

Roll No. ....

Total Pages : 03

**BT-I/D-21**

**41044**

BASIC ELECTRICAL ENGINEERING

ES-101A

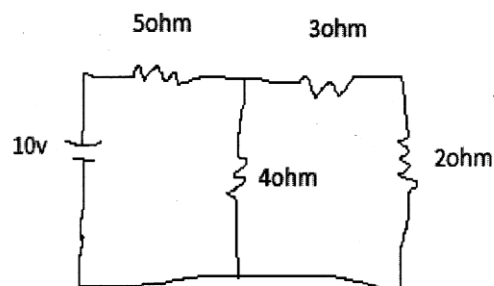
Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

**Unit I**

1. (a) State and prove Maximum Power Transfer theorem for DC circuits. Derive the expression for maximum power absorbed in the circuit. **8**
- (b) Explain star-delta transformation with diagram in detail. **7**
2. (a) Find the current through 2 ohm using Thevenin's theorem. **10**



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- (b) Explain linear and non-linear, active and passive elements in detail. **5**

### **Unit II**

3. Derive the expressions for RMS value and average value. When a circuit is excited by a sinusoidal voltage source. And also show that form factor of sinusoidal alternating current wave in 1.11. **15**
4. In an R-L-C series circuit a maximum current of 0.5 A is obtained by varying the value of inductance L. The supply voltage is fixed at 230 V, 50 Hz. When maximum current flows through the circuit, the voltage measured across the capacitor is 350 V. What are the values of the circuit parameters ? **15**

### **Unit III**

5. Explain the relationship of line and phase voltages and currents in a star and delta connected circuit. **15**
6. (a) Explain the principle of operation of 1- $\emptyset$  transformers. **7**
- (b) Explain open circuit and short circuit test of single phase transformer. **8**

### **Unit IV**

7. (a) Explain the principles of operation of DC motor. **8**

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- (b) Explain the principle of operation of synchronous motor. 7
- 8. (a) What is the function of a commutator in a DC machine ? Discuss with relevant figures. 8
- (b) Differentiate between slip rings and commutator. 7