SVKM's NMIMS
MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT & ENGINEERING

Programme: MBA Tech (ALL STREAMS) Year: I Semester: I

Academic Year: 2014-15 **Batch: 2013-14**

Subject : Basic Electrical Engineering

Date : 02/12/2014

Marks: 100
Time : 10.00 am to 1.00 pm
Durations: 3 (hrs)

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Re - Examination

Instructions:

1. Question number 1 is compulsory.
2. Attempt 5 questions in total.
3. Assume suitable data wherever necessary and mention.
4. Figures in bracket on the right indicate full marks.

Q.1 Attempt all questions each question carry equal marks (5×4=20)

(a) Calculate battery current of the circuit shown in figure 1

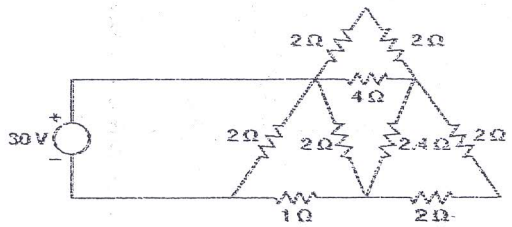

Fig.1

(b) Find the potential at point e with respect to c in the network shown in figure 2

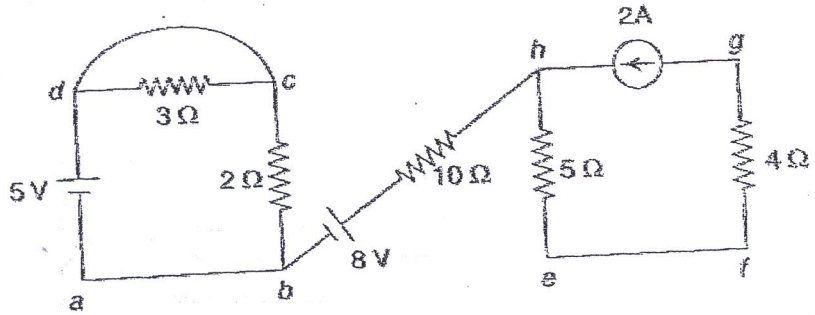

Fig.2

(c) For the circuit shown in fig 3, find the equivalent resistance across the terminals A and B

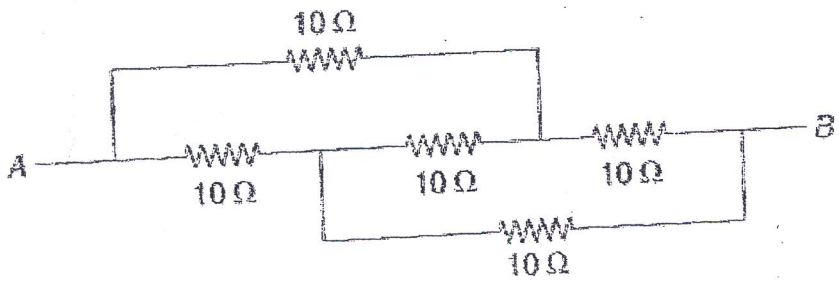

Fig.3

(d) A network of resistance is formed as follows as in figure 4. Compute the network resistance measured between B and C using star delta conversion technique

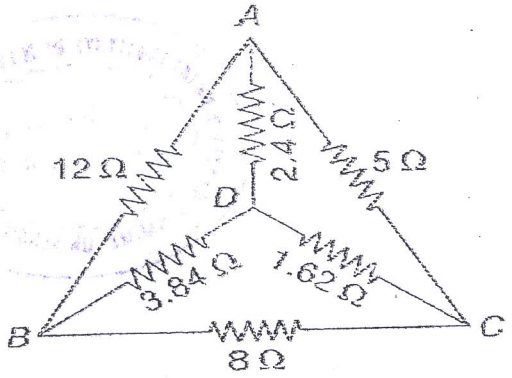

Fig 4

(e) Calculate battery current of the network of figure 5

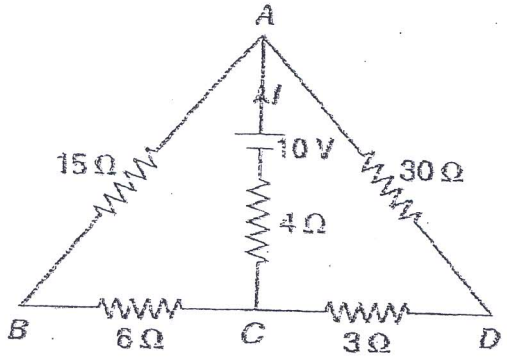

Fig.5

Q.2 (10)

(a) an R-L-C series circuit shown in figure 6 has a current that lags behind the applied (10) voltage by 45°. The voltage across the inductance has a maximum value equal to twice the maximum value of voltage across capacitor. Voltage across inductor is 300 sin (100t) and R =20Ω. Find the value of inductance and capacitance.

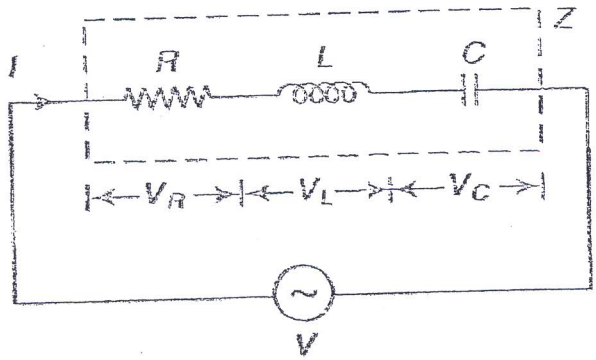

Fig.6

(10)

(b) A wave form shown in figure 7 calculate the (i) r.m.s value of wave form and (ii) Peak factor of the waveform

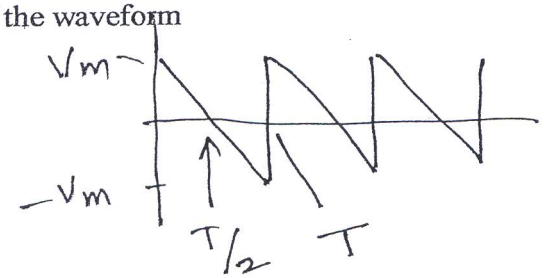

Fig.7

2/4

3. (10)

(a) A three phase, 220V, 50 Hz, 11.2 k W induction motor has a full load efficiency of 88% and draws a line current of 38 Amp under full load condition, when connected to three – phase, 220 V supply. Find the reading on two wattmeters connected in the circuit to measure the input to the motor. Determine also the power factor at which the motor is operating

(10)

(b) Derive EMF equation of transformer and transformer ratio and also give a comparison between ideal and practical transformer

4. (10)

(a)A 80 k VA, 3200/400 V single phase, 50 Hz, transformer has 111 turns on the secondary winding. Calculate(i) secondary full load current (ii) cross sectional area of core if the maximum flux density is 1.2 tesla

(10)

(b) By mesh analysis calculate current flowing through 5Ω resistor in the circuit shown in figure 8

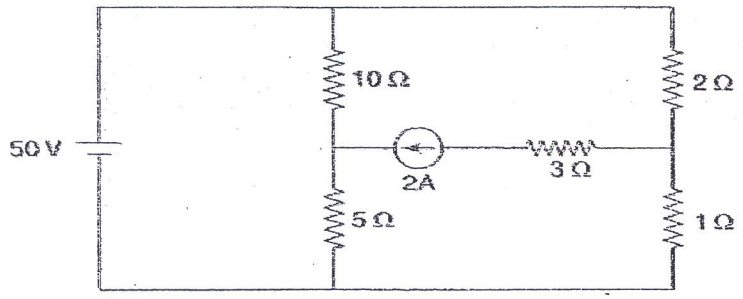

Fig.8

5. (10)

(a) Determine the current in 1Ω resistor between A and B from the network shown in figure 9 using superposition theorem

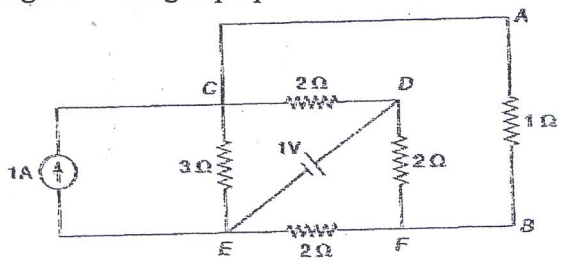

Fig.9

(10)

(b) Determine the current through 1.5Ω resistor in the network shown in fig.10 by Thevenin's theorem

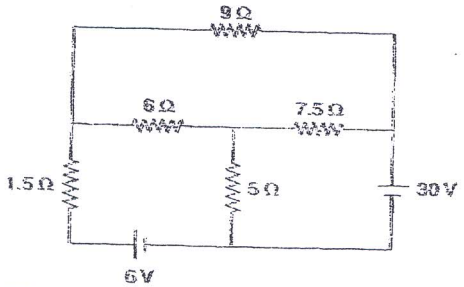

Fig .10

6. (10)

(a) Find the current in the various resistors of the circuit shown in fig 11 by nodal analysis

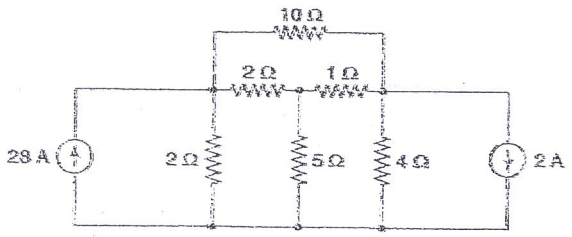

Fig.11

(b) Explain principle and working of DC motorand also give a brief description of various part of DC motor (10)

or

(b)Explain principle and working of AC motor and also give a brief description of various part of AC motor (10)

7. Write short note on following topics: (4X5=20)

(i) Faradays laws of Electromagnetic Induction (drive equation for induced e.m.f.)
(ii) Maximum power transfer theorem (derive eequation for maximum power)
(iii) Resonance Phenomenon in series R-L-C circuit
(iv) Define
   A) Flux density
   B) Permeability
   C) Susceptibility
   D) Coefficient of magnetic coupling

X———X