



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN ELECTRICAL POWER ENGINEERING (CEPE 2) PP 1

**ELECTRICAL INSTALLATION TECHNOLOGY 11
EEP 1105**

END OF SEMESTER EXAMINATION SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE:

Instructions to Candidates

You should have the following for this examination

Answer booklet, examination pass and student ID

This paper consists of five Questions; Attempt any THREE Questions.)

DO not write on the question paper.

QUESTION ONE

(a) Define the following terms used in indicating instruments

- i. Damping torque
- ii. Deflecting torque
- iii. Controlling torque

(6marks)

(b) With aid of a well labeled diagram, describe the repulsion type moving iron instrument (5marks)

(ii) A permanent magnet moving coil measuring instrument gives full scale deflection at 60mV and 6mA current.

Determine how it can be calibrated to read:-

- i. Ammeter 0 - 10 A range
- ii. Voltmeter 0 - 250V (9marks)

QUESTION TWO

(a)(i) Derive the expression for the total capacitance of four capacitors connected in series (4marks)

(ii) Two capacitors having capacitances of $C_1=10\mu\text{F}$ and $15\mu\text{F}$ respectively are connected in series across a 200v supply.

Determine:-

- I. The P.d across each capacitor
- II. The charge on each capacitor
- III. Total energy stored in the circuit (6 marks)

(b)(i) State three factors affecting the capacitance of parallel plate capacitor (3 marks)

(ii) Two capacitors having capacitances of 10μ and 12μ respectively are connected in series across a 240 v supply. Determine

- i. The charge on each capacitor
- ii. Total energy stored in the circuit (7marks)

QUESTION THREE

a (i) With the aid of a circuit diagram explain any two types of generator connections.

(ii) State which type is most preferred for power distribution purpose and why (7 marks)

b. (i) Describe what is meant by a three phase, three wire supply and mention two advantages of such a system over a single phase supply.

(ii) Show that the sum of three e.m.f s of a three phase system is equivalent to zero (8 marks)

C. Derive the e.m.f. equation of a generator (5marks)

QUESTION FOUR

a (i) State three types of a single phase motors and explain which type is best suited to be used when on load starting is required.

(ii) State three applications for split phase single phase motor. (9marks)

b The magnetic field produced by single phase motor is pulsating, show by sequence of two diagrams, how the rotating magnetic field is set up. (8marks)

c. State two methods of induction motor speed control (3 marks)

QUESTION FIVE

a (i) State three common faults in an electrical installation.

(ii) Explain the three maintenance schemes (7 marks)

b (i) Describe the maintenance carried out on the following equipments:-

I. Transformer

II. Switch gear

(8 marks)

c. State four factors considered when selecting motor for a particular purpose (5marks)