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) PP2

ELECTRICAL POWER EQUIPMENT

EEP 1204

END OF SEMESTER EXAMINATION SERIES**: MAY 2016**

TIME: 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) (i) Explain why a D.C motor is not directly switched on to the supply.

(ii) State the function of the back E.M.F in a D.C motor (5marks)

(b) (i)With the aid of a circuit diagram explain any two types of D.C machine field connections (6 marks)

(ii) Explain :-

I. Armature reaction
II. Commutating E.m.f (6marks)

(c) State the reason for excessive sparking at the brushes . (3marks)

QUESTION TWO

(a) (i) State the two types of rotors used in three phase induction motors and explain typical application for each type (5marks)

(ii) Explain how the starting torque of an induction motor can be improved.

(b) (i) Draw the typical torque/speed characteristics of the three phase induction motor.

(ii)Explain why the torque of the above motor in (b) (i) is zero at synchronous speed. (7marks)

(c) State three applications for the motor in (b) (i) above (4marks)

QUESTION THREE

(a) (i) Explain :-

I. Why synchronous machine is not self- starting
II. Two methods of starting synchronous motors (8 marks)

(ii) State the uses of synchronous motors (4 marks)

(i) State the conditions to be fulfilled before a synchronous machine is connected to the Supply (5marks)

(ii) Explain why the power factor of a synchronous motor working on a constant load depends on its excitation (3marks)

QUESTION FOUR

(a) (i) With the aid of a diagram describe one type of armature winding.

(ii) State the difference between lap winding and wave winding normally used in the armature (6 marks)

(b) (i) Describe commutator windings (5 marks)

(ii) Derive the emf equation of a generator (4marks)

(c) Describe two methods of producing commutating e.m.f (5marks)

QUESTION FIVE

(a) (i) Explain using a diagram two methods by which transformer windings are would around the iron core (7marks)

(ii) State the losses that occur in a transformer (3marks)

(b) (i) Describe how the open circuit and the short circuit tests are carried out on the transformer and how they are used to determine its efficiency. (7 marks)

(c) State three applications of an autotransformer (3marks)