



MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND YEAR SECOND SEMESTER EXAMINATION DIPLOMA IN ELECTRICAL
ENGINEERING

MED PR 214: ELECTRICAL MACHINES MECHANICAL

DATE: 20/12/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS:

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Explain The function of the following parts of a d.c machine (6 marks)
 - (i) Yoke
 - (ii) Armature core
 - (iii) Pole shoes
- b) Classify D.C motors in terms of field connections (6 marks)
- c) List any **four** applications of D.C series motor (4 marks)
- d) Highlight any reasons of skewing rotor bars of (4 marks)
- e) Explain any **three** duty cycles of machines (10 marks)

QUESTION TWO (20 MARKS)

- a) List **three** factors which determine the force of rotation of ad.c motor (3 marks)
- b) Explain any **three** methods of speed control of D.C motors (6 marks)

- c) A 250 v shunt motor takes 20A. a shunt and armature resistances are $200\ \Omega$ and $0.3\ \Omega$ respectively. Calculate (11 marks)
- (i) Back emf
 - (ii) Mechanical power

QUESTION THREE (20 MARKS)

- a) List advantage of power factor improvement (4 marks)
- b) Explain any **three** methods of power factors correction (16 marks)

QUESTION FOUR (20 MARKS)

- a) List **three** drives used in electrical (3 marks)
- b) Highlight the factors to consider for choice of an electricity drive (7 marks)
- c) Explain any **four** motor enclosures (10 marks)

QUESTION FIVE (20 MARKS)

- a) List the **two** types induction motors (2 marks)
- b) Explain the operation of induction motor operates from 50HZ supply calculate
 - i) Synchronous speed
 - ii) Slip at motor speed of 900rpm
 - iii) Rotor speed at stand still (10 marks)