

2072
B.E. (Electrical and Electronics Engineering)
Second Semester
ESC-X05: Basic 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.

x-x-x

I. Attempt the following:-

- Which will consume more energy in a given time - a 40W lamp or a 40W tube- why? Give reasons.
- State the application of Thevenin's theorem with reference to an electric network.
- In a magnetic material, hysteresis loss cannot be reduced to zero, why? Give reason.
- While measuring power by two-wattmeter method in 3-phase system one of wattmeter does not read, why?
- Give reason why the dynamic forward resistance of a diode is more important than its static forward resistance. (5x2)

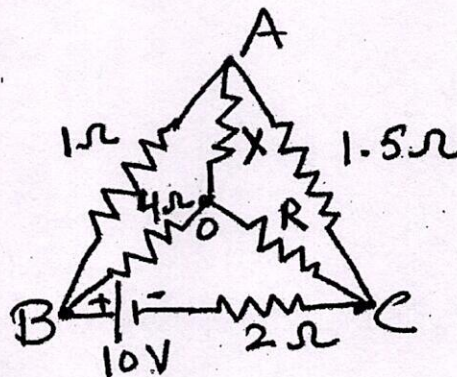
UNIT - I

II. a) For amplification, CE configuration is preferred. Give reasons why?

b) For a transistor connected in CB configuration, If $I_C = 0.95\text{mA}$, $I_B = 50\mu\text{A}$. Find the value of α . (2x5)

III. a) State and explain Norton's theorem. Show that this theorem is just the converse of Thevenin's theorem.

b) Find the value of R and the current through it in the circuit shown below when the current is zero in branch OA.



(2x5)

P.T.O.

(2)

- IV. Derive the values of form factor and peak factor of a sinusoidally varying quantity. A voltage $e = 200 \sin 100 \pi t$ is applied to a coil having value of $R = 200 \text{ ohm}$ and $L = 638 \text{ mH}$. Find the expression for current and also determine the power taken by the coil. (10)

UNIT - II

- V. a) Compare the operating principle and working of D.C. machines and induction machines. Also write their applications.

- b) The O.C. and S.C. test on a 5 KVA, 230/110V, 50Hz transformer gave following data:-

O.C. Test (H.V. side) : 230V, 0.6A, 80W

S.C. Test (L.V. side): 6V, 15A, 20W.

Calculate efficiency of transformer on full-load at 0.8 p.f. lagging. (2x5)

- VI. a) Draw the logic circuit and obtain the truth table for the following expression.

$$Y = AB + \bar{A}B + ABC$$

- b) Explain NAND gate and XOR gate using symbols and truth table. (2x5)

- VII. Write note on the following:-

- Conventional and non-conventional sources
- B/H curve
- Single line diagram of distribution network
- Electromechanical energy conversion principle

(4x2½)

x-x-x