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

Programme: MBA Tech (All Streams) Year: I Semester: I

Academic Year: 2018-2019

Subject: Basic Electrical Engineering

Date: 21 November 2018

Marks: 70
Time: 10.00 am to 1.00 pm
Durations: 3 (hrs)
No. of Pages: 04

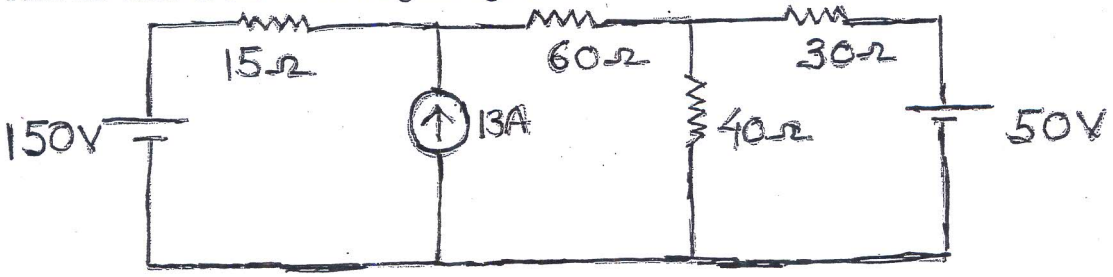
Re Exam (2017-18)

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.

1) Question No. 01 is compulsory.
2) Out of remaining questions, attempt any 04 questions.
3) **In all 05 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.**
7) **Assume suitable data if necessary.**

Q. 1)

a. Find the value of current flowing through the 30 Ω resistor using Thevenin's theorem. [05]



b. Find the average value and rms value of the waveform shown. [03]

c. Three coils, each having a resistance of 8 Ω and an inductor of 0.02H are connected in delta to a three-phase 400V, 50Hz. Calculate line current and power absorbed. [03]

d. Drive the emf equation for a single phase transformer. [03]

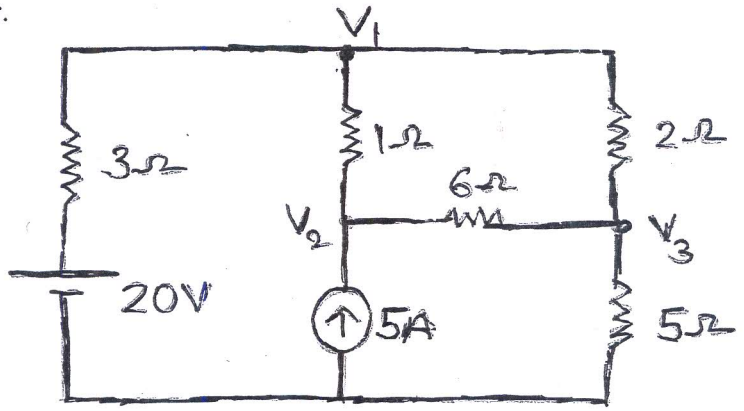
Q. 2)

a. Explain measurement of three phase power using Two Wattmeter method. [06]

b. Two coils A and B are connected in series across a 240V, 50Hz supply .The resistance of A is 5 Ω and inductance of B is 0.015 H. If the input from supply is 3KW and 2KVAR Find inductance of coil A and resistance of coil B. Calculate the voltage across each coil. [08]

Q. 3)

a. Using Nodal analysis, Calculate the node voltages V_1, V_2, V_3 and power dissipated in the 6Ω resistor. [06]



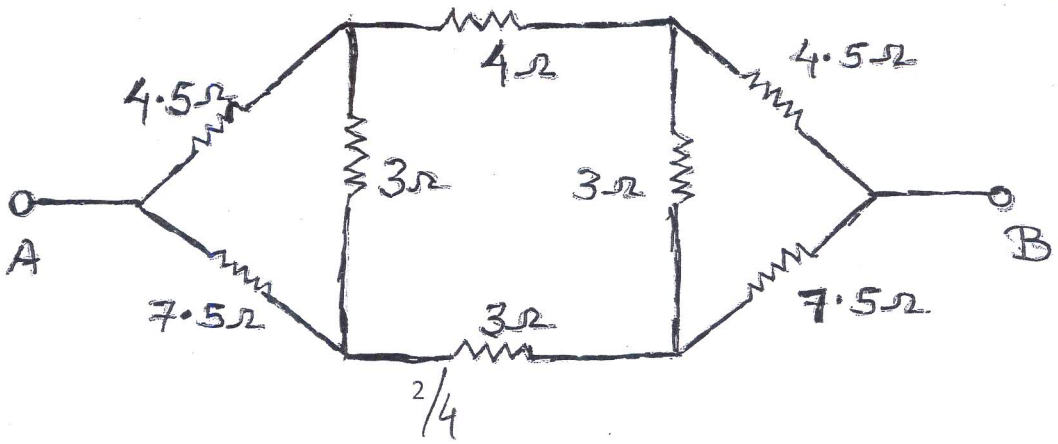
b. A 5KVA, 200/400V, 50Hz, single phase transformer gives the following results. [08]

OC test (LV Side)	200V	0.7A	60W
SC test (HV Side)	22V	16A	120W

(i) Draw the equivalent circuit of the transformer and insert all parameter values.
(ii) Find efficiency and regulation at 0.9pf (lead) if operating at rated load.
(iii) Find current at which efficiency is maximum.

Q. 4)

a. Find an equivalent resistance between terminals A and B. [05]



b. An inductor having a resistance of 25 Ω and Q_0 of 10 at a resonant frequency of 10KHz is fed from a 100V supply. [05]
Calculate:
(i) Value of series capacitance required to produce resonance with the coil.
(ii) The inductance of the coil.
(iii) Q_0 using L/C ratio.
(iv) Voltage across capacitor
(v) Voltage across coil.

c. Give the comparison between series and parallel resonance circuit. [04]

Q. 5)

a. Explain construction and working principle of single phase induction motor. [06]

b. What are the assumption of an ideal transformer? [04]

c. A series R-L-C Circuit of R=1000 Ω, L=100 mH and C=10μF.The applied voltage across the circuit is 100 V. [04]
(i) Find the resonance frequency of the circuit.
(ii) Find Q of the circuit at resonant frequency.
(iii) Calculate the bandwidth of the circuit.

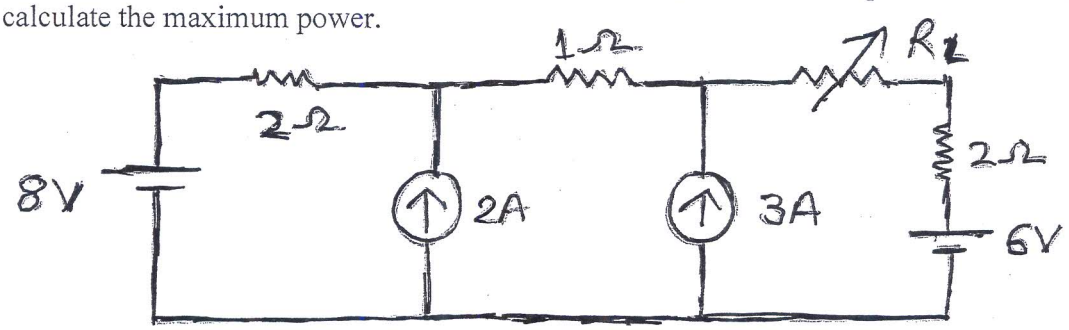
Q. 6)

a. A 415V,50Hz, three-phase voltage is applied to three star-connected identical impedances. Each impedance consists of a resistance of 15 Ω, a capacitance of 177 μF and an inductance of 0.1 henry in series. Find the [08]
(i) Power Factor
(ii) Phase current.
(iii) Line current.
(iv) Active power
(v) Reactive power and
(vi) Total VA.
Draw a neat phasor diagram .If the same impedances are connected in delta, find the line current and power consumed.

b. Draw the phasor diagram of a single-phase transformer on resistive load and inductive load. [06]

Q. 7)

a. For the circuit shown, find the value of the resistance R_L for maximum power transfer and calculate the maximum power. **[06]**



factor

b. A three-phase, 10KVA load has a power of 0.342.The power is measured by the Two Wattmeter method. Find the reading of each wattmeter when the **[04]**

(i) Power factor is leading.

(ii) Power factor is lagging.

c. Explain the types of armature windings used in DC motors. **[04]**