

CHUKA



UNIVERSITY

SUPPLEMENTARY / SPECIAL EXAMINATIONS

**SECOND YEAR EXAMINATION FOR THE AWARD OF CERTIFICATE IN ANIMAL
HEALTH AND PRODUCTION**

MATH 00101: FOUNDATION MATHEMATICS

STREAMS: Y2 S1

TIME: 2 HOURS

DAY/DATE: MONDAY 16/11/2020

2.30 P.M - 4.30 P.M.

INSTRUCTIONS:

- Answer all questions in section A and any other two in section B
- Do not write anything on the question paper
- Non-programmable electronic calculators may be used

SECTION A**QUESTION ONE (30 MARKS)**

a) Simplify

- i. Write out the following series in full (4 marks)

$$\sum_{i=1}^4 (i^2 + 2)$$

- ii. $\frac{12x^6}{3x^4 5x^{-2}}$ (2 marks)

- iii. $\frac{x^3 y^4}{x^4 y}$ (2 marks)

b) Solve the Quadratic equation by completing square method

$$2x^2 - 2x + 1 = 0 \quad (4 \text{ marks})$$

- c) Solve for x given that $9(81^x) = \frac{1}{27^{x-2}}$ (3 marks)

- d) Evaluate without using calculators
- i. $\log_4 2$ (2 marks)
 - ii. $\log_3 \left(\frac{1}{27} \right)$ (3 marks)
- e) Find the sum of the first 10 terms of a GP with first term 3 and common ratio 2 (3 marks)
- f) Solve the trigonometric equation (4 marks)
- $$2 \tan^2 \theta = \tan \theta + 1 \text{ for } 0 \leq \theta \leq 360^\circ$$
- g) The first four terms of a GP are 1, x, y, 125. Find x and y (3 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 (7 marks)
- b) In how many ways can the letters of the word CORPORATION be arranged so that the vowels always come together (5 marks)
- c) Given $\angle BAC = 120^\circ$, $\vec{AB} = 12\text{cm}$ and $\vec{AC} = 15\text{cm}$, find $\angle ABC$ and $\angle ACB$ (8 marks)

QUESTION THREE (20 MARKS)

- a) Calculate all the angles in a triangle whose lengths are 5.5cm, 4.2cm and 3.8cm (5 marks)
- b) Obtain the remainder when $2x^3 + x^2 - 6x + 9$ is divided by $x - 2$ (5 marks)
- c) Solve the equation whose $2 \sin^2 x = \sin x$ for $0 \leq x \leq 360^\circ$ (5 marks)
- d) Find the value of x in the equation $200(1.1)^x = 20000$ (5 marks)

QUESTION FOUR (20 MARKS)

- a) A plant grows 1.67cm in its first week. Each week it grows by 4% more than it did in the week before. By how much does it grow in nine weeks including the first week (6 marks)
- b) Solve the following equations by using completing square method (8 marks)
- $$2x^2 - 2x + 1 = 0$$
- $$2x^2 + 5x - 3 = 0$$
- c) Solve for x in $10^{7+7x} - 100^x = 0$ (6 marks)

QUESTION FIVE (20 MARKS)

- a) 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)
- b) In an AP of 25 terms, 4th term is 4, 22nd term is 5. Find the sum of AP (7 marks)
- c) 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 (7 marks)

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