SMZ

ZANZIBAR EXAMINATIONS COUNCIL

FORM ONE ENTRANCE EXAMINATION

130 **MATHEMATICS**

TIME: 2.00 HOURS **SOLUTIONS** **SUNDAY 20TH NOVEMBER, 2021 A.M**

INSTRUCTIONS TO CANDIDATES

1. **This paper consists of FOUR (4) sections A, B, C and D.**
2. **Answer ALL questions in section A and B. Choose ONE (1) question from section C and ONE (1) question from section D.**
3. **Write your examination number on each page.**
4. **Write all answers in the space provided.**
5. **Use a blue or black pen in writing.**
6. **Cellular phones and unauthorized materials are not allowed in the examination room.**

FOR EXAMINER'S USE ONLY

QUESTION NUMBER	MARKS	SIGNATURE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
JUMLA		

SECTION A (60 Marks)
Answer ALL questions in this section.

1. (a) What is the meaning of the word “place value”?
   (b) Write the place value of digit in the number .

   (a) The place value of a digit is the value it has because of its position in a number. For example, in the number 4,582, the digit 5 is in the hundreds place, so its place value is 5 × 100 = 500.

   (b) Since the number is not clearly visible in the scanned paper, the method used is shown. Identify the position of the given digit, then multiply the digit by the value of its position. For example, if the digit is 7 in the thousands place, its place value is 7 × 1000 = 7000.

2. (a) There are two numbers whose sum is 72. One number is twice the other. What are the numbers?
   (b) If m = 3 and n = 4 and z = 5, calculate th value of m/n + z/n

   (a) Let the smaller number be x. The other number is 2x.
   x + 2x = 72
   3x = 72
   x = 72 ÷ 3
   x = 24
   The other number = 2 × 24 = 48
   The two numbers are 24 and 48.

   (b) m/n + z/n = 3/2 + 5/4 = 2 3/4

3. Read the prices list and answer the following question.
   One Bread = Sh. 500
   One Butter = Sh. 2,500
   One packet Rice = Sh. 17,000
   One bottle of cooking oil = Sh. 32,000

   Juma bought 6 breads, 3 packets of butter, 4 bottles of cooking oil and 6 packets of rice and remained sh. 4,600 after buying. How much money did he have in the beginning?

   Cost of bread = 6 × 500 = 3,000
   Cost of butter = 3 × 2,500 = 7,500
   Cost of cooking oil = 4 × 32,000 = 128,000
   Cost of rice = 6 × 17,000 = 102,000

   Total spent = 3,000 + 7,500 + 128,000 + 102,000
   Total spent = 240,500

   Money he had at first = total spent + remaining money
   Money at first = 240,500 + 4,600
   Money at first = 245,100 shillings

4. (a) Calculate the value of y if y:15 = 300:1
   (b) Express 5703_{10} to base 3

   (a) Calculate the value of y, if y : 15 = 300 : 1

y / 15 = 300 / 1

y = 15 × 300

y = 4500

(b) Express 5703_{10} to base 3.

5703 ÷ 3 = 1901 r 0

1901 ÷ 3 = 633 r 2

633 ÷ 3 = 211 r 0

211 ÷ 3 = 70 r 1

70 ÷ 3 = 23 r 1

23 ÷ 3 = 7 r 2

7 ÷ 3 = 2 r 1

2 ÷ 3 = 0 r 2

Reading remainders from bottom to top:

$5703_{10} = 21211020_3$

5. (a) Calculate the prime factors of 132.

132
= 2 × 66
= 2 × 2 × 33
= 2 × 2 × 3 × 11

Prime factors of 132 = **$2^2 \times 3 \times 11$**

5. (b) Calculate the value of x in the following equation.
x/2 + 8 = 12

x/2 = 12 − 8
x/2 = 4
x = 8

6. Simplify

   6/7 × 2/3 + 12/21 ÷ 3/7

   6/7 × 2/3 = 12/21 = 4/7

   12/21 ÷ 3/7
   = 12/21 × 7/3
   = 4/3

   4/7 + 4/3

   LCM of 7 and 3 = 21

   4/7 = 12/21
   4/3 = 28/21

   12/21 + 28/21
   = 40/21

   Answer = **40/21**

7. In the figure below, length AB = length AC and angle BAC = 20°.

   (a) Calculate the value of the angle ABC.

   AB = AC, triangle is isosceles

   Angle A = 20°

   Angle B = Angle C

   Angle B + Angle C + 20° = 180°
   2Angle B = 160°
   Angle B = **80°**

   (b) Calculate the value of the angle ACD.

   Angle ACB = 80°

   ACD is an exterior angle on a straight line

   Angle ACB + Angle ACD = 180°
   80° + Angle ACD = 180°
   Angle ACD = **100°**

8. (a) Compute 3.2(25.3 + 5.7).

25.3 + 5.7 = 31.0

3.2 × 31.0 = **99.2**

(b) Convert sh. 675,800 into US dollar. (1 US dollar = sh. 2,300).

675,800 ÷ 2,300 = **294.26 USD**

9. (a) Convert 26 tonnes into grams.

1 tonne = 1,000 kg

1 kg = 1,000 g

26 tonnes

= 26 × 1,000 × 1,000

= **26,000,000 g**

(b) 30% of Ali's salary is sh. 150,000. Calculate his salary.

30% = 30/100

30/100 × Salary = 150,000

Salary = 150,000 × 100 ÷ 30

Salary = **500,000 sh**

SECTION B (40 Marks)

10. (a) Calculate the perimeter of the figure below.

Perimeter = sum of all outer sides

Top horizontal = 5 cm

Vertical down = 3 cm

Horizontal left = 2 cm

Slanted left = 8 cm

Slanted right = 8 cm

Horizontal right = 2 cm

Vertical up = 3 cm

Perimeter

= 5 + 3 + 2 + 8 + 8 + 2 + 3

= **31 cm**

(b) A diesel storage tank has circular base of 14 m diameter. If the height of the tank is 12 m, calculate the volume of diesel that tank can hold. (Use π = 22/7).

Radius r = 14 ÷ 2 = 7 m

Volume = $\pi r^2 h$

= 22/7 × 7 × 7 × 12
= 22 × 7 × 12
= **1,848 m³**

11. (a) How many mango trees can be planted in rectangular garden 180 m by 120 m allowing each tree an area of 60 m²?

Area of garden
= 180 × 120
= 21,600 m²

Number of trees
= 21,600 ÷ 60
= **360 trees**

(b) Convert 20000 mm into
(i) Kilometres
(ii) Centimetres

1 m = 1,000 mm
1 km = 1,000 m

20000 mm
= 20000 ÷ 1000 m
= 20 m

(i) Kilometres
20 m ÷ 1000
= **0.02 km**

(ii) Centimetres

1 cm = 10 mm

20000 mm ÷ 10
= **2000 cm**

12. (a) Evaluate $\sqrt[3]{(1/125)}$

1/125

= $1/(5^3)$

$\sqrt[3]{(1/125)}$

= 1/5

Answer = **1/5**

(b) The following table shows the masses in kg of 16 students.

Mass in kg: 40, 50, 60

Number of students: 7, 5, 4

Total mass

= (40 × 7) + (50 × 5) + (60 × 4)

= 280 + 250 + 240

= 770 kg

Total number of students

= 7 + 5 + 4

= 16

Average mass

= 770 ÷ 16

= **48.125 kg**

13. (a) Simplify the expression

(18a + 12b + 15)/4 + (22a − 4b − 7)/4

Same denominator 4

= (18a + 12b + 15 + 22a − 4b − 7)/4

= (40a + 8b + 8)/4

Divide each term by 4

= 10a + 2b + 2

(b) If y is inversely proportional to x when y = 2, x = 3. Calculate

Since $y \propto 1/x$

y = k/x

Substitute y = 2, x = 3

2 = k/3

k = 6

So y = 6/x

(i) x when y = 12

12 = 6/x

x = 6/12

x = **1/2**

(ii) y when x = 6

y = 6/6

y = **1**

14. Use the circle of centre E below to answer the following questions.

(a) Name the part of the circle label FG.

FG is a **chord**

(b) Write the name of the line AB and EC.

AB is a **diameter**

EC is a **radius**

(c) Explain the relationship between lines AB and EC.

AB is a diameter, EC is a radius

Diameter = 2 × radius

(d) If length of line EC is 3 cm, calculate the value of the length of the line AB.

EC = radius = 3 cm

AB = 2 × EC

AB = 2 × 3

AB = **6 cm**

15. (a) A science book was bought at sh. 12,000 and sold at sh. 6,000. Calculate the percentage loss.

Loss

= Cost price − Selling price

= 12,000 − 6,000

= 6,000

Percentage loss

= Loss / Cost price × 100

= 6,000 / 12,000 × 100

= 1/2 × 100

= **50%**

15. (b) For how long should sh. 6,000,000 be invested at simple rate of 4% to get an interest of sh. 480,000?

I = PRT

480,000 = 6,000,000 × 4/100 × t

480,000 = 240,000t

t = 480,000 ÷ 240,000

t = **2 years**

16. The following table shows juice packets produced by certain small scale factory.

Time in hours: 1, 2, 3, 4, 5

Number of juice packets: 60, 120, 180, 240, 300

(a) Draw the line graph on graph paper to represent the data.

Plot the points:

(1, 60), (2, 120), (3, 180), (4, 240), (5, 300)

Join the points with straight lines.

(b) From the graph read:

(i) Number of juice packets produced in 2 hour and 30 minutes.

2 hours 30 minutes = 2.5 hours

Production rate

= 60 packets per hour

Packets in 2.5 hours

= 60 × 2.5

= **150 packets**

(ii) Number of hours taken to produce 270 juice packets.

Production rate

= 60 packets per hour

Time

= 270 ÷ 60

= 4.5 hours

4.5 hours = **4 hours 30 minutes**