



EE 3002

III Semester B.Tech. in Electrical Engineering Examination, August 2011
ELECTRICAL CIRCUIT THEORY

Time : 3 Hours

Max. Marks : 75

- Instructions :** 1) Answer any five questions from Part A, and answer any five questions from Part B.
 2) Each question carries 5 (five) marks in Part A and 10 (ten) marks in Part B.

PART - A

(5x5=25)

- I. Answer any five only:
- 1) State and explain the Kirchhoff's laws.
 - 2) Derive the formula for impedance in series RLC circuits.
 - 3) State and explain Thevenin's theorem.
 - 4) What is meant by resonance? Explain.
 - 5) What are effects of unbalanced load in three phase circuits?
 - 6) Derive the equation for power measurement in two wattmeter method.
 - 7) Derive the mutual inductance in coupled circuits.
 - 8) Draw the phasor diagram for three phase circuits.

PART - B

(5x10=50)

I. Answer any five only :

- 9) Find the current in each branch of the circuit shown in fig. 1.

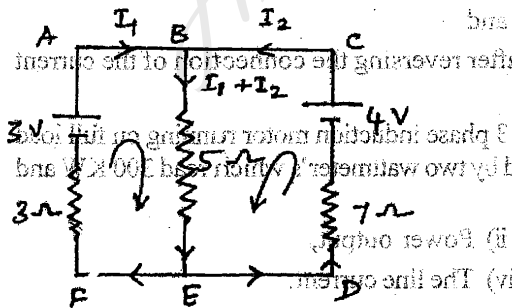


Fig. 1

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- 10) Derive the formula for star to delta and delta to star conversion.
- 11) A current of 20 amps flows in a circuit with 30° angle of lag when the applied voltage is 200 V. Find the resistance, reactance and impedance.
- 12) Find the current in 20 ohms resistance in the fig. 2 using Norton's theorem.

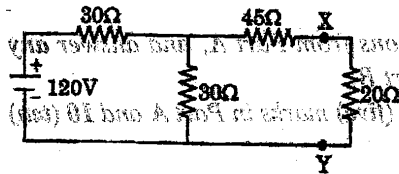
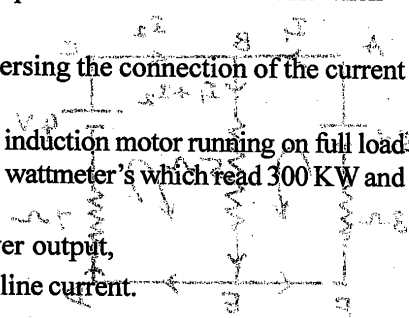


Fig. 2

- 13) A resistance of 20 ohms an inductance of 0.2 H and a capacitance 100 micro Farad connected in series across a 220 V, 50 Hz. Determine
 - i) Impedance
 - ii) Current
 - iii) Voltage drop across resistance, inductance and capacitance.
 - iv) Power factor
 - v) Phase angle
 - vi) Power in watts.
- 14) Three identical coils each having a resistance at 15 ohms and inductance of 0.5 H are connected in delta to a 415-V, 50 Hz, 3 phase supply. Determine
 - a) Line current
 - b) Power factor
 - c) Power
- 15) Two wattmeter connected to measure the power of a 3 phase circuit indicated 2500 W and 500 W respectively. Find the power factor of the circuit when
 - a) Both the readings are positive and
 - b) The later reading is obtained after reversing the connection of the current coil of the wattmeter.
- 16) The power input to a 2 KV, 50 Hz, 3 phase induction motor running on full load with 90% of efficiency, is measured by two wattmeter's which read 300 KW and 100 KW. Find
 - i) The power input
 - ii) Power output,
 - iii) Power factor and
 - iv) The line current.



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Fig. 1