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**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2018/2019 ACADEMIC YEAR ONE**

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES**

**FOR THE DEGREE OF BACHELOR OF EDUCATION**

**COURSE CODE: MAT 104e**

**COURSE TITLE: BASIC MATHEMATICS AND ANALYTIC GEOMETRY**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 07/02/2020 TIME: 2.00-4.00 PM**

**INSTRUCTION TO CANDIDATES**

* **The examination has FIVE (5) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other TWO (2) questions from the remaining FOUR (4) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**This paper consists of FOUR (4) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

a). Without using tables/calculator, find the value of . (5 marks)

b).(i) Find the number of permutations of the letters of the word MISSISSIPPI (2 marks)

(ii) A committee of five comprising 3 boys and 2 girls is to be selected from 10 boys and 8 girls. In how many way can the selection be done? (3 marks)

c) (i) Convert to radians leaving (2 marks)

(ii) Convert to (2 marks)

d) Evaluate leaving your answer as a surd (3 marks)

e) Find the centre and radius of the circle (4 marks)

f) Find the distance between the points and (2 marks)

g) Find the polar equation of the circle whose Cartesian equation is (1 mark)

h) Find the polar coordinates of a point Cartesian coordinates are (4 marks)

i) Find the distance of the point from the line (2 marks)

**QUESTION TWO (20 MARKS)**

1. (i) Define a polynomial (ii) Given that find and (6 marks)
2. Find the remainder when is divided by (2 marks)
3. Show that the expression is divisible by and hence find the factors of the expression (4 marks)
4. Express in the form clearly stating the values of and (4 marks)
5. Find the values of and when is divided by and the remainder is (4 marks)

**QUESTION THREE (20 MARKS)**

1. Show that (4 marks)
2. Simplify and evaluate without using tables (3 marks)
3. Simplify (1 mark)
4. Prove that (5 marks)
5. Show that (4 marks)
6. is obtuse. is acute. Find the exact value of (3 marks)

**QUESTION FOUR (20 MARKS)**

1. Find the distance of the point from the line leaving your answer as a surd (2 marks)
2. Find the polar equation of the circle whose Cartesian equation is (3 marks)
3. Locate the focus and find the equation of the diarectrix for the parabola (4 marks)
4. Show that the point lies on the circle and find the equation of the tangent to the circle at that point (5 marks)
5. Find the coordinates of the point where the common chord of the circles and meets the line joining their centres (6 marks)

**QUESTION FIVE (20 MARKS)**

1. Evaluate (1 mark)
2. Find the number of permutations of the numbers 3,4,5,6,7 taken 3 at a time (2 marks)
3. Find the number of permutations of the letters of the word WINJRUOK. (2 marks)
4. Show that (3 marks)
5. 5 policemen are to be selected for duty from a force of 20.
6. In how many ways can this be done (2 marks)
7. In how many ways can the selection be done if two of the policemen must always be together (4 marks)
8. Find if (6 marks)