THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR BACHELOR OF SCIENCE IN

ELECTRICAL & ELECTRONIC ENGINEERING

EEE 2215: ELECTROMAGNETICS I

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MAY/JUNE 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions
Maximum marks for each part of a question are clearly shown
This paper consists of **THREE** printed pages

Question 1 (30 marks)

a) A surface charge distribution is contained in a flat, wedge shaped surface whose corners are defined in a rectangular coordinate system by (2,1,2)m, (1,1,2)m and (1,3,2)m. The charge distribution is given by:

$$P_s = 3xyzC/m^2$$

Determine the total charge on the surface (10 marks)

b) A volume charge density $P_v = 3k/r\ C/m^3$ exists in a spherical region $a \le r \le b$. Determine the electric field intensity vector for

i) $r \ge b$

ii) $a \le r \le b$

(12 marks)

c) (i) Determine the magnetic field of an infinite sheet of current carrying a surface current density of K A/m using Ampere's Law.

(ii) Metallic enclosures are frequently used to shield sensitive electronics from being interfered With sources that are outside the enclosure. Explain how this shielding effect is achieved. (8 marks)

Question 2 (20 marks)

Question 3 (20 marks)

Question 4 (20 marks)

Question 5 (20 marks)