

R18

Code No: 152AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech I Year II Semester Examinations, May - 2019****BASIC ELECTRICAL ENGINEERING****(Common to EEE, CSE, IT)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

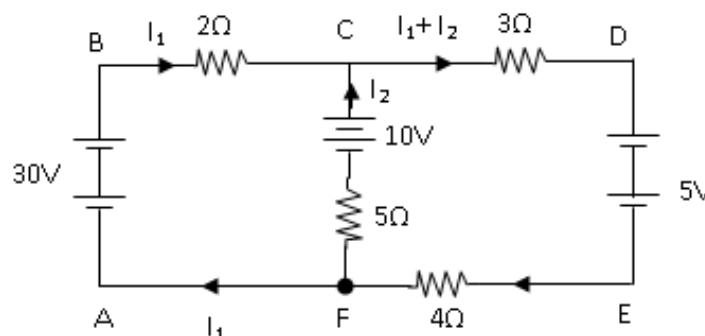
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) State the KCL. [2]
- b) Define the RMS value of a sinusoidal quantity. [2]
- c) List the various losses in the transformer. [2]
- d) What are the different speed control methods of induction motor? [2]
- e) What are the types of cables? [2]
- f) States the Norton's theorem. [3]
- g) What are the merits of polyphase system? [3]
- h) Draw the different connection diagrams of three phase transformer. [3]
- i) Why single phase induction motor is not self starting? [3]
- j) What are the important characteristics of batteries? [3]

PART-B**(50 Marks)**

- 2.a) Define the electrical circuit elements.
- b) For the circuit shown in figure 1, find the current flowing in all the branches. [5+5]

**Figure: 1****OR**

3. Using superposition theorem calculate the current in 8 ohms resistances shown in following figure 2 (All resistance are in ohms). [10]

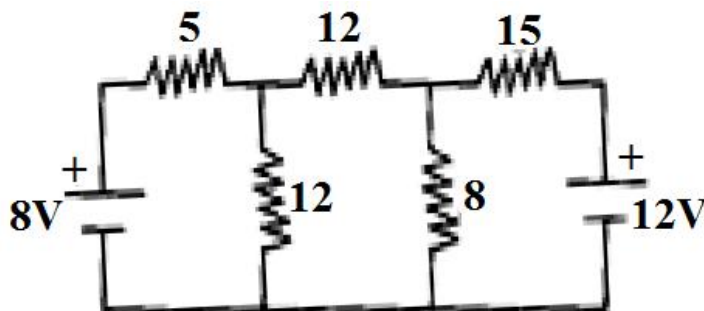


Figure: 2

4. An inductive coil consisting of a resistance of 3.1Ω and an inductance of 0.04 H is connected in parallel with a non inductive resistor of 15Ω across 240 V , 50Hz supply. Determine the following:
- Current in each branch,
 - Power absorbed by the inductive coil
 - Total current drawn from the supply and
 - Power factor of the circuit as a whole. Draw to scale the phasor diagram of the circuit.
- [10]

OR

- Derive the resonance frequency of series circuit in terms of half power frequencies.
- Derive the relation between line and phase quantities of voltages and currents for a star connected system. [5+5]
- Derive the expression for the EMF equation of a single phase transformer.
- A 20 kVA , single phase transformer has 400 turns on the primary and 250 turns on the secondary. The primary is connected to 1000V , 50 Hz Supply. Determine i) The secondary voltage and ii) The maximum value of flux. [5+5]

OR

- What is a transformer? How does it transfer electrical energy from one circuit to another?
- A 30 kVA , $200/120\text{V}$, 50 Hz transformer has a high voltage winding resistance of 0.1 ohm and a leakage reactance of 0.22 ohm . The low voltage winding resistance is 0.035 ohm and the leakage reactance is 0.012 ohm . Find the equivalent winding resistance, reactance and impedance referred to the low voltage side. [5+5]
- What are the merits and demerits of induction motor.
- A 10-pole, 3-phase induction motor runs at a speed of 485 rpm at 50 Hz supply. Determine i) synchronous speed and ii) slip. [5+5]

OR

- What is meant by synchronous speed? Explain why the speed of the induction motor never equal to be the synchronous speed.
- Explain the working principle of single phase induction motor. [5+5]
- What are the disadvantages of low power factor? Discuss the improvement of low power factor. [10]

OR

- Explain the MCB with neat diagram.
- Describe the elementary calculations for energy consumptions. [5+5]