MATHEMATICS

Date: 21/ 06/2022
Period: 8:30-11:30

END OF TERM III EXAMINATIONS

GRADE   **SENIOR ONE**
OPTION   **ORDINARY LEVEL**

DURATION: **3HOURS**

MARKS: **100**

INSTRUCTIONS

1)This paper consists of **one** section

   Section A: Attempt **all** questions.   **(100marks)**

2)You may use mathematical instruments and a calculator **where necessary.**

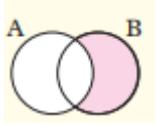3)Use a **blue or black ink pen only** to write your answers and a **pencil** to draw diagrams.

4)Show clearly all the working steps. **Marks will not be awarded for the answer without all working steps.**

Section A: Answer all questions (100marks)

1) Choose the correct answer.   (2marks)

The shaded region in the Venn diagram represents

    a) A' U B
    b) A ∩ B'
    c) A'∩ B

2.Given the sets P = {1, 2, 3, 4, 5, 6} and Q = {2, 4, 7, 8}, find:

(a) P ∩ Q   (1marks)

(b) P∪Q   (2marks)

(c) n(P ∩ Q)   (1mark)

3)Given that, $y = \dfrac{k}{k+w}$. Find the value of y when $k = \dfrac{1}{2}$ and $w = \dfrac{1}{3}$.

        (3marks)

4)At a department in a university, 100 students were enrolled. 38 took Mathematics, 20 took Economics and 3 took both Mathematics and Economics.

 a) Represent this information using the Venn diagram   (3marks)

 b) Find the number of students took none of the subjects? **(2marks)**

(b) How many students at least took Maths or Economics?   (2marks)

5) Given that $\frac{3}{n} = 5$, find the value of n =? **(2marks)**

6) A number is such that when 3 is subtracted from three-quarters of it, the result is two thirds of the number. Find the number.

(3marks)

7) A dealer sold 1 000 bottles of water at 140FRW each, to clear the stock. Determine the profit or loss did she incur if she had bought one bottle at175FRW   (3marks)

8) If 720 000 FRW is invested for 9 months at an annual simple interest rate of 15%.

(a) How much interest will earned? **(2marks)**

(b) What is the amount of investment after 9 months? **(2marks)**

9) A train is travelling at a speed of 30km per hour. How long will it take to travel 500m? **(3marks)**

10) Adjacent angles in a parallelogram are x^0 and $3x^0$. Find the smallest angles in the parallelogram. **(2marks)**

11) Three angles of a triangle are 25^0, 75^0, and p^0. Find the value of p.

(2marks)

12) State the properties of a cube. **(2marks)**

13) Find the volume of a cylindrical container whose diameter is 7.9 cm if its height is 7cm. Use π = 3.14 and give your answer in 3 significant figures.**(3marks)**

14) Define the following statistical terms

i)Continuous data   (1marks)

ii) Qualitative data   (1marks)

b) Fill the gaps by **certain** or **uncertain** event

    i) An event that cannot take place is known as.........   (1mark)
    ii) An event that can take place is known as........   (1mark)

15.The table below shows the heights (in cm) of trees in a certain garden:

Heights(cm)	25	50	75	100	125	150
Number of trees	7	10	5	2	1	0

    a) What is the mode height?   (**1mark**)
    b) Show the information above on Bar chart. **(3marks)**
    c) How many trees are in the garden   **(2marks)**

END

CASS MATHEMATICS SENIOR ONE ,2022 MARKING SCHEME

ANSWER 1   **2marks**

b) A ∩ B'

Answer 2

(a) P ∩ Q={2,4}   **1marks**

(b)   P∪Q={1, 2, 3, 4, 5, 6,7,8}   **1mark**
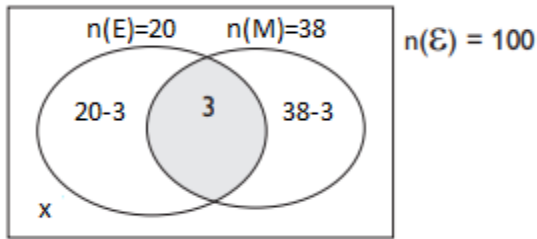
(c) n(P ∩ Q)=2   **1mark**

Answer 3

$$y = \frac{\frac{1}{2}}{\frac{1}{2}+\frac{1}{3}} = \frac{\frac{1}{2}}{\frac{3+2}{6}} = \frac{\frac{1}{2}}{\frac{5}{6}} = \frac{1}{2} \times \frac{6}{5} = \frac{3}{5}$$

0.5Mark for each step and 1mark for last step.

Answer 4

a) Let

- x representsstudents took none of the subject.
- εRepresentsstudents in the university.
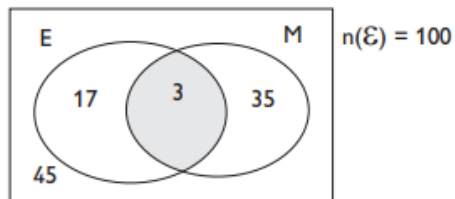- M represents students took Mathematics.
- Erepresentsstudents took Economics

3marks

X+17+3+35=100 **2mark**

X=100-55**1mark**

X=45**2marks**

The Venn diagram is

2marks

(b)17+3+35=58   2**marks**

Answer 6

Let x be that number: $\frac{3x}{4} - 3 = \frac{2x}{3}$ **0.5marks**

$\frac{3x-12}{4} = \frac{2x}{3}$ (cross multiplication) **0.5mark**

(3x-12)*3=4*2x   **0.5mark**

9x-36 = 8x   **0.5mark**

9x-8x=36   **0.5mark**

X= 36   **0.5mark**

Answer 7

Buying price= 175 FRW,   0.5**mark**

selling price= 140 FRW**0.5mark**

This means she made a loss

Loss=Buyingprice–sellingprice**0.5mark**

(175–140)FRW=35FRWperbottle.**0.5mark**

Totalloss=35 FRW× 1000………………**0.5mark**

=35000FRW………………………**0.5mark**

Answer 8a) $I = \frac{P*R*T}{100*12}$

0.5**mark**

$= \frac{720000*15*9}{100*12}$**0.5mark**

= 81000Frw   **1mark**

b)Amount of investment after 9 months= I+P   **1mark**

= 81000Frw + 720000Frw

0.5mark

= 801000 Frw   **0.5mark**

Answer 9

30km=30,000m   **0.5mark**

1h=60min   **0.5mark**

By using proportion property:

$30000 : 60 = 500 : x$**0.5mark**

$\frac{30000}{60} = \frac{500}{x}$**0.5mark**

$30000x = 500 \times 60$

$x = \frac{30000}{30000}$ 0.5*mark*

$x = 1$ **0.5mark**

Therefore, it will take 1minute to travel 500m

Answer 10

Adjacent angles add up to 180^0**0.5mark**

$x^0 + 3x^0 = 180^0$**0.5mark**

$4x^0 = 180^0$**0.5mark**

$x^0 = 45^0$

Therefore, the smallest angles are acute angles, which are 45^0.

0.5mark

Answer 11

Angles of a triangle are (supplementary) add up to 180^0

$25^0 + 75^0 + p^0 = 180^0$**1mark**

$p = 80^0$**1mark**

Answer 12

A cube is a special type of cuboid that has

- six identical faces   **1mark**
- 8 vertices   **0.5mark**
- 12 equal edges.   **0.5mark**

Answer 13

Volume of cylinder = $\pi r^2 h$ **1mark**

        = (3.14 × 3.952 × 7) cm³**1mark**

          = 342.9 cm³ = 343 cm³**1mark**

Answer 14 a

a.i)Continuous data is the type of data that may take all values within a given range. **1mark**

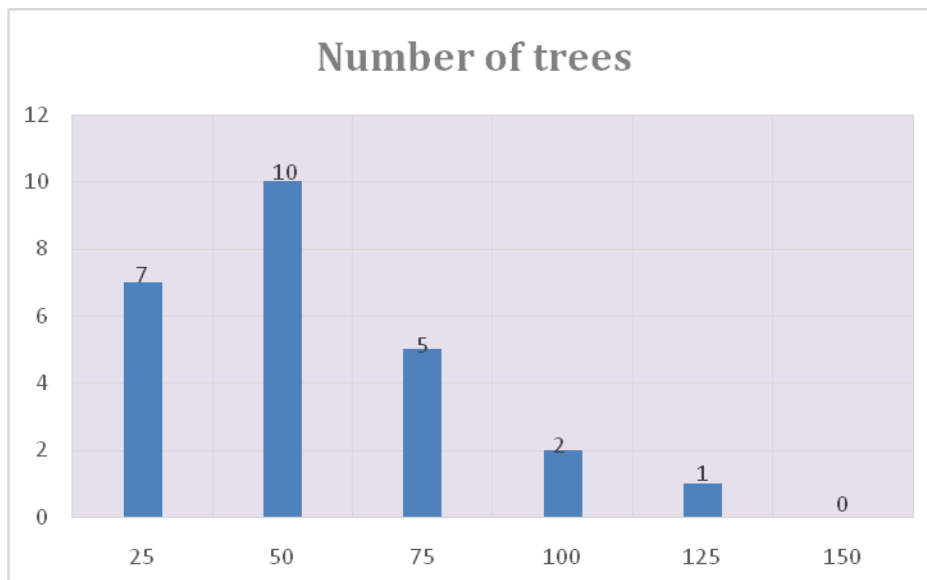ii)Qualitative data is type of data whose numerical value cannot be measured. **1mark**

b)

      i)   An event that cannot take place is known as **uncertain event.**
                                                        1mark

      ii)   An event that can take place is known as **sure or certain event.**

Answer 15)

    a) The mode height is 50...**1mark**
    b) The Bar chart

c) There are
    7+10+5+2+1+0=25trees

END