

**BASIC ELECTRICAL ENGINEERING**  
Paper-ES-101A

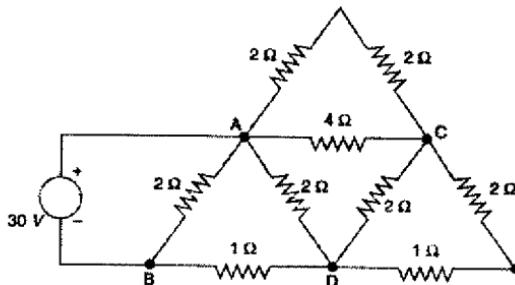
Time : Three Hours]

[Maximum Marks : 75]

**Note :** Attempt any *five* questions, selecting at least *one* question from each unit.

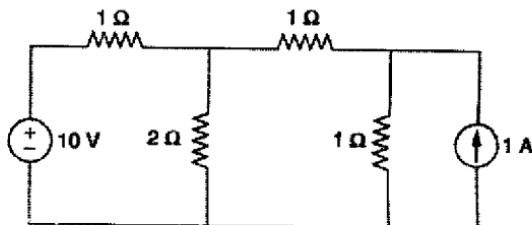
**UNIT-I**

1. (a) Explain the following terms : Active element, passive element, Bilateral Unilateral, Linear, Non-linear and Lumped elements. 5
- (b) Find out the current delivered by the source in the given circuit. 5



- (c) Define maximum power transfer theorem. Describe the condition for maximum power transfer with the help of circuit diagram. 5

2. (a) Find out the current through  $2\ \Omega$  resistance using superposition theorem for the given circuit. 5



- (b) Explain Norton theorem in brief. 10

## UNIT-II

3. (a) Define RMS and average value. Explain the terms with analytical analysis. 7
- (b) Find out the impedance, current and power factor for circuit having  $R = 12\ \text{W}$ ,  $L = 20\ \text{mH}$ , and  $C = 100\ \mu\text{F}$  voltage source of having also 230 V, 50 Hz frequency for the following combination : (i) RL series circuit  
(ii) RC series circuit and (iii) RLC series circuit. 8
4. (a) Derive the expression for resonance frequency in series RLC circuit. 7
- (b) Explain power factor. What is its importance in power system? 8

## UNIT-III

5. (a) Analysis the voltage and current relationship in terms of line and phase quantity for star connection. 7

- (b) With the aid of phasor diagram show that three phase power and power factor can be measured by using two watt meters. 8
- 6.** (a) What do you mean by single phase transformer? Explain its principal of operation with various diagrams. 7
- (b) Explain open circuit and short circuit test of single phase transformer with various equations and circuit diagrams related to them. 8

## **UNIT-IV**

- 7.** (a) What do you mean by DC machine? Explain its construction with neat and clean diagrams. 7
- (b) What are the different methods for speed control of DC motor? Write short note. 8
- 8.** (a) Draw and explain torque slip curve of induction machine with its significance. 7
- (b) Write short note on MCB, Earthing and cables. 8
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