041

THE UNITED REPUBLIC OF TANZANIA

PREDICTION OF YOUR NATIONAL EXAM

BASIC MATHEMATICS

FORM FOUR

Time : 3HOURS

Instructions

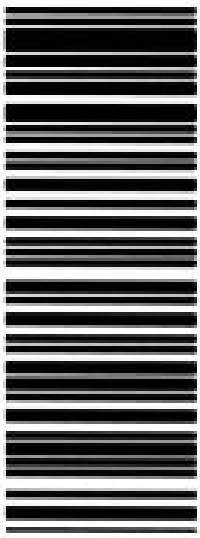
1.This paper consists of section A and B with total of **fourteen (14)** questions

2. Answer **ALL** questions

3. Each question in section A carries **six (6)** marks while each question in section B carries **ten (10)** marks

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

5. Write your **Examination Number** on every page of your answer booklet(s)



SECTION A **(60marks)**

Answer **ALL** questions in this section

1 (a) Two thousands four hundred Tanzanian shillings are deposited in s bank account each month .How much money will be deposited after two years?

(b) Ditto scored 55 out of 80 marks in Basis Mathematics test. What is score in percentage?

2 (a) Find the value of X , if $(\log_2 X)(-3+\log_2 X) = 4$

(b) Solve the equation $3^{(2y+1)} + 2\times3^{(y+1)} = 1$

3 (a) Every woman in a certain club own either Landlover or Nissan Patrol .If 23 women own Landlover , 14 own Nissan Patrol and 5 own both Landlover and Nissan Patrol, how many women are there in a club?

(b) A student picked a pair of socks out of his drawer without looking in it. If he has 3 pairs of black socks , 4 pair of brown socks, 3 pairs of black sport socks , 5 pairs of white sport socks .Find the probability that the student will pick a pair of black socks or a pair of sport socks.

4. (a) Find the equation of a straight line in the form of ax+by+c=0 passing through the point (-5,3) and the midpoint of the line joining the points (-2, 4) and (-6, 8).

(b) Two forces acting on a particle having magnitudes 8N and 3N . The angle between their direction is 60°. Find

i. The resultant force acting on a particle

ii. Magnitude of the resultant force acting on a particle

iii. Direction of resultant force

5. (a) The ratio of the areas of two similar polygons is 50:72 .If the length of a side of the smaller polygon is 12cm , find the length of the corresponding side of the larger polygon

(b) Find the radius of a circle which is inscribes a regular hexagon with perimeter 120cm

6 (a) A student had two plant seedlings. She measured the rate at which seedlings were growing. Seedling A grew 5cm in9 days and seedling B grew 8cm in 12days . Which seedling was growing more quickly?

(b) The expression $\frac{y}{a} - 4$ varies directly as the square of $\frac{1}{ax}$ if the constant of variation is 108 when x=3, and y=16. Find the value of a.

7 (a) Ali bought a goat forTsh 75,000/= after slaughtering it, he obtained 16kg of meat which he sold at Tsh 6000/= per kg.

i.Find this profit in percentage.

ii. Ali shared the profit with his young brother in the ratio 3:1. How much did each of them get?

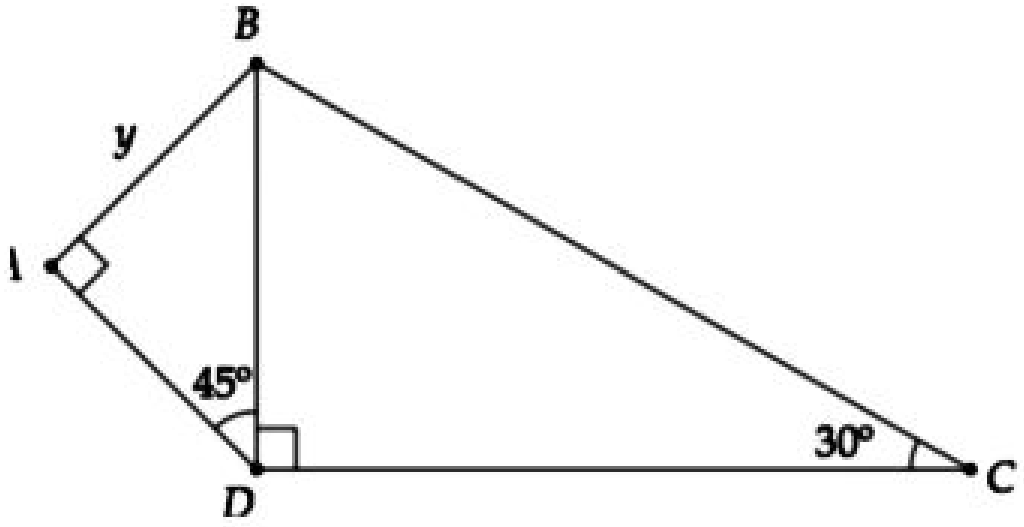
(b) Use the following information to prepare an income statement for the year ended 31st December 2021

Gross profit	Tsh 880,000
Electricity.	Tsh 220,000
Printing.	Tsh 360,000
General expenses.	Tsh 290,000
Salary.	Tsh 340,000
Interest received.	Tsh 120,000

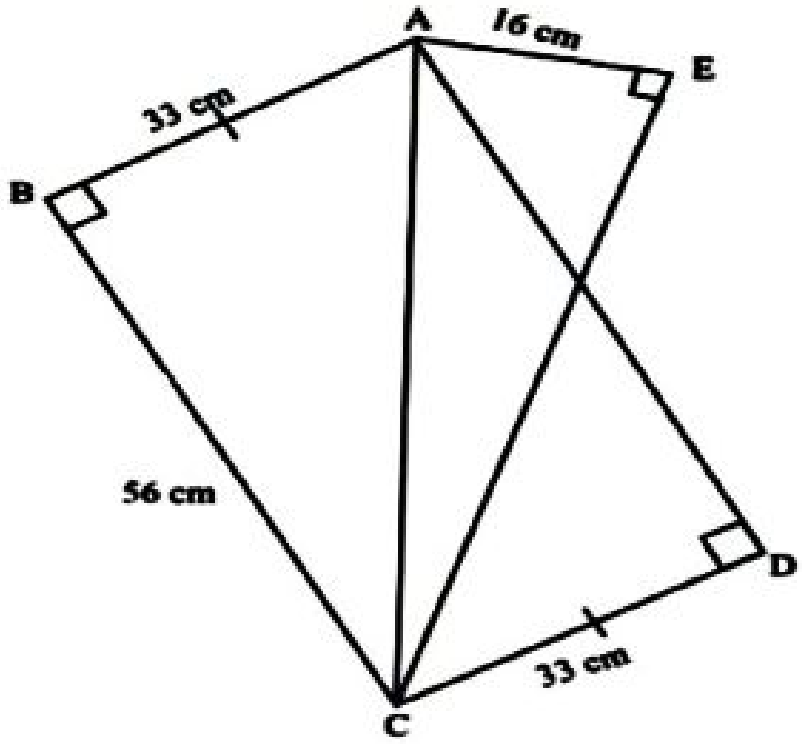
8. (a) The numbers 24, m,y,72 are such that m is arithmetic mean of 24 and y, while y is arithmetic mean of m and 72. Find the values of m and y

(b) The fourth ,fifth and sixth term of geometric progression is (2x+10), (4x-4) and (8x+40) respectively. Find the sum of first eight terms

9 (a) Find the length marked y in four significant figure



(b) In the following figure below calculate length AC, AD and EC



10 (a) Given that one of the roots of the equation $2X^2+K(X+1)+3=0$ is 4, find the value of K

(b) A piece of copper wire which is 56 cm long is bent to form a rectangle of area 171 cm^2 .Find the length and width of this triangle

SECTION B:(**40 marks**)

11. Mass of 45 athletes were recorded in kilograms as shown in the table below

Mass (kg)	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 -69
Frequency	7	8	11	10	4	5

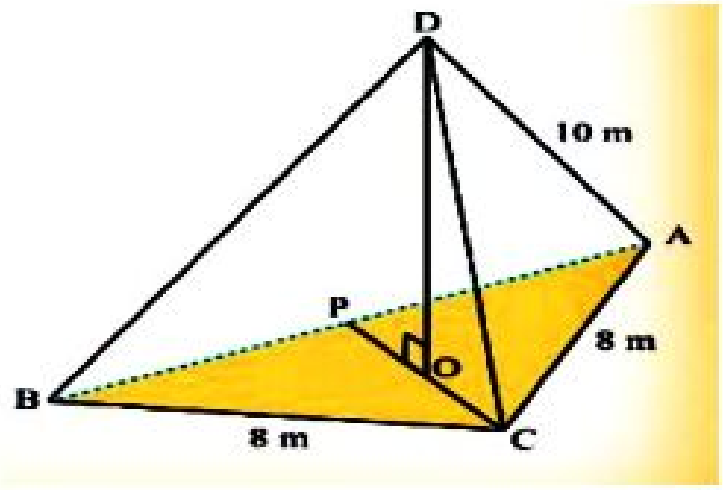
(a) By using histogram estimate most occurred weight in kilogram

(b)Calculate mean weight (in kilogram) given assumed mean is 52

(c) Calculate difference between actual mean and median, hence comment on difference obtained

12 (a) A speedboat traveling from Zanzibar (6°S , 45°E) to Mtwara (9°S , 45°E)using 30knots left Zanzibar at 11:30 a.m. At what time did it reach Mtwara?

(b) In the following figure ABCD is a right triangular pyramid with the base ABC which is an equilateral triangle . If AB= BC= CA=8 cm and DA = DB = DC=10 cm



Calculate

i.The height DO of the pyramid

ii. The angle which BD makes with the plane ABC

13 (a) Given matrices A = $\begin{pmatrix} 2 & 3 \\ 1 & -4 \end{pmatrix}$ B= $\begin{pmatrix} -4 & 2 \\ 3 & 5 \end{pmatrix}$

Find BA +A^2B

(b) Use crammer's method to solve the following simultaneously equation

$2x+3y+6=0$

$x-2y=11$

(c) Find the image of an object (5,-6) under rotation 180° clockwise followed by reflection in the line $y=-x$

14 (a) The function 'f' is defined as

$$f(x)=\begin{cases} 1 \text{ when } X\leq -4 \\ x^2-x-6 \text{ when } -4<x\leq 4 \\ 2x-3 \text{ when } x\geq 4 \end{cases}$$

i.Sketch the graph of function

ii.Use the graph to determine domain and range

(b)An automobile manufacturer makes cars and trucks in a factory that is divided up into two different shops. The first shop, which does the basic assembly, needs 5 worker-days per truck and 2 worker days per car. The second shop, which does the finishing touches, needs 3 worker-days for both cars and trucks. The first shop has 180 worker-days available per week and the second shop has 135 worker-days available. The profit per car is $500 and the profit per truck is $700. How many of each type should be produced in order to maximize profit? What is the maximum profit?