



# COLLEGE OF ENGINEERING & TECHNOLOGY

Department : Electrical & Control Engineering

Lecturer : Dr. Ahmed Kadry Abdelsalam

Course : Electrical Machines 2

Course Code : EE 322

Marks : 40

Date : 18/1/2015

Time : 2 hour

## Final Exam

Answer all the following questions

Q1 [15 marks] A.13, A.5

(a) Discuss, aided with diagrams and complete derivation of equations, how the parameters of a three phase induction motor (IM) can be determined experimentally.

(b) A test data for a 208V, 60Hz, Y connected IM rated at 1710rpm is as follows

No load test	450W	1.562A	208V
Locked rotor test	59.4W	2.77A	27V

Calculate the IM parameters referred to the stator side.

Q2 [15 marks] A15, A.5

A 6 pole, 230V, 60Hz, Y connected three phase IM has the following parameters per phase referred to the stator side:

Stator winding resistance:  $0.5\Omega$

Rotor winding resistance:  $0.25\Omega$

Stator winding leakage reactance:  $0.75\Omega$

Rotor winding leakage reactance:  $0.5\Omega$

Magnetizing reactance:  $100\Omega$

Core-loss resistance:  $500\Omega$

Considering the friction losses is 150W, determine at a slip of 2.5%:

- |                        |                       |
|------------------------|-----------------------|
| (1) synchronous speed  | (2) stator current    |
| (3) input power factor | (4) input power       |
| (5) stator copper loss | (6) rotor copper loss |
| (7) core loss          | (8) air-gap power     |
| (9) developed power    | (10) efficiency       |

Members of course Examination Committee:	Signature:	Date:
Lecturer: DR AHMED KADRY		5/1/2015
Course Coordinator : DR AHMED KADRY		5/1/2015
Head of Department: PROF HAMDY ASHOOR		5/1/2015

