



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY
ELECTRICAL AND ELECTRONICS ENGINEERING DEPARTMENT

UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN TECHNOLOGY
EEP 1204 : POWER EQUIPMENT

END OF SEMESTER EXAMINATION

SERIES: August ,2019

TIME: 2HOURS

DATE:

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

*This paper consists of five questions. Answer **ANY THREE QUESTIONS.***

Do not write on the question paper.

QUESTION ONE

- (a) (i) With the aid of a circuit diagrams explain two types of D.C machine field connections (9 marks)
- (b) Define the following terms used in D.C machines :-
i) Armature reaction
ii) Commutation (6marks)
- (c) (i) State methods of improving commutation
- (ii) Explain the reasons for excessive sparking at the brushes of D.C Machine (5 marks)

QUESTION TWO

- (a) (i) With the aid of a diagram describe one type of armature winding.
(ii) State the difference between lap winding and wave winding normally used in the armature (8 marks)
- (b) (i) Describe two methods of producing commutating e.m.f (6 marks)
- (ii) Derive the e.m.f. equation for e.m.f. generated in an armature winding (6 marks)

QUESTION THREE

- a) (i) Explain with the aid of a diagram the construction details of a double cage squirrel cage induction motors.
(ii) State three advantages of the above motor in a(i) over slipring induction motors (9 marks)
- b) (i) Draw the typical torque/speed characteristics of the double cage squirrel cage induction motors. (6 marks)
(ii) Describe operating principles of the double cage induction motor in (b) (i) above (5marks)

QUESTION FOUR

- a) (i) With the aid of a diagram describe the constructional details of one type of rotor used in large synchronous generators (5marks)
(ii) If the generator has four poles calculate:-
- b) (i) The generator speed when generating 50HZ
(ii) The generator frequency at full load (8marks)
- (c) (i) Explain the “V” characteristics of the synchronous motors.
(ii) State three advantage of a synchronous motor over the normal induction motors (7 marks)

QUESTION FIVE

- (a) (i) With the aid of a circuit diagram explain the principle of operation of a capacitor start single phase induction motor.
(ii) State two applications for the motor in (a) (i) above (7marks)
- (b) (i) State how the direction of rotation of a single phase induction motor can be changed
(ii) Draw the typical torque /speed characteristics of the single phase induction motor. (8marks)
- (c) Explain briefly why a single phase motor is not self-starting (5marks)