

2123
B. Engg. (1st Year)-1st Semester
EECX01: Basic Electrical and Electronics
(Common with Civil, Bio, ECE & EEE)

Time allowed: 3 Hours

Max. Marks: 50

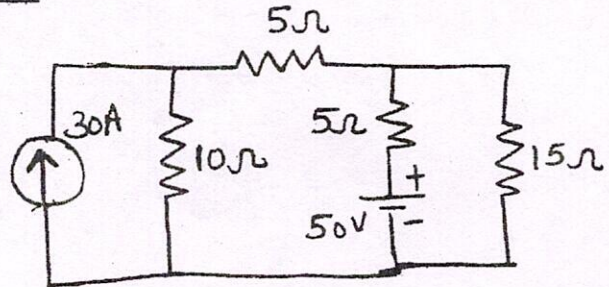
NOTE: Attempt five questions in all, including Q. No. 1 which is compulsory and selecting two questions from each Unit.

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- I. (a) State and explain Kirchoff's current and voltage laws.
(b) Under what conditions, the two wattmeter read equal and opposite when connected to measure power in 3-phase balance load.
(c) A transformer is called a static electric machine, why? Give reason.
(d) What do you understand by depletion region and potential barrier?
(e) What causes collector current to flow when the emitter current is zero? (5×2)

UNIT-I

- II. For the network shown, draw a Norton's equivalent circuit and determine the current through 15Ω resistor.



(10)

- III. (a) An alternating voltage is given as $V = 400\sin 314t$. Determine its (i) maximum value (ii) effective value (iii) frequency (iv) form factor
(b) How power is measured by two-wattmeter method in a 3-phase balanced load? Explain with neat circuit and phasors. (5+5)
- IV. Explain open-circuit and short-circuit tests of a single phase transformer giving circuit diagram for each test. Also mention uses of these tests. (10)

UNIT-II

- V. (a) Explain how a Zener diode maintains constant voltage across the load. Draw the equivalent circuit of Zener diode.
(b) A half-wave rectifier is used to supply 12V dc, to resistive load of 500Ω. If the crystal diode has a forward resistance of 25 ohm, determine the value of a.c. voltage supplied to the circuit. (5+5)
- VI. Draw the output characteristics of a transistor in CE configuration and label all the parameters. Also explain the terms: saturation region, cut off region and active region related to transistors. (10)
- VII. (a) Explain the working of positive clamping circuit.
(b) With the help of switching circuit, input/output waveforms and truth table, explain the operation of a NOT gate. (5+5)

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