



**MACHAKOS UNIVERSITY**

**SCHOOL PURE AND APPLIED SCIENCES**

**DEPARTMENT OF MATHEMATICS AND STATISTICS**

**SECOND SEMESTER EXAMINATION FOR DIPLOMA IN FOOD AND BEVERAGE MANAGEMENT.**

**MATHEMATICS**

Instructions

Answer all the questions

Show all the working clearly

Question one

a) Solve the following equations

i)  $\frac{4x-5}{2} - \frac{2x-1}{6} = x$

ii)  $1.2x - 1.8y + 21 = 0$   
 $2.5x + 0.6y = 65$

iii)  $6x^2 - 5x + 1 = 0$  (15 marks)

b) Simplify;

i)  $x - (2 - x) - (x + 4)$

ii)  $\frac{10}{x} \left( \frac{x^2}{5} + \frac{x}{2} \right) - x$  (5 marks)

Question two

- a) A certain sum of money is divided in the ratio  $1\frac{1}{2} : 2\frac{1}{3} : 3\frac{1}{4}$ . If the largest share is shs 156, what is the sum divided? (8 marks)
- b) A hall is 15m long, 8m wide and 4m high. The door and the windows occupy  $14\text{m}^2$ . The walls are to be painted. Find the cost of painting them at sh 75 per square meter. (6 marks)
- c) A whole number is selected at random from those numbers between 11 and 35 inclusive. Find the probability that it is (8 marks)
- A prime number
  - Greater than 17
  - Divisible by 3
  - A multiple of 8

Question three

- a) Given the following data 72, 28, 12, 17, 85, 11, 14, 10, 12, 15, 22, 31, 42, 83,61.

Determine:

- i) The range
  - ii) The interquartile range
  - b) Height(cm)                      frequency
- |         |    |
|---------|----|
| 150-157 | 5  |
| 158-165 | 18 |
| 166-173 | 42 |
| 174-181 | 27 |
| 182-189 | 8  |

use the data above to calculate

- i) the mean and the standard deviation (use a working mean of 169.5)
- ii) the median height (13marks)

question four.

- a) A metal solid cylinder, diameter 1m 10cm and of height 28cm, is melted and recast into 200solid cubes. Find the length of the edge of one of the cubes (take  $\pi= 22/7$ ) 6marks.
- b) The mean of n numbers is 15. If the same numbers, together with 20, have a mean of 16, find the value of n (6marks).
- c) The distribution of teaching hours in a 40hour week in a college was given as below

Subject	mathematics	Applied sciences	English	Practical's
hours	8	12	8	12

Draw a pie chart to represents the information in the table above.

Question five

- a) The volume (v) of a sphere is proportional to the cube of its radius ( R). if  $v=24.8$  when  $R=2$  find
    - i) The value of v when  $R=3$
    - ii) An expression for R in terms of v (4 marks)
  - b) Given that y varies inversely as x and  $y=x=2$ , find
    - i) Y when  $x=6$
    - ii) X when  $y=1\frac{1}{3}$  (4 marks)
  - C i) Draw the graph of  $y=x^2-3x+2$ , for values of x between -1and4
- Use the graph in ( i) to solve the following equations, (12 marks)

$$X^2 - 3x + 2 = 0$$

$$X^2 - 3x + 1 = 0$$

$$X^2 - 4x = 0$$