

2054  
B.E. (Mechanical Engineering)  
Second Semester  
ESC-X 05: Basics of Electrical and Electronics Engineering

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit. Assume any missing data.

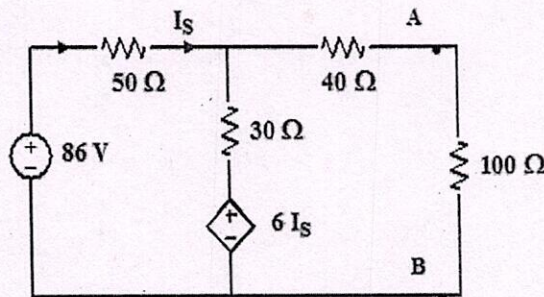
x-x-x

- (a) Write and explain emf equation of transformer.  
(b) What are the three phases of power system?  
(c) Discuss difference between decimal and binary numbers.  
(d) Explain KCL and KVL.  
(e) Write relation of phase and line voltages and currents for star and delta networks.

(5x2)

UNIT - I

- (a) Find voltage across  $100\Omega$  resistor using Thevenin Theorem.



- (b) What is FET? Explain its different types. (5, 5)
- (a) What are average and effective values of ac waveform. Derive their expressions for sinusoidal waveform.  
(b) Discuss the method of power measurement by 2-wattmeter method. (5, 5)

P.T.O.

(2)

4. Explain operation and characteristics of all types of transistors. (10)

**UNIT - II**

5. (a) Discuss hysteresis curve of magnetic materials.  
(b) Compare electric and magnetic circuits. (5,5)
6. (a) Explain open and short circuit tests of transformer.  
(b) Explain operation, principal and applications of 3-phase induction motor. (5,5)
7. (a) Draw and explain 1-line diagram of power transmission network.  
(b) What are universal gates? How other gates are realised by universal gates? (5,5)

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