



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations for 2015/2016

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**FIRST SEMESTER EXAMINATION FOR CERTIFICATE IN ELECTRICAL AND
ELECTRONICS ENGINEERING**

EPC 204: INDUSTRIAL MACHINES AND CONTROL II

DATE: 5/8/2016

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

Attempt Question One and Any Other Two

QUESTION ONE

- a) Explain the working principle of a D.C machine
- i) Motor
 - ii) Generator (6 marks)
- b) Explain the function of the following parts of a D.C machine
- i) Yoke
 - ii) Armature core
 - iii) Field windings (6 marks)
- c) List any THREE advantages and disadvantages of induction motor. (6 marks)
- d) Explain the construction of phase wound induction motor. (6 marks)

- e) A 415v ,50Hz ,4 pole induction motor is run at 1000rpm .calculate the
- i) Synchronous speed
 - ii) Slip
 - iii) rotor frequency (6 marks)

QUESTION TWO

- a) List any FIVE characteristics of synchronous (5 marks)
- b) Explain the working principle of a synchronous motor (5 marks)
- c) Explain the three modes of operation of a synchronous motor (6 marks)
- d) List the FOUR conditions to observe before connecting synchronous motor in parallel (4 marks)

QUESTION THREE

- a) Explain the THREE classification of DC Machines (6 marks)
- b) A 240v d.c motor has a shunt resistance of 50Ω .The armature resistance is 0.4Ω .The supply current is 20A .Calculate the back e.m.f (4 marks)
- c) List any major faults and remedy for
 - i) DC motor
 - ii) DC generator (6 marks)
- e) List the applications of Dc shunt Motors (4 marks)

QUESTION FOUR

- a) Explain the following terms as applied to duty cycles
 - i) Continuous rating
 - ii) Intermittent
 - iii) Short time rating (6 marks)
- b) List SIX factors to consider for the choice of a drive. (6 marks)

- c) Explain the following drives
- i) Group
 - ii) individual (4 marks)
- d) List any FOUR types of enclosures for motors. (4 marks)

QUESTION FIVE

- a) List any FIVE areas of application of squirrel cage motor. (5 marks)
- b) With the aid of a power and circuit diagrams explain the DOL starting of induction motors (10 marks)
- c) List any reasons for skewing rotor bar of induction motors. (5 marks)