

**W1-2-60-1-6**

## JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

**UNIVERSITY EXAMINATIONS 2020/2021**

**EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MEDICAL LAB SERVICES**

**MLS 2100: MATHEMATICS FOR MEDICAL SCIENCE**

**DATE: JANUARY 2021 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER ALL QUESTIONS IN SECTION A AND B. CHOOSE ONE QUESTION IN SECTION C**

**SECTION A: (20 MARKS)**

1) Solve for x if log (x+5) + log (x+5)=2

(A) -4 (B) 10 (C) 5 (D) -3

2) Let ~~Z~~=3+4i, determine |~~Z~~|

(A) -5i (B) 5 (C) 5i (D) 7i

3) Given that, find y when x=90.

(A)  (B)  (C)  (D) 

4) Determine the remainder of the Algebraic division 

(A) 9 (B) 6 (C) 8 (D) 0

5) Given the data below compute the Quartile deviation 5,10,8,6,1,2,3,4,9,7

(A) 3 (B) 5.5 (C) 8 (D) 5

6) Let ~~Z~~ =1-i, determine arg ~~Z~~

(A)  (B) 2 (C) 1350 (D) 315

7) Determine the value of when x=1 if 

(A) 3 (B) 9 (C) 11 (D) 8

8) Simplify (5½)-1

(A)  (B)  (C)  (D) 

9) The roots of a quadratic equation 2x2+5x+4=0 are m and n. Determine the value of m2+n2

(A)  (B)  (C)  (D) 

10) State the number of permutations of all the letters in the word

LABORATORY

1.  (B)  (C)  (D) 

11) Given that nc2=45, find n.

(A) 10 (B) 90 (C) 9 (D) 22.5

12) Compute the mode of the set of numbers 2.1, 1.2, 1.2, 8.1, 1.2, 2.1, 1.2, 2.1

(A) 2.1 (B) 1.2 (C) 8.1 (D) 12

13) If , find if x=0

(A) 1 (B) x (C) 0 (D) e

14) Given that , find if 

(A) 2 (B) 1 (C)  (D) -1

15) What is the remainder when 3x3+4x2+2x+1 is divided by x+1

(A) 0 (B) 10 (C) 4 (D) 2

16) Solve the equation 2x2+32=0

(A) 4 (B) -16 (C) -4i (D) 16i

17) Given the data below 2,6,12,12,7,8,12,3,14,5,19,7. Compute the median.

(A) 12 (B) 7.5 (C) 8 (D) 7

18) Evaluate 

(A) 99 (B) 100 (C) 101 (D) 10,100

19) Evaluate 

(A) 12 (B) 20 (C) 8 (D) 4

20) Find value of 

(A)  (B)  (C)  (D) 

**SECTION B: (30 MARKS) Answer ALL Questions in this Section**

21) Solve the equation ~~Z~~4=-16 and show the roots in an argand diagram (6 marks)

22) State the remainder theorem and hence determine the remainder of the algebraic division verify your result using synthetic division (6 marks)

23) A committee of 5 is to be formed from 12 men and 9 women. In how many ways can the committee be selected if there must be more men than women (6 marks)

24) Given that , find

a) when x=3 (3 marks)

b)  (3 marks)

25) Given that the root of the quadratic equation are and, determine values of

1.  (2 marks)
2.  (2 marks)
3.  (2 marks)

**SECTION C: (20 MARKS) Answer Any ONE Question**

26) A laboratory is testing the growth rate of a certain bacteriological culture. The total surface area of 50 cultures are measured and tabulated after two days as shown in the table below.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Surface  area (mm)2 | 1.0-1.4 | 1.5-1.9 | 2.0-2.4 | 2.5-2.9 | 3.0-3.4 | 3.5-3.9 | 4.0-4.4 |
| Frequency | 4 | M | 7 | 14 | 10 | 6 | 3 |

Calculate:

1. the value of M (2 marks)
2. the mode of the distributive (4 marks)
3. the mean surface area (4 marks)
4. the standard deviation (5 marks)
5. the Quartile deviation (5 marks)

27a) Given that ~~Z~~1=2+3i and ~~Z~~2=4-3i (8 marks)

Evaluate

(i) ~~Z~~1~~Z~~2

(ii) 

(iii) 

b) Solve the equation

(i) x2+9i=0 (4 marks)

(ii) x2+4x+5=0 (4 marks)

28) Draw the graph of the curve y=3 sin (3x+10) for 0 . Give the interval of 150. Use your graph to solve the equation (8 marks)

1. 3 sin (3x+10)=0 (4 marks)
2. Sin (3x+10)= (4 marks)
3. 3 sin (3x+10)+½=0 (4 marks)