TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING & TECHNOLOGY

DEPARTMENT MECHANICHAL AND AUTOMOTIVE ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN MARINE ENGINEERING

EMR 2127: MARINE ELECTRICAL I

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2 HOURS

DATE: Sep 2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of FIVE questions. Attempt any THREE **Questions**

Do not write on the question paper.

Question ONE

a)

i. State the steps to solve the Thevenin's Theorem

ii. List the applications of Thevinin's theorem.

(6 marks)

b)

i. Using a suitable diagram derive and state the condition for maximum power transfer

ii. State the equationof maximum power transferred to the loadand efficiency of power transfer

(10 marks)

c) State:
Ohm's law for magnetic circuit.
What is meant by electromagnetic torque in motors?

(4 marks)

Question TWO

a) State:

i. Kirchoff 's circuital laws.

ii. Draw the V-I characteristics of ideal voltage source.

iii. State super position theorem.

(6 marks)

b) Differentiate between magnetic field strength and magnetic flux density
Differentiate between permeability and relative permeability

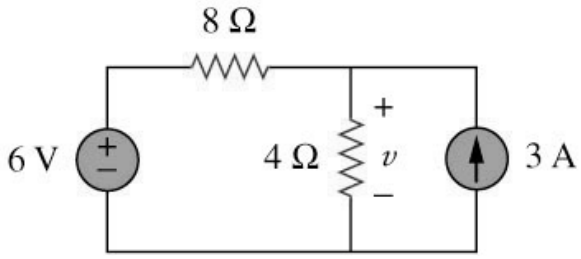
(6 marks)

c) Compare series and parallel circuits.

(8 marks)

Question THREE

(a) Use the superposition theorem to find **V** in the circuit shown below.



(5 marks)

(b) State

i. the general equation of a complex wave

ii. the RMS value of a complex wave

iii. the form factor of a complex wave

(4 marks)

(c) With clear labels draw the phasor diagrams of a transformer's different on load conditions

(9 marks)

(d) State the four main passive filter network types: **(2 marks)**

Question FOUR

a) With the help of diagrams state the four attenuator types

(8 marks)

b) Describe the main power factor improvement methods

(8 marks)

c)

i. What is meant by linear and nonlinear elements?

ii. What is meant by active and passive elements?

(4 marks)

Question FIVE

a) State the four most common battery charging methods

(8 marks)

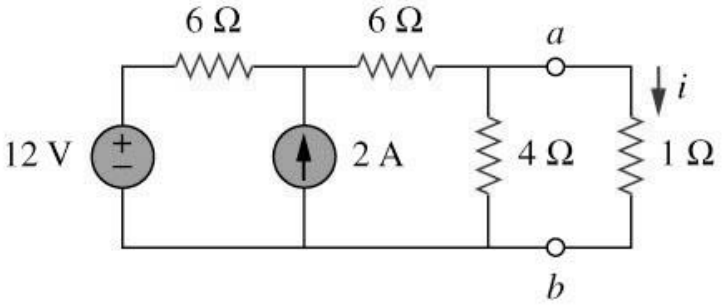
b) State the four main passive filter network types:

(2marks)

c) State the transformer efficiency equation clearly indicating its three loss types

(5 marks)

d) Using Thevenin's theorem, find the equivalent circuit to the left of the terminals in the circuit shown below. Hence find i:



(5 marks)