CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

RESIT/SPECIAL EXAMINATION

EXAMINATION FOR THE AWARD OF CERTIFICATE IN

MATH 00101: FOUNDATION MATHEMATICS

STREAMS: CERTIFICATE **TIME: 2 HOURS**

DAY/DATE: TUESDAY 02/11/2021 **8.30 A.M – 10.30 A.M.**

QUESTION ONE (30 MARKS)

a) In an AP of 30 terms, 4^{th} term is 4, 22^{nd} term is 5. Find the sum of AP. (6 marks)

b) Obtain the remainder when $2x^3+x^2-6x+9$ is divided by $x-2$. (5 marks)

c) Suppose, a bag has 4 red balls and 6 blue balls. What is the probability of choosing 2 blue balls at random? (4 marks)

d) Find the expansion of $(2x-3y)^5$. (5 marks)

e) Solve the Quadratic equation by completing square method
$2x^2-2x+1=0$. (5 marks)

f) Simplify $\frac{cos^2\theta}{1+sin\theta}+\frac{cos^2\theta}{1-\sin\theta}$. (5 marks)

QUESTION TWO (20 MARKS)

a) From a group of 7 men and 6 women, 5 persons are to be selected to form a committee so that at least 3 men are there in the committee. In how many ways can this be done? (4marks)

b) Differentiate between primary data and secondary data and state three the methods of collection of each method. (7 marks)

c) Evaluate without using calculators $125^{2/3}$. (3 marks)

d) From a bag containing 5 white balls, 2 blue balls and 11 red balls. One ball is drawn at random. What is the probability that either blue or red ball is drawn? (6 marks)

QUESTION THREE (20 MARKS)

a) Write out the following series in full (4 marks)

$$\sum_{i=-2}^{3} (i^2 - 2)$$

b) The ages of the 112 people who live on a tropical island are grouped as follows.

Age	Number
0 – 9	20
10 – 19	21
20 – 29	23
30 – 39	16
40 – 49	11
50 – 59	10
60 – 69	7
70 – 79	3
80 – 89	1

Find mean, median, standard deviation and mode.

(10 marks)

c) I. $5x^2 = 10x - 4$ (quadratic formula).

II. $-3x^2 + 6x - 48 = 0$. (completing square method). (3 marks)

QUESTION FOUR (20 MARKS)

a) Evaluate without using calculators $log_3\left(\frac{1}{81}\right)$. (4 marks)

b) A bag contains 6 black balls and 4 white balls. John picks a ball at random from the bag and replaces it back in the bag. He mixes the balls in the bag and then picks another ball at random from the bag.

I. Construct a probability tree diagram of the problem.

II. Calculate the probability that John picks

i. Two black balls

ii. A black ball in his second draw. (8 marks)

c) Plot a graph of $y = sin\theta$ for $0° \leq \theta \leq 360°$ at an interval of 30° . (5 marks)

d) A GP has first term 5 and common ratio 2. Find the sum of the first 10 terms. (3 marks)
