MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
FIRST YEAR FIRST SEMESTER
2019/2020 ACADEMIC YEAR

SCHOOL OF ARTS AND SOCIAL SCIENCES
DIPLOMA IN SOCIAL WORK

COURSE CODE: DSS 1101
COURSE TITLE : QUANTITATIVE TECHNIQUES

DATE : 9TH DECEMBER 2019 **TIME: 8.30 A.M. – 10.30 A.M**

INSTRUCTIONS TO CANDIDATES

Answer question one and any other three questions

Question One

a) Define the following:

i) Permutation

ii) Combination

iii) Income Tax (3 marks)

b) Mary deposited Sh. 458,000 in a bank offering a simple interest of 10% per annum. Determine the:

i) Accrued amount after 8 years (3 marks)

ii) Time it will take for an accrued amount of Sh. 800,000. (3 marks)

c) Given that x = 14, y = 5, z = -1, evaluate (3 marks)

$$\left(x^2+y\right)^3-\left(y^2-z^3\right)^2$$

d) Dan invested Sh. 98,000 in a bank offering a compound interest of 15% per annum. Determine the:

i) Amount accrued after 20 years. (3 marks)

ii) Time it will take for an accrued amount of Sh. 140,000. (4 marks)

e) Determine the values of k that makes the following equations perfect square: (6 marks)

i) $2x^2-kx+8$

ii) $3x^2+3x+k$

Question two

Given that set $\Omega=\{1,2,3,4,6,8,9,12\}$, $A=\{1,2,3,4,6\}$, $B=\{6,8,9,12\}$ and $C=\{1,2,3,4\}$.

a) Giving reasons state the set which is a subset of A (2 marks)

b) Determine the following

i. A^C (1 marks)

ii. $A\cap B$ (2 marks)

iii. $B-A$ (2 marks)

iv. $A\cup B$ (2 marks)

v. $A\cap C$ (2 marks)

c) Show that Ω is partitioned by B and C (4 marks)

Question three

The data below illustrate the number of vehicles that passed over a bridge in 60 days, use it to answer the questions that follows;

12	13	14	15	10	9	11	15	13	9
11	10	10	12	13	11	10	9	11	12
12	15	15	14	13	13	15	15	12	11
9	9	11	12	13	14	12	13	12	12
10	10	10	11	12	13	15	14	13	14
9	10	11	12	11	9	9	12	13	10

i. Tabulate the data into a discrete frequency distribution (4 marks)

ii. Using the discrete frequency distribution calculate

a) Mean of the dataset (3 marks)

b) The median (3 marks)

c) Mode (1 mark)

d) Standard deviation (4 marks)

Question four

a. Define the following terms as used in sequence and series

i) Arithmetic Process (2 marks)

ii) N^{th} term (1 mark)

b. Find the sum of the n terms in the brackets of the following series

i) $-2,1,4,7...$ (first 20 terms) (3 marks)

ii) $\frac{1}{16},\frac{1}{8},\frac{1}{4},\frac{1}{2},...$ (first 15 terms) (3 marks)

iii) $5,10,15,...$ (first 20 terms) (3 marks)

iv) $2,6,18,54,...$ (first 10 terms) (3 marks)

Question five

a) Solve the following equations:

i) $\frac{8-2x}{3}-\frac{7-x}{4}=10$ (3 marks)

ii) $2x^2+3x-14=0$ using factorization (3 marks)

iii) $7x^2-19x-5=0$ using quadratic formula (4 marks)

b) The marks scored by students in a C.A.T were recorded as follows:

Marks	5 – 9	10 - 14	15 – 19	20 – 24	25 - 29
Number of students	5	10	20	16	4

Draw a bar graph to represent this data. (5 marks)

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