TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN ELECTRICAL POWER ENGINEERING (CEPE 2) PP2

ELECTRICAL TECHNOLOGY

EEP1201

END OF SEMESTER EXAMINATION SERIES:

MAY 2016

TIME: HOURS

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; Attempt any THREE Questions.*)*

DO not write on the question paper.

QUESTION ONE

(i) Define the following terms:-

I. Transients
II. Time constant
III. Steady state current (6marks)

(ii) A coil of inductance 3H and resistance 10Ω is suddenly connected to a 50V a.c supply . Determine :

I. The time constant
II. The current after 0.5sec
III. Voltage across the resistor
IV. The current across the resistor (7marks)

(a) (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)Resistor (II) Inductor (III) Capacitor (7marks)

QUESTION TWO

a) (i) Draw a diagram of a complex wave consisting of a fundamental and a third harmonic.

(ii) State three causes of harmonics

(8marks)

b) (i)Explain the three effects of harmonies

(ii) Draw a diagram of a complex wave consisting of a fundamental and second harmonic (8marks)

c) State three effects of harmonics (4marks)

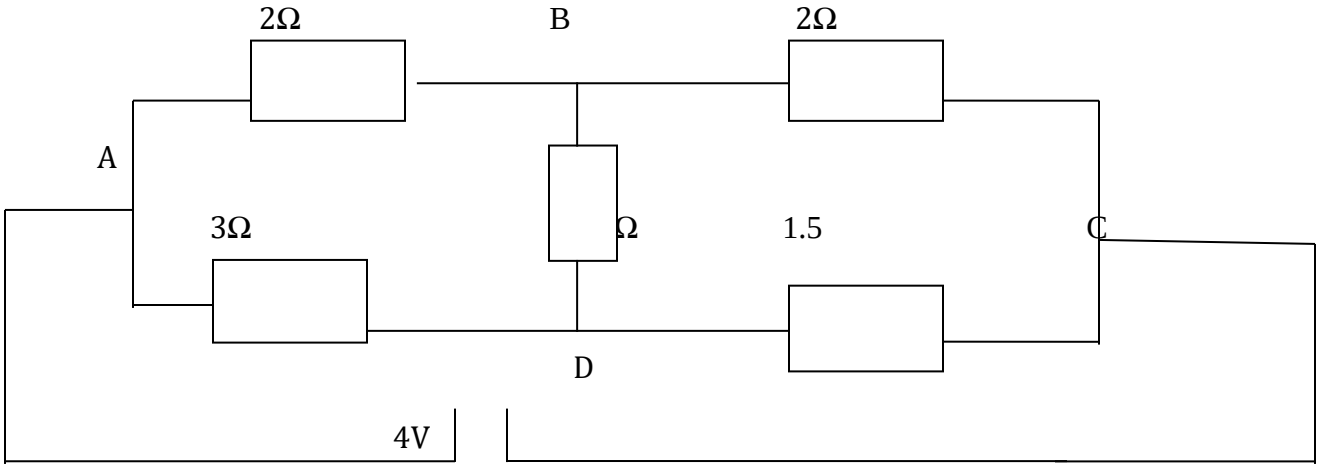
QUESTION THREE

(a) State the following theorems in relation to electrical network analysis:-

I. Thevenin's theorem

II. Norton's theorem (6marks)

(b) Determine the thevenin's equivalent circuit with respect to terminal BD of the circuit shown in figure 1



(C)

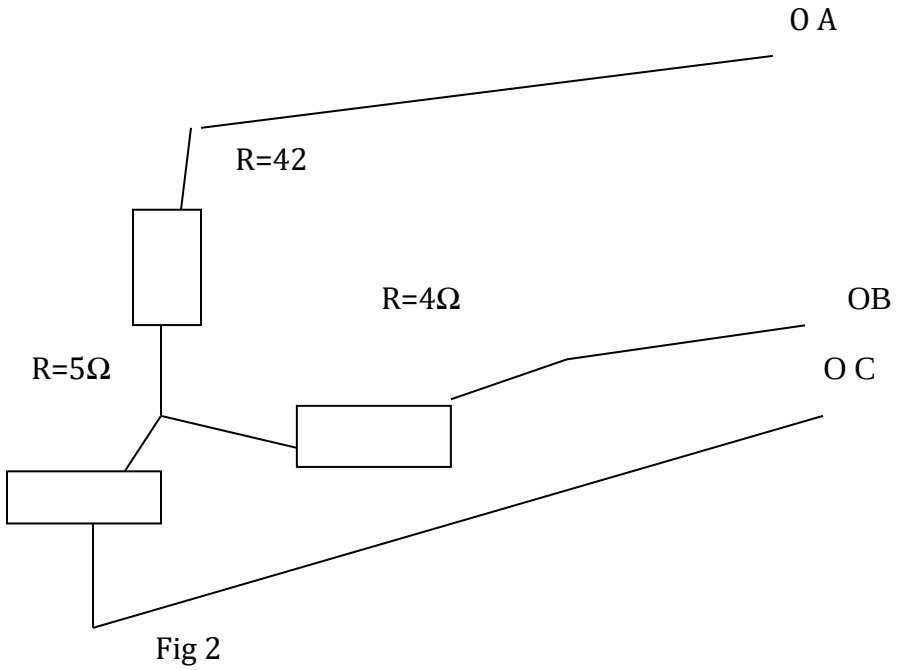


Fig 2

Three resistors 5Ω, 3Ω and 4Ω are connected star as shown in figure 2. Determine the equivalent delta connected networks showing resistances between corresponding pairs of terminals. (6 marks)

QUESTION FOUR

(a) (i)With the aid of a diagram show the production of rotating magnetic field (6marks)

(b) Explain :-

I. Why an induction motor does not run as synchronous speed
II. Slip as applied to an induction motor
III. The production of torque in the rotor of a three-phase induction motor. (9marks)

(c) State four reasons why we use starter three phase induction motors. (5marks)

QUESTION FIVE

a (i) State two methods of connecting the wings of a three phase generator and explain how they are carried out (5marks)

(ii) Describe what is meant by a three phase three wire supply and mention two advantages of such a system over a single phase (5marks)

b(i)Calculate total power taken from a three phase, 415 V(line) supply by three 50 Ω resistor when they are connected (i) in star (Ii) In delta

(ii) State two methods of power measurements in a three phase supply and explain how they are connected to the supply. (4marks)