

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

Programme: MBA Tech (ALL STREAMS)

Year: I

Semester: I

Academic Year: 2013-14

Batch : 2013-14

Subject : Basic Electrical Engineering

Date : 11/06/2014

Marks: 100

Time : 10.00 am to 1.00 pm

Durations: 3 (hrs)

**Re - Examination**

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

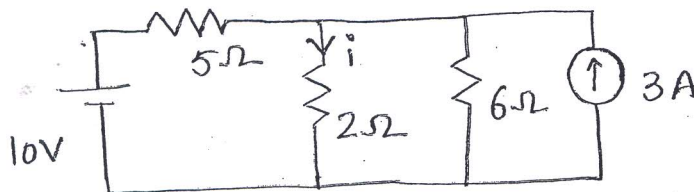
**NB:**

1. Question No. One is compulsory.
2. Out of remaining questions, attempt any Four questions.
3. In all Five questions to be attempted.
4. All questions carry equal marks.
5. Answer to each new question to be started on a fresh page.
6. Figures in brackets on the right hand side indicate full marks.



**Q1.**

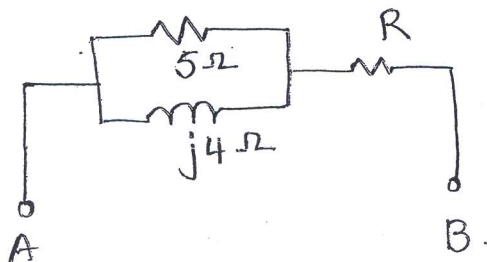
- a. Determine the current  $I$  by applying source transformation to the given circuit. (04)



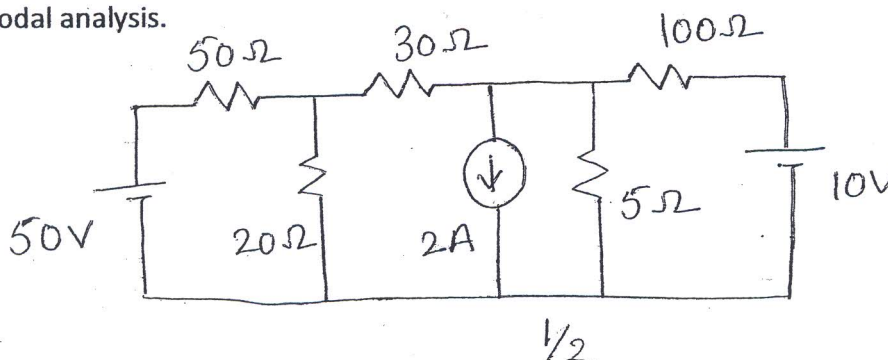
- b. Explain Bandwidth and Quality factor of series resonant circuit. (04)
- c. Draw the phasor diagram of a 3 phase star connected load with lagging power factor. (04)
- d. Derive the expression for induced emf of a single phase transformer. (04)
- e. Derive the condition for maximum power transfer through the network. (04)

**Q2.**

- a. A voltage of 150V applied between A and B produces a current of 32 A for the circuit shown in figure. Analyze the given circuit to determine the value of  $R$  and the power factor of the circuit. (10)



- b. Determine the current through 100 ohm resistor in the network shown by applying nodal analysis. (10)

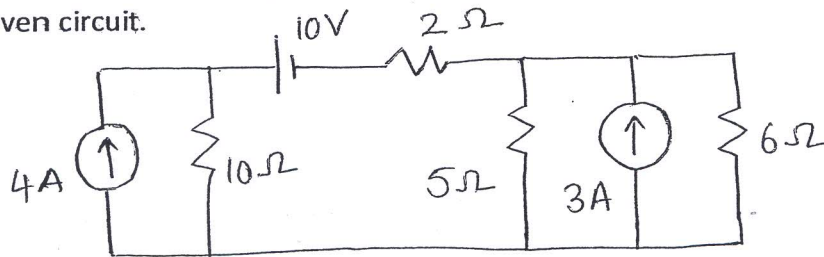


Q3.

- Each phase of star connected load consists of a 50mH inductor in series with a 50Ω resistor. The load is connected to a three phase 550V, 800rad/sec ac supply. Determine: (10)  
 (i) Phase current (ii) Line current (iii) Phase voltage (iv) Line voltage  
 (v) Power drawn by the load (vi) Reactive power.
- Explain how to get the equivalent circuit of a single phase transformer by open circuit and short circuit test. (10)

Q4.

- Explain double field revolving theory for single phase induction motor. Explain any type Split phase induction motor. (10)
- Determine the current through 6 ohm resistor by applying Superposition theorem to the given circuit. (10)

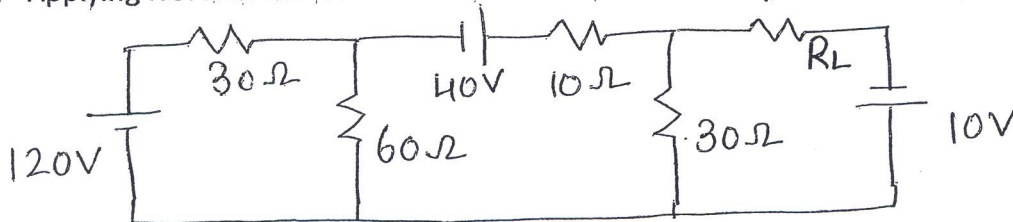


Q5.

- Explain BH curve for a magnetic material. Also explain the significance of hysteresis loop in deciding the choice of a magnetic material for a particular application. (10)
- A series circuit with  $R=5\Omega$ ,  $C=10\mu F$  and a variable inductor has an applied voltage of 10V and a frequency of 1000rad/sec. The inductor is adjusted until the voltage across resistance is maximum. Determine the (i) inductive reactance (ii) maximum current through the circuit (iii) voltage across each element. (10)

Q6.

- Applying Nortons theorem and determine the nortons equivalent circuit as seen  $R_L$ . (10)



- A iron ring is made up of two different materials A and B having a relative permeability of 1000 and 1500, respectively. The length  $L_A$  and  $L_B$  of the two materials used are 75cm and 25cm, respectively. The airgap length is 2mm. The cross sectional area of the core is  $10\text{cm}^2$ . The magnetizing coil has 1000 turns and a current of 5A is allowed to flow through it. Calculate the flux produced in the air gap. (10)

Q7.

- A single phase 100KVA, 3.3kV/230V, 50Hz transformer has 89.5% efficiency at 0.85 lag power factor both at full load and also at half load. Determine the efficiency of transformer at 75% load and 0.9 lead. (10)
- Explain the construction of a dc machine. (05)
- Explain the operation of a transformer under no load condition with the phasor diagram. (05)

X ————— X