THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

Institutional-Based Programme

DIPLOMA IN MECHANICAL ENGINEERING (PLANT OPTION)

EEP 2240: PLANT ELECTRICAL

YR II SEM I

END OF SEMESTER EXAMINATIONS

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer booklet*
- *Scientific calculator*

This paper consists of **FIVE** questions

Questions **ONE** is **COMPULSORY**. Answer any other **TWO** questions

Maximum marks per each question are shown

This paper consists of **THREE** printed pages

Question 1 (Compulsory)

a) Define the following terms as used in power distribution and controls according to I.E.E regulations
   (i) Insulator
   (ii) Consumer's terminals
   (iii) Grid
   (iv) Diversity factor (4 marks)

b) (i) Outline **THREE** main sets of regulations to which an electrician must conform in order to make an installation safe (3 marks)

   (ii) With aid of a block diagrams, describe the method used to sub divide supply after it leaves the power station (8 marks)

c) (i) Flexible cords

   (ii) Flexible cables (3 marks)

d) Write down any **THREE** points each to demonstrate the difference between the following;

   (i) Aluminum and copper conductors

   (ii) Tough rubber sheathed (TRS) and polyvinyl chloride (PVC) cables (6 marks)

e) Make a sketch showing, a section through a termination of P.I.L.C.S.W.A cable to V.R.I and label all parts. (8 marks)

Question 2

a) (i) List **FOUR** cable properties

   (ii) State any **FIVE** general IEE regulations relating to conductors and cables

   (iii) State **TWO** advantages and **TWO** disadvantages of mineral insulated sheathed cables
   (iv) State **THREE** functions of main switchgear in an installation (10 marks)

b) (i) State the purpose of earth insulation resistance test

   (ii) Outline with the aid of a circuit the procedure of carrying out an earth insulation resistance test. (10 marks)

Question 3

a) (i) State **THREE** functions of a conduit in an electrical installation (3 marks)

   (ii) Describe the features of each of the TWO types of non-metallic conduit (4 marks)

(iii) With the aid of a well labeled diagram, describe the termination of conduits on reinforced concrete floor (6 marks)

b) (i) Outline **THREE** IEE conditions for installing trunking systems. (3 marks)

(ii) List **TWO** situations that would require temporary electric installation (2 marks)

(iii) Outline any two IEE regulations on temporary installation (2 marks)

Question 4

a) (i) Define catenary system of wiring and state its use (3 marks)

(ii) Outline the procedure of constructing catenary system (6 marks)

b) (i) Describe duct system of installing cables in large buildings (3 marks)

(ii) Give reasons why it may be preferred to steel conduits (2 marks)

(iii) What are the requirements of the IEE regulations with reference to cleated wiring? (6 marks)

Question 5

a) What is meant by the following:

i) Luminuious Instensity
ii) Luminous Flux
iii) Illumination (6 marks)

b) Explain the methods of reducing stroboscopic effect caused by discharge lamps (4 marks)

c) By means of a sketch, explain the law of inverse squares as applied to illumination (2 marks)

Two metal filament lamps with luminous intensities 150 Candelas and 300 Candelas respectively are fixed 10m a part on a level bench. A double sided matt white screen is placed on the line between the lamps so that side directly faces one lamp. The screen is positioned so that both sides of the screen are frequently illuminated. Calculate

i) The Distance between the screen and the larger lamp.
ii) The illumination on each side of the screen if it were positioned half way between the lamps. (8 marks)