B. Tech Degree I & II Semester (Combined) Examination June 2010

IT/CS/EC/CE/ME/SE/EB/EI/EE/FT 107 BASIC ELECTRICAL ENGINEERING AND ELECTRONICS

(2006 Scheme)

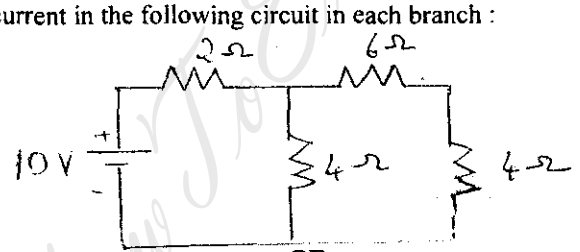
Time : 3 Hours | Maximum Marks : 100

(A) ELECTRICAL ENGINEERING

(5 x 4 = 20)

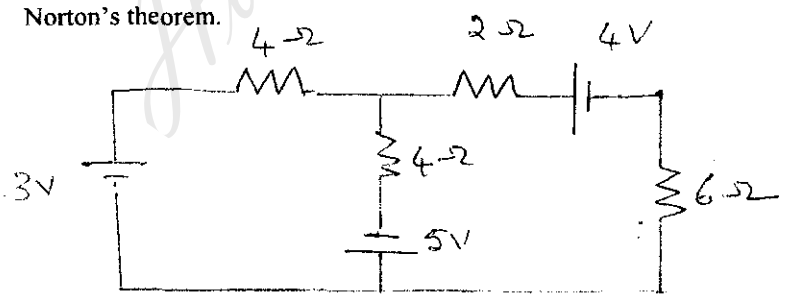
I. (a) State and explain Kirchoff's laws for an electric circuit.
(b) State and explain superposition theorem.
(c) State and explain Faraday's laws of electromagnetic induction.
(d) Define the terms :
(i) cycle (ii) frequency
(iii) amplitude (iv) time period
(e) Explain the advantages of poly phase systems over single phase system.

II. (a) What are the steps to be followed to arrive at a Thevenin's equivalent circuit? (10)
(b) Find the current in the following circuit in each branch : (5)



OR

III. For the circuit shown in figure, calculate the current in the 6Ω resistor using Norton's theorem. (15)



IV. (a) Explain the RLC series resonant circuit and derive an expression for resonant frequency. (5)

(Turn Over)

(b) A series circuit consists of a 300Ω non-inductive resistor, a $7.95\mu F$ capacitor and a $2.06H$ inductor of negligible resistance. If the supply voltage is 250 V at 50 Hz, calculate

(i) impedance (ii) circuit current
(iii) phase angle (iv) voltage drop across each element. (10)

OR

V. (a) With the aid of a phasor diagram obtain the relationship between the line and phase values of voltage in a three phase, star connected system. (10)

(b) Explain the working principle of wattmeter. (5)

(B) ELECTRONICS

(5 x 4 = 20)

VI. (a) Explain the energy band diagram of a semiconductor.

(b) Explain the working of a zener diode as a voltage regulator.

(c) Draw the V – I characteristics of an SCR.

(d) Give one typical example of a transducer for each of the following measurements :

(i) pressure (ii) velocity
(iii) vibration (iv) temperature.

(e) What is the need for modulation in communication?

VII. Draw the CE configuration circuit of a transistor. Sketch its input and output characteristics. (15)

OR

VIII. Draw the circuit of a full wave rectifier with capacitive filter. Derive the expression for ripple factor. (15)

IX. With a neat sketch explain the operation of a Cathode Ray Oscilloscope. How is phase angle measured using CRO? (15)

OR

X. What is frequency modulation? Explain with relevant waveforms. (15)

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