the purchasing price of television by the vendor.
        iv. Find the net profit.

    c.   3% Commission is given when selling a motor vehicle for Rs.3,000,000/=.

        i.   Find the commission.
        ii. Find the amount received by the owner from the transaction.

2.   In a cuboid shaped tank area of the base is $30m^2$ and height is 6m.

    a. Find the capacity of the tank in liters.

    b. If 2/3 of the tank is filled with water, find the height of the water level.

    c. Find the volume of the water in the tank.

    d. If 300l of water is removed per minute, find the time taken to make the tank empty.

3.   a.   If a=1/2 and b = (-1/3), evaluate

        i.   4a-9b
        ii. 2a+3b

    b.   Expand and simplify

        i.   (2x+3) (x-2)
        ii. $(x+5)^2$

    c.   If y=3, Verify $(y+1)(y-5) = y^2-4y-5$

4.　　Following shapes are made using iron rods.
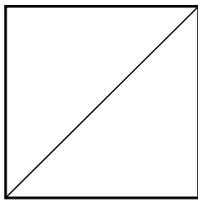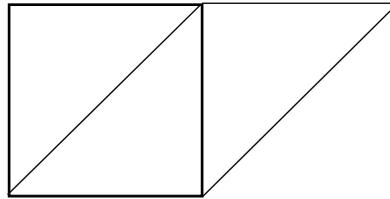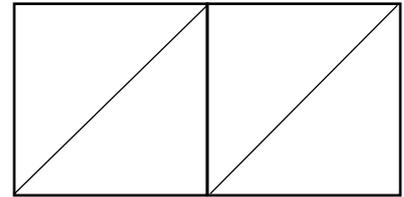
　　　　　(1)　　　　　　　　　　　　(2)　　　　　　　　　　　　(3)

　　a.　Find the number of iron rods needed for next 3 shapes separately.

　　b.　Find the number of rods needed for nth shape.

　　c.　Which shape is made with 27 rods?

　　d.　Find the number of rods needed for $(n+1)^{th}$ shape.

　　e.　Show that a shape can not be made with 50 rods.

5.　　Father gives 2/5 of a land to his son and 1/3 of the land to his daughter. He kept the remaining land for himself.

　　a.　What fraction of the total land received by son and daughter?

　　b.　Find the fraction of the land kept by father.

　　c.　If father kept 8 acres, calculate the area of the whole land and areas of the lands received by son and daughter separately.

　　d.　If son and daughter sold half of the land they got, find the fraction of the land sold.

6.

　　a.　　If $A\hat{O}C = B\hat{O}D$, show that $A\hat{O}B = C\hat{O}D$
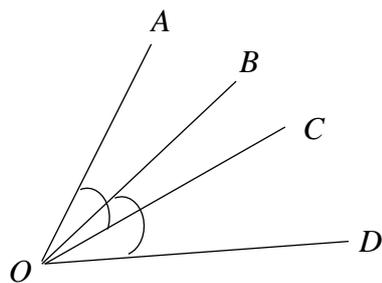
b. AC is a straight-line segment and BD and BF are bisectors of the angles $A\hat{B}E$ and $E\hat{B}C$ respectively. Show that $D\hat{B}E + E\hat{B}F = 90^o$

c. Find x, y and z