Exam.Code:0906
Sub. Code: 33267

2055

B.E., Second Semester

EEC-X01: Basic Electrical and Electronics Engineering

(Common with IT, CSE, MEC)

Time allowed: 3 Hours Max. Marks: 50

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

x-x-x

I. Attempt the following:-

a) Explain the significance of power factor in an AC circuit.

b) Explain the working principle of p-n junction diode.

c) Why does saturation occur in a BJT and what are its implications?

d) Why do clamper circuit shift the DC level of a signal?

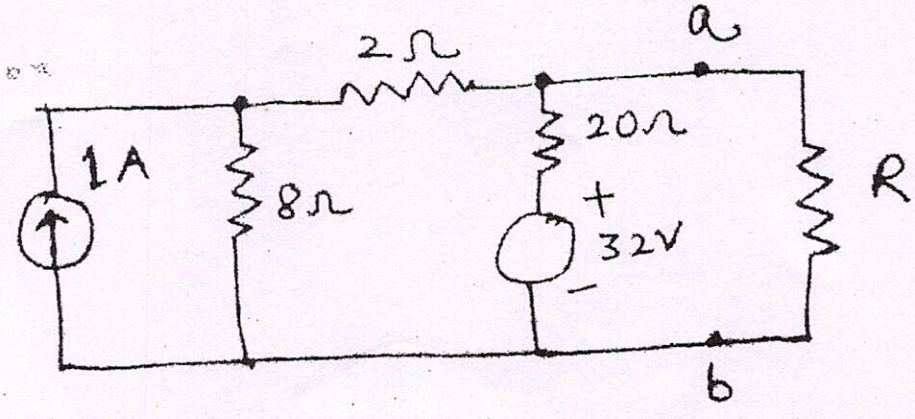
e) How the equivalent circuit helps in deciding the regulation of a transformers. (5x2)

UNIT - I

II. a) State and explain the maximum power transfer theorem. Derive the condition for maximum power transfer.

b) Derive the expression for power in a balanced three-phase system. Explain the significance of real reactive and apparent power. (2x5)

III. For the circuit shown in this figure, find the Thevenin voltage and Norton current using the principle of superposition.



(10)

P.T.O.

IV. a) Derive the EMF equation of a transformer and explain each term involved.

b) A 100 KVA transformer has full load copper loss of 1.5KW and iron loss of 1.2 kW. Find the efficiency at full load and at 0.8 power factor lagging. (2x5)

UNIT - II

V. a) Derive the working principle of a light emitting diode (LED). Explain how it differs from a normal diode.

b) A zener diode of 5V is used with a 12V supply and 220Ω series resistor. Find the current through diode if load draws 20 mA. (2x5)

VI. a) A transistor in CB configuration has I_E = 1mA, I_C = 0.98 mA. Find α and β

b) Explain the input and output characteristics of a transistor in common-base configuration. Discuss its applications. (2x5)

VII. a) Discuss diode logic gates (AND, OR). Explain the circuit operation and limitations.

b) Explain the working of a half-wave and full-wave rectifier. Compare their performance parameters. (2x5)

x-x-x