**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.must.ac.ke**](http://www.must.ac.ke) **Email:** **info@must.ac.ke**

**University Examinations 2015/2016**

SECOND YEAR SECOND SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL ENGINEERING

**EEE 2253: ELECTRICAL MACHINES II**

 **DATE: NOVEMBER 2015 TIME: 11/2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Define:
2. Slip (2 Marks)
3. Frequency of rotor current (2 Marks)
4. Draw the power flow diagram for an induction motor. (5 Marks)
5. Give reasons why:
6. An induction motor rotor cannot run at synchronous speed. (4 Marks)
7. Rods of the squirrel cage induction motor are skewed. (4 Marks)
8. A four pole induction motor has a slip of 0.02. Find:
9. Synchronous speed. (2 Marks)
10. Speed of motor. (2 Marks)
11. Frequency of rotor current. (2 Marks)
12. Draw a well labeled diagram for a circle diagram presenting all induction motor parameters. (7 Marks)

**QUESTION TWO (15 MARKS)**

1. With aid of well labeled diagram describe the operation of:
2. Wound motor. (4 Marks)
3. Squirrel cage motor. (4 Marks)
4. State any three constructional differences between (i) and (ii) above. (3 Marks)
5. Show that fr=sf where

f-supply frequency

s-slip

fr-frequency of rotor current. (4 Marks)

 **QUESTION THREE (15 MARKS)**

1. State conditions for maximum torque. (2 Marks)
2. Derive and expression for torque and hence the equation satisfying the conditions in (a) above. (7 Marks)
3. Enumerate three reasons why induction motors are preferred for industrial drives. (6 Marks)

**QUESTION FOUR (15 MARKS)**

1. With aid of appropriate diagrams, explain the production of torque in induction motors. (5 Marks)
2. Explain with appropriate diagrams any two methods of induction motor braking. (6 Marks)
3. With aid of well labeled torque speed characteristics depict the induction motors classes A, B, C and D characteristics. (4 Marks)