**MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**P.O. Box 972-60200 – Meru-Kenya.**

 **Tel: 020-2069349, 061-2309217. 064-30320 Cell phone: +254 712524293, +254 789151411**

**Fax: 064-30321**

**Website:** [**www.mucst.ac.ke**](http://www.mucst.ac.ke) **Email:** **info@mucst.ac.ke**

**University Examinations 2014/2015**

SECOND YEAR, SECOND SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL ENGINEERING

**EEE 0232: ELECTRICAL MACHINES II**

**DATE: DECEMBER 2014 TIME: 1**$\frac{1}{2}$ **HOURS**

**INSTRUCTIONS:** *Answer questions* ***on****e**and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Define (4 marks)
2. Slip
3. Frequency of motor current
4. Draw the power flow diagram for induction motor (5 marks)
5. Give reasons why (8 marks)
6. An inductions machine must run at synchronous speed
7. An induction machine can operate as an induction generator
8. A four pole induction motor has a slip of 0.02. Calculate (9 marks)
9. Synchronous speed
10. Speed of motor
11. Frequency of motor currents
12. Draw a well labelled diagram of a presentation of a circle diagram (4 marks)

**QUESTION TWO**

1. Describe the difference in operational and constructional features of induction motor. Use appropriate diagrams (10 marks)
2. State five reasons why induction motors are preferred for industrial applications

(5 marks)

**QUESTION THREE**

Show that:

1. Xr=R for maximum torque ( 4 marks)
2. Nr=s(1-Ns) (3 marks)
3. Fr=sf (3 marks)

Explain the production of torque in induction motors. Use appropriate diagrams (5 marks)

**QUESTION FOUR**

A 415v 3Φ 50 Hz 4 pole star connected induction motor runs at 24 rev/s on full load. If the motor resistance =0.35Ω and reactance = 3.5 Ω and motor-stator turns ratio is 0.85:1. Calculate (15 marks)

1. Synchronous speed
2. Slip
3. Full load torque
4. Power output if mechanical losses=700w
5. The starting torque