

2125
B.E., First Semester
EEC-X01: Basic Electrical and Electronics Engineering
(Common with CIVIL, BIO and ECE)

Time allowed: 3 Hours

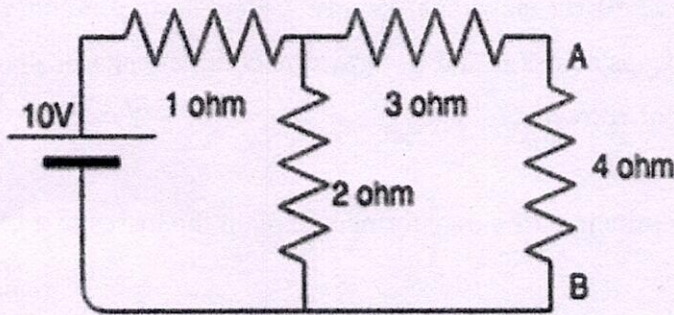
Max. Marks: 50

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

x-x-x

I. Attempt the following:-

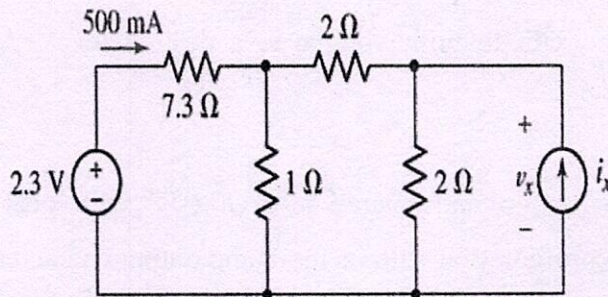
- a) Name the logic gate implemented using series diodes. Explain.
- b) Define an ideal voltage source and an ideal current source.
- c) State Maximum Power transfer theorem.
- d) What is an intrinsic semiconductor? What is input characteristic of a transistor?
- e) Calculate the Thevenin resistance across the terminal AB for the following circuit.



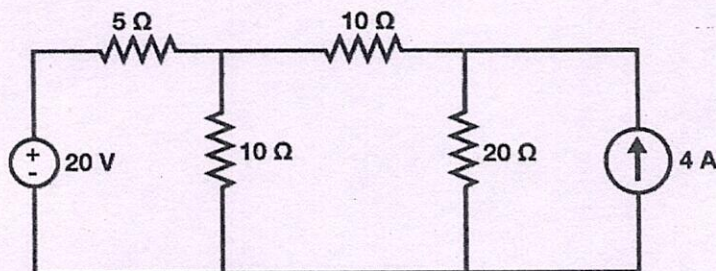
[5x2]

UNIT - I

II. a) Determine the value of V_x labelled in the circuit.



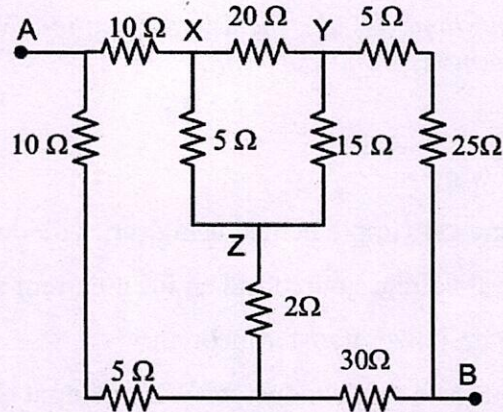
b) Find the current flowing through 20Ω using the superposition theorem.



[5+5]

(2)

- III. a) Using star/delta transformation, find the equivalent resistance between terminals A and B for the network given below:



- b) A single-phase AC circuit consists of a $20\ \Omega$ resistor in series with a $0.2\ \text{H}$ inductor connected to a $230\ \text{V}$, $50\ \text{Hz}$ sinusoidal supply. Calculate the circuit current, power factor, and voltage drops across R and L. Draw the complete phasor diagram showing all voltages and current correctly. [5+5]
- IV. State the basic working principle of a transformer. Explain the losses in a transformer and methods to reduce them. [10]

UNIT - II

- V. Explain the principle of operation of a PN diode with necessary diagrams. Discuss the forward biasing and reverse biasing mode of a diode. [10]
- VI. Design a clipper circuit to limit voltage to a desired level. What is the purpose of a Clamper circuit. [10]
- VII. Explain the construction and operation of a BJT with neat diagram. Describe the common-emitter configuration with its input and output characteristics. [10]