CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF CERTIFICATE IN COMPUTER SCIENCE

MATH 00101: FOUNDATION MATHEMATICS

STREAMS:CERT **TIME: 2 HOURS**

DAY/DATE: MONDAY 4/12/2017 **11.30 A. M – 1.30 P.M**

INSTRUCTIONS:

- **Answer question one and any other two**

QUESTION ONE (30MARKS)

Define the following terms: [3marks]

(a) Mutually exclusive events

(ii) Descriptive statistics

(iii) Independent events

(b) Show that $\frac{2(3^{x+1})+7(3^{x-1})}{3^{x+2}-2(\frac{1}{3})^{1-x}} = 1$ [3marks]

(c) The floor of this exam room is 14 feet longer than it's width. The floor of the room has an area of 1632 square fee

ts.

(i) Write a quandrantic equation in terms of w. [1mark]

(ii) Find the width and length of the room. [2marks]

(d) obtain the reminder when $x^5 - 3x^2 + 2x - 24$ is divided by x -2,using the reminder theorem. [3marks]

(e) In a sample of 50 people 21 had type 0 blood, 22 had type A, 5 had type B and 2 had type AB. Set up a frequency distribution and find the probability that.

(i) A person has type 0 blood. [2marks]

(ii) A person has type A or type B [2marks]

(f) Solve for x given that

10^{4x+1}- 100^{x} = 0 [3marks]

(g) The data below represent the annual chocolate (sales in million dollars) for a sample of seven countries in the world 20,49,65,21,51,32,166. Determine

(i) Mean [2marks]

(ii) Standard deviation [3marks]

(h) Find the sum of the first 150 terms of the arithmetic sequence 5,16,27,38,49. [3marks]

(i) Three trees A,B and C in mt Kenya forest are such that AC = 10 kms < BAC = 40^0 and $< BCA = 30^0$. Calculate . [30marks]

(i) AB

(ii) BC

QUESTION TWO (20MARKS)

(a) The functions $3x^3$-$3x^2$ + bx +14 and x^2-7x -4 have the same reminder when divided by x-3. What is the value of b? Use any of the functions to confirm your answer using the long division method. [6marks]

(b) Solve the following using factorization method

$3x^2$ +3x – 60 =0 [4marks]

(c) Convert the following;

(i) 405^0 into radians [2marks]

(ii) $\left(\frac{2\pi}{5}\right)^c$ into degree [2marks]

(c) In a 6 questions marking test, how many different answers sheet are possible for no answer sheet can be used twice and there are. [6marks]

(i) 6 answer sheets are available

(ii) 7 answer sheets are available

(iii) 10 answer sheets are available

QUESTION THREE (20MARKS)

(a) Show that the roots of ax^2 + bx +c = 0 are given by

x= $-\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ where a ≠ 0 [5marks]

(b) Use the discriminant to determine the type of roots of the following equations. [4marks]

(i) $2x^2$-x -15 = 0

(ii) x^2+4x +13 = 0

(c) Peter has 5 friends, in how many ways can he invite at least 3 of his friends to his birth day party. [3marks]

(d) Solve the equation whose 2 sin^2x = sin x for the values of x from 0° to 360° inclusive. [3marks]

(e) How many terms at least of the AP 1,4,7,10……. Are needed to give a sum greater than 590 from the first term of AP. [5marks]

QUESTION FOUR

(a) Distinguish the following terms as used in statistical data collection. [4marks]

(i) Sampling and census

(ii) Primary data and secondary data

(b) The data below shows the frequency distribution table of masses (kg) of 60 computer science student that were tested positive with pregnancy as a result of one month lecture's strike in Kenyatta University.

Mass (kg)	60-64	65-69	70-74	75-79	80-84	85-89	90-94
frequency	2	4	8	22	18	5	1

Using the data determine

(i) Mean [3marks]
(ii) Mode [3marks]
(iii) The lower quartile [3marks]
(iv) 80^{th} percentile [3marks]
(v) The standard deviation [4marks]

QUESTION FIVE (20MARKS)

(a) Find the expansion of the following using pascal's triangle [4marks]

$(2p + 2q)^4$

(b) Draw the graph of the following function for $0^0 \leq x \leq 360°$ at an interval of 30°

Y=sin x [5marks]

(c) The second term of a GP is 2 and the fourth is 18. Find the possible values of the common ratio and the corresponding 1^{st} term. [5marks]

(d) A bag contains 3 white phone, 2 red phone and 5 green phone. A phone is selected and replaced. A second phone is selected and its colour noted. Find the probability of. [6marks]

(i) Selecting 2 red phone

(ii) Selecting 1 red phone and then 1 green phone

(iii) Selecting 1 white phone and then 1 red phone.
