TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN TECHNOLOGY
EEP 1201: ELECTRICAL TECHNOLOGY

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) Define the following terms:-

i. Steady state current
ii. Transients
iii. Time constant (6 marks)

(ii) A coil of inductance 8H and resistance 12Ω is suddenly connected to a 120V a.c supply. Determine:

i. The time constant
ii. The current after 0.6 sec
iii. Voltage across the resistor
iv. The current across the resistor (8 marks)

(b) (i) Describe the transient response for current decay in an L-R Circuit.

(ii) State the effects of the following elements on an A.C . Circuit:-
(I) Capacitor (II) Inductor (III) Resistor (6 marks)

QUESTION TWO

a) (i) Draw a diagram of a complex wave consisting of a fundamental and a second harmonic.
(ii) Explain three effects of harmonics (10 marks)

b) (i) Draw a diagram of a complex wave consisting of a fundamental and third harmonic
(ii) State three causes of harmonics (10 marks)

QUESTION THREE

(a) A resistance of 100 Ω an Inductor of 0.2H and a capacitance of 100μF are connected in series across 200V,50Hz supply.
Determine: - (i) The Impendence (ii) The Current
(iii) Voltage across R,L and C, (IV0 Power factor angle (v) Active power (12 marks)

(b) A series circuit having R=10 Ω,L=0.1H and C=80μF is connected to a constant voltage variable frequency supply calculate:-
(I) The resonant frequency
(II) The p.d across the inductor and the capacitor when the supply voltage is 100V.
(III) The impedance when the frequency is 50HZ. (8marks)

QUESTION FOUR

(a) (i) Explain briefly the principles which may be used to starting of single phase motors. (4 marks)

(ii)State three types of single phase motors and explain which type is best suited to be used when on load starting is required. (6marks)

(b) (i)The magnetic field produced by a single phase motors is pulsating, show by a sequency of 2 diagrams how the rotating magnetic field is set up (7 marks)

(ii) State three applications for capacitor start single phase motor (3 marks)

QUESTION FIVE

a) (i) With the aid of a diagram describe the construction of a DC machine. (7marks)

(ii) Explain the main features and purpose of a DC face plate starter. (4 marks)

b) (i) Explain with the aid of speed- torque characteristic why a D.C series motor should not be started on no load (6 marks)

(ii) With reference to the characteristics in (b) (i) state any two applications for the motor. (3 marks)