MATHEMATICS

MOEDP-THE SCHOOL ORIENTED PROJECT

HOLIDAY EXAMINATION – FORM FOUR

APRIL 2023

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062   **MATHEMATICS**   **FORM FOUR**

TIME: 2:30 HOURS   **APRIL 2023**

INSTRUCTIONS

1. This paper consists of sections A and B with a total of **FOURTEEN (14)** questions.

2. Answer **ALL** questions in section A and B.

3. Each question in section A carries **six (06)** marks while each question in section B carries **ten (10)** marks.

4. All necessary working and answers for each questions must shown clearly.

5. NECTA mathematical tables and non-programmable calculator may be used.

SECTION A (60 MARKS)

Answer all questions in this section

1. (a) Write 300.3267 correct to;
   (i)   three significant figures
   (ii) three decimal places
   (iii) 698.704 round to the nearest whole numbers

   (b) (i) Evaluate $\sqrt{8935967}$

   (ii) Change $0.9\dot{6}$ in the form of $\frac{a}{b}$ where a and b are integers such that $b \neq 0$

2. (a) Rationalize the denominator of $\frac{3\sqrt{2}+1}{2\sqrt{2}-1}$

   (b) If $\sqrt[3]{64} = 4^y$, find the value of y.

   (c) If $\frac{\log\log y}{\log\log 3} = \frac{\log\log 16}{\log\log 4}$, find the value of y.

3. (a) In a class of 35 students, 21 study commercial subjects, 15 study both commercial and science subjects and 4 students study science subjects only. Use a venn diagram to find the number of students who study:

      i.   Either science or commercial subjects.

      ii.   Neither commercial nor science subjects.

     iii.   Science subjects

(b) What does it mean when we say the probability is;

    (i)   zero

    (ii)   one

4. (a) Prove that the quadrilateral with vertices at A(0,-2), B(4,2), C(0,6), D(-4,2), taken in order, is a square.

(b) Find the equation of the straight line that passes through the mid-point of $A(1,\ 9)$ and $B(-5,\ -3)$ and perpendicular to the line whose slope is $-\frac{1}{4}$.

5. (a) The area of triangle ABC is 60cm². If $\overline{AB} = 10cm$, find $\overline{AC}$ given that the included angle is 150^0.

(b) Using the figure below, prove that $\overline{RS} = \overline{KS}$
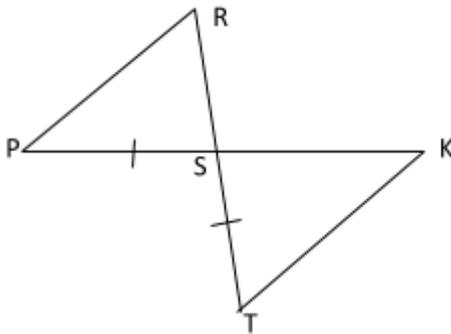
6. The value V of diamond is proportional to the square of its weight W. It is known that a diamond weighting 10 grams is worth Tshs 200,000/=
   (a) Write down the expression which relates V and W.
   (b) Find the value of a diamond weighing 30 grams.
   (c) Find the weight of the diamond worth Tsh.5,000,000/=

7. (a) If 42,000 women is an increase of 20% on the number of women ten years ago, how many women lived in the village?

(b). Mr. Msuta started business on 1ˢᵗ January 2020 with a capital of sh 60,000/=. Then made the following transactions:

    2ⁿᵈ January bought furniture and fitting sh 10,000/=

    3ʳᵈ January bought goods for cash   sh 25,000/=

    4ᵗʰ January sold goods for cash   sh 32,000/=

    6ᵗʰ January paid advertising charges   sh 1,500/=

    7ᵗʰ January bought goods for cash   sh 32,000/=

9th January transport charges	sh 5,000/=	
12th January cash sales	sh 25,000/=	
15th January paid wages	sh 1,200/=	
17th January paid rent	sh 220/=	
20th January cash sales	sh 19,500/=	
22nd January paid electricity	sh 1,800/=	

Prepare cash account and balance it at the end of the month.

8. (a) Find the nth term in the following sequence: 1, 3, 5, 7, 9 …

   (b) Mary wishes to save Tshs 817,500/= in 3 years to purchase a shamba. How much money must she invest now at 5% per annum compound interest in order to buy the shamba?

9. (a) Given that $\tan \, \tan A = \frac{3}{4}$, find the value of: $\frac{\tan\tan A + \sin\sin A}{1 + Cos\,A}$

   (b) Without using mathematical tables evaluate $\frac{Tan45° + sin90°}{Tan30°cos30°sin30°}$

10. (a) Solve for x if $\frac{x}{4} = \frac{5}{x} - x$

    (b) The product of two consecutive odd numbers is 143, find the two numbers.

## SECTION B (40 MARKS)

Answer all questions

11. The scores of Basic Mathematics test of 60 students of Chigongwe secondary school were recorded as follows;

Class interval	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69
Frequency	7	10	8	9	5	2	8	5	4	2

   (i) Find the mode and mean
   (ii) Draw the cumulative frequency curve (Ogive) and use it to estimate the median.
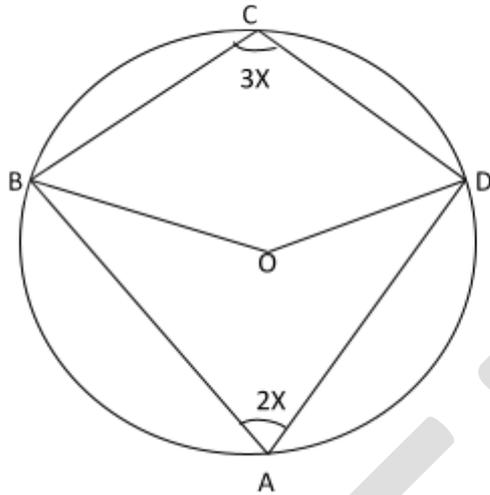
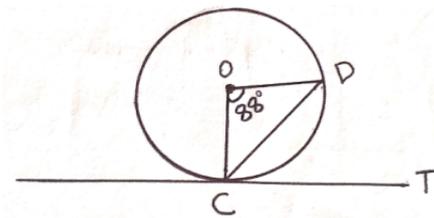12. The figure below shows a rectangular prism in which AB=12cm, BC=10cm and QC=5cm;

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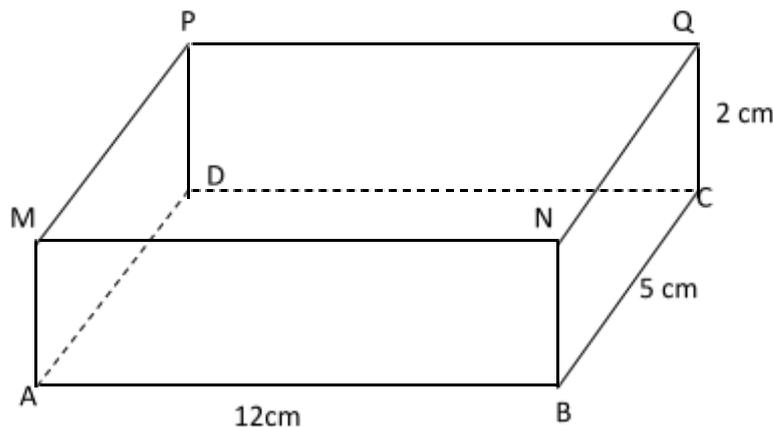
Calculate;

    (i)   Its total surface area

    (ii)   The angle between PB and the plain ABCD

    (iii)   The volume in litres the prism can hold (1 litre=1000cm³)

13. (a) If O is the centre of a circle, find the value of x

(b) In the diagram O is the centre of the circle. If m<COD = 88⁰, find m<TCD.

14. Given that $f(x) = \{x + 2 \ for \ x < 0 \quad 2 \quad for \ 0 \leq x \leq 2 \quad x^2 \quad for \ x > 2$

    (a) Draw the graph of $f(x)$

    (b) State the domain and range of $f(x)$

    (c) Calculate the value of *f(1)* and *f(-1)*