SVKM's NMIMS

MUKESH PATEL SCHOOL OF TECHNOLOGY MANAGEMENT & ENGINEERING

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

Academic Year: 2015-2016

Subject: Basic Electrical Engineering

Date: 30/11/2015

Marks : 70
Time : 10.00 am to 1.00 pm
Durations : 3 (hrs)

Final-Examination

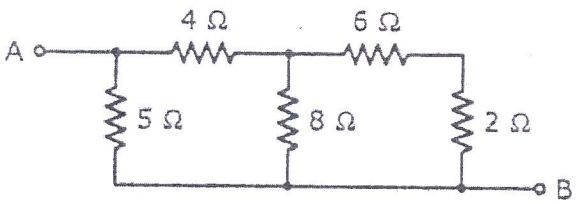
Instruction: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

NB:

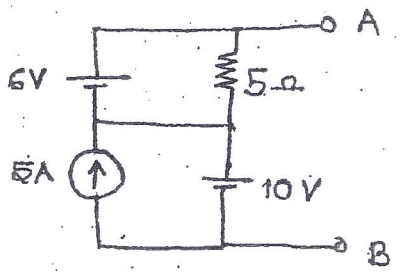
1) Question No.1 is compulsory.
2) Out of remaining questions, attempt any 4 questions.
3) In all 5 questions to be attempted.
4) All questions carry equal marks.
5) Answer to each new question to be started on a fresh page.
6) Figures in brackets on the right hand side indicate full marks.
7) Assume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

Q.1.

a) Calculate equivalent resistance between terminals A and B. [5]

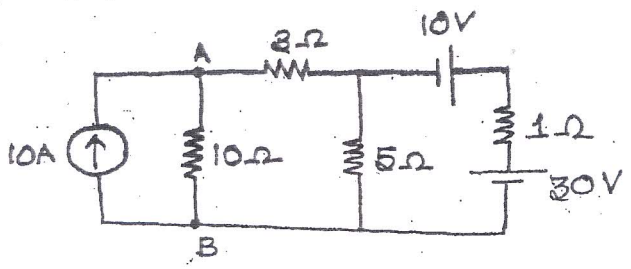


b) Find voltage V_{AB} using superposition theorem. [5]

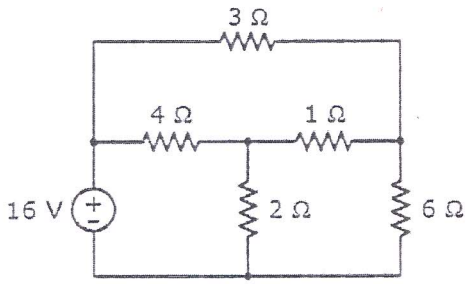


c) Compare Electrical and Magnetic circuit. [4]

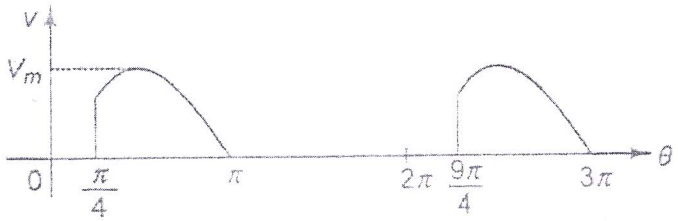
Q.2. a) Using source transformation finds the current flowing through the 10 Ω resistance



b) Find the current flowing through 6 Ω resistance by using thevenin's theorem. [7]



Q.3. a) Find average value of waveform shown. [2]

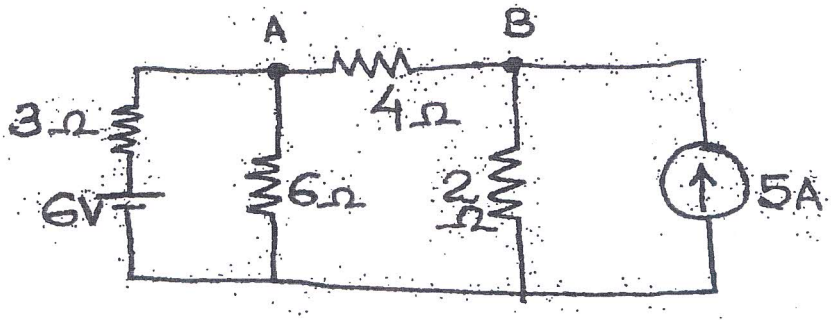


Q.3.b) Why current leads voltage in RC series circuit. Draw phasor diagram and waveforms for voltage and current. [6]

Q.3. c) Explain RLC parallel resonance with the help of circuit diagram, phasor diagram. Find the expression for resonance frequency and dynamic impedance. [6]

Q.4. a) A balanced, three phase load connected in delta draws a power of 10.44 kW at 200 V at a power factor of 0.5 lead. Find the values of the circuit elements and the reactive volt-amperes. [7]

Q.4. b) Find the current through 4 Ω resistance using Nodal analysis. [7]



[7]

Q.5 a) An iron ring of mean diameter 22 cm and cross section of 10 cm^2 has an air gap 1 mm wide. The ring is wound uniformly with 200 turns of wire. The permeability of iron is 1000. A flux of 0.16 mWb is required in air gap. What current should be passed through the wire.

[7]

Two coils, A of 12500 turns and B of 16,000 turns, lie in parallel planes so that 60 % of flux produced in coil A links coil B. it is found that a current of 5A in A produces a flux of 0.6 mWb while the same current in B produces 0.8 mWb. Determine (i) mutual inductance and coupling coefficient.

Q.6 a) With the help of a neat diagram explain how short circuit test is conducted on a single phase transformer. [7]

Q.6 b) A 5kVA, 240/2400 V, 50 Hz single phase transformer has the maximum value of flux density as 1.2 Tesla. If the emf per turn is 8 V. calculate number of primary and secondary turns and the primary and secondary current at full load. [7]

Q.7 a) Derive the emf equation of DC motor. [4]

Q.7 b) With neat circuit diagram explain the types of DC motor. [5]

Q.7 c) Explain the working principle and construction of three phase induction motor [5]
