

Level: Bachelor

Semester: Spring

Year : 2018

Programme: BE

Full Marks: 100

Course: Basic Electrical Engineering

Pass Marks: 45

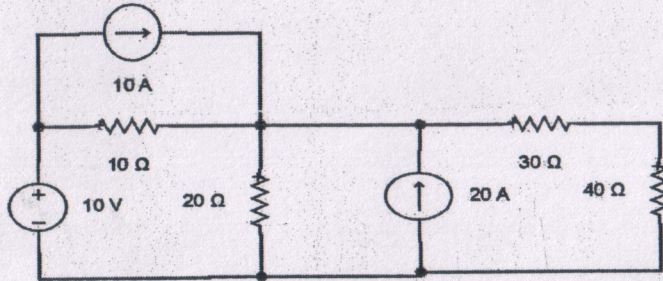
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

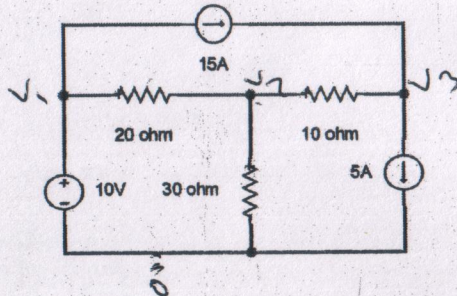
The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Explain in brief about generation, transmission and distribution of electrical power with the help of single line diagram. 7
- b) Using Mesh analysis method, find the voltage across $10\ \Omega$ resistor of the circuit as shown below. 8

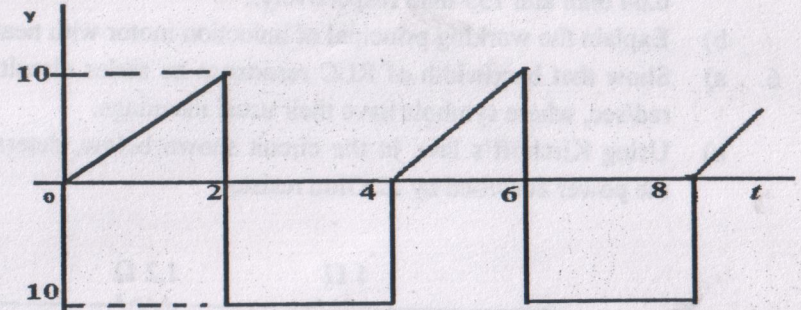


2. a) State Superposition Theorem. Find voltage drop across $20\ \Omega$ resistor using Superposition Theorem. 8

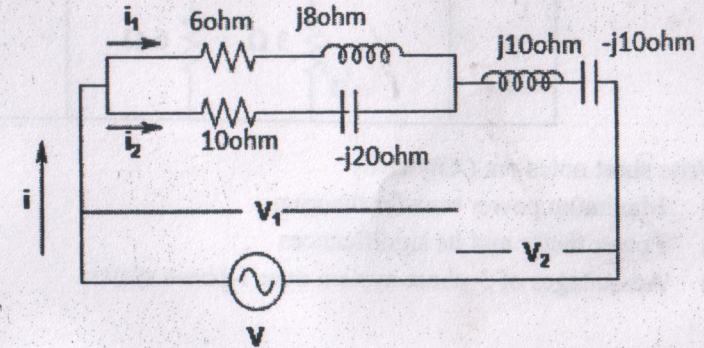


- b) State and explain Norton's Theorem with an appropriate example. 7

3. a) Find the average value, rms value and form factor of the given triangular waveform? 7



- b) In the circuit given below, total current $i = (20 + j0)\text{A}$. Calculate branch current i_1 and i_2 (ii) voltage V_1 and V_2 (ii) power factor of entire circuit (iv) Active and Reactive power in the entire circuit. 8



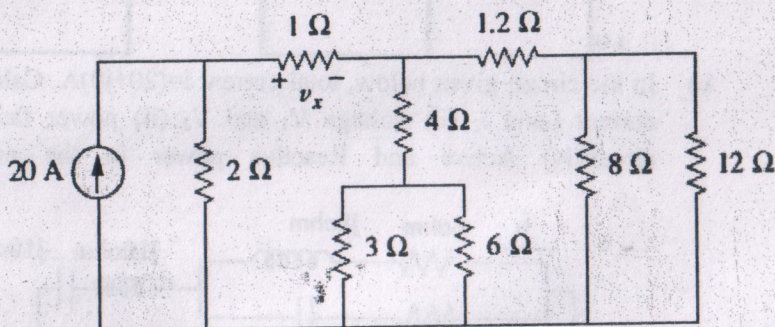
4. a) A balance delta connected load of $(2 + j3)\ \Omega$ per phase is connected to the balanced 3-phase, 440V 50Hz supply, Find: (a) Line current (b) Total active power. (c) Total Reactive power. (d) Total apparent power. 8
- b) The following results were obtained on a 4kVA, 200/400V, 50Hz transformer. 7

Open	circuit	test:	100W,	1A,	200V
Short	circuit	test:	85W,	10A,	15V

Determine equivalent circuit parameters referred to LV side and HV

side.

5. a) A 220V, dc shunt motor draws a current of 50A at full load and runs with a speed of 1700rpm. Calculate the value of resistance to be inserted in the armature circuit so that the speed drops to 1200rpm at constant load. Given that armature resistance and field resistance are 0.04 ohm and 155 ohm respectively. 8
- b) Explain the working principal of induction motor with neat diagram. 7
6. a) Show that bandwidth of RLC resonance ac series circuit is $W = R/L$ rad/sec, where symbols have their usual meanings. 7
- b) Using Kirchoff's law, in the circuit shown below, determine v_x and the power absorbed by 12 Ohm resistor. 8



7. Write short notes on: (Any two) 2×5
- a) Maximum power transfer theorem
- b) Power factor and its significances
- c) Advantages of 3-phase system over 1-phase system