

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

Programme: MBA Tech (All Streams)

Year: I

Semester: I

Academic Year: 2013-2014

Subject : Basic Electrical Engineering

Date : 02/12/2013

Marks: 100

Time : 10.00 am to 1.00 pm

Duration: 3 (hrs)

Final-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. 1 is compulsory.
2. Out of remaining questions, attempt any 4 questions.
3. Answer to each new question to be started on a fresh page.
4. Assume suitable data if required.
5. All questions carry equal mark

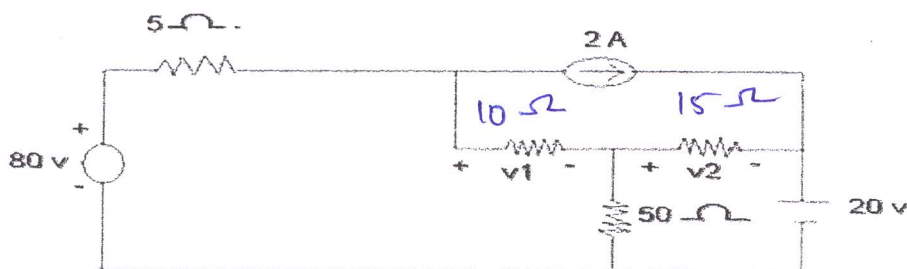
Q1:- Solve following (any four)

[20]

- (a) A resistance of $10\ \Omega$ is connected in series with two resistance each of $15\ \Omega$ arranged in parallel. What resistance must be shunted across this parallel combination so that the total current taken shall be 1.5 Amp with 20 v applied?
- (b) Show that current lags behind the voltage in series RL circuit
- (c) Explain the terms related to magnetic circuits
(i) Reluctance (ii) Flux density (iii) Residual flux.
- (d) Explain the magnetic leakage and its effect in a transformer.
- (e) Explain the condition for maximum power of DC motor.

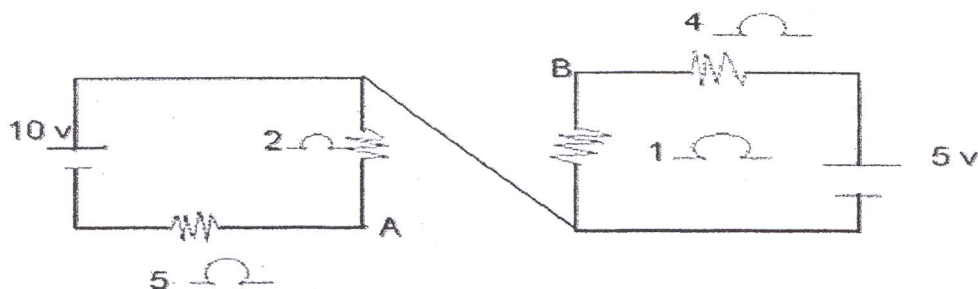
Q2:- (a) By using nodal analysis find v_1 & v_2

[08]



(b) Obtain thevenin's equivalent circuit across terminal A & B

[08]



(c) State & Explain maximum power transfer theorem.

[04]

Q3

(a) Derive expression for average value & RMS value of sinusoidally varying AC voltage.

[10]

(b) A resistance of $20\ \Omega$ an inductance of 0.24 & capacitance of $100\ \mu\text{f}$ are connected in Series across 220 V , 50 Hz mains. determine (i) Impedance (ii) current (iii) voltage across R, L & C (iv) power in watts and VA (v) Power factor & angle of lag .

[10]

Q4

(a) Define i) Self-inductance & ii) mutual inductance. Mention their units & formula to calculate each of them . Derive an expression for the energy stored in an inductor of self Inductance L henry carrying the current of 1 amperes.

[10]

(b) Compare magnetic & Electrical Circuits.

[05]

(c) A wire 2.5 m long is bent (i) into a square & (ii) into a circle. If the current flowing through The wire is 100 A . Find magnetizing force at the center of square and the center of circle.

[05]

Q5

(a) Develop the approximate equivalent Circuit of single phase Transformer.

[10]

(b) A 50 KVA transformer has $N_1:N_2=300:20$. The primary winding is connected to a 2200 V , 50 Hz supply calculate:

[06]

i) Secondary voltage on no load.

ii) Approx. values of primary & secondary currents on full load.

iii) The maximum value of the flux.

(c) What is Ideal transformer?

[04]

Q6

(a) Explain the characteristics of series motors, shunt motors & compound motors.

[10]

(b) Give the condition for maximum power of dc motor.

[04]

(c) A 220 V dc shunt motor runs at 500 rpm when the armature current is 50 A . Calculate The speed if the torque is doubled. Given that $R_a = 0.2\ \Omega$

[06]

Q7:- Write short notes. (Any three)

[20]

(i) Source Conversion

(ii) Superposition Theorem

(iii) Magnetisation Curves

(iv) AC through series RC circuit.

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