KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF ENGINEERING
END OF SECOND SEMESTER EXAMINATION, 2019/2020 (BATCH 1)
(BSC ELECTRICAL, BSC CHEMICAL, BSC PETROCHEMICAL, BSC BIOMEDICAL, BSC COMPUTER ENGINEERING)

MATH 252: CALCULUS OF SEVERAL VARIABLES

MAY, 2020

Index Number: _____

Faculty/Department: _____

INSTRUCTIONS:

1. Answer **ALL** questions.
2. Please make sure you have all **2** pages of questions.
3. Write your **Index Number** boldly in the space provided on this front page and every other sheet.
4. Programmable and Graphing Calculators are **NOT ALLOWED**
5. Please give the question paper to students

1. (a) State the domain and range of $f(x, y, z) = \ln(x + y) + xy \tan(z)$

   (b) Change the following cartesian coordinates to spherical coordinates.

   i. $(2\sqrt{3}, 2, -1)$

   ii. $(-1, 1, 2)$

2. Evaluate $\int\int\int_Q Z dv$, where Q is enclosed by the paraboloid $z = x^2 + y^2$ and the plane $z = 4$

3. Determine whether or not $f(x, y) = (x - 2xy)i + (y^2 - x^2)j$ is a conservative vector field. If it does, find its potential function.

[0]B. Barnes