MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : ESEE101 Basic Electrical Engineering

UPID : 001009

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer any ten of the following : [1 x 10 = 10]
   - (I) What is fuse?
   - (II) What is the efficiency of power transfer when maximum transfer of power occurs?
   - (III) In a series R-L-C circuit, what is the condition for resonance?
   - (IV) What is core type transformer?
   - (V) What Is basic principle of operation of Alternators / DC Generators?
   - (VI) What is meant by duty-cycle?
   - (VII) What is the function of a transformer?
   - (VIII) Define synchronous speed.
   - (IX) What are the main classification of inverter?
   - (X) What is secondary cell?
   - (XI) What will be the impedance of a coil containing resistance of 8.0Ω and an Inductive reactance of 6.0Ω ?
   - (XII) The full-load copper loss of a transformer is 1600 W. At half-load, what will be the copper loss?

Group-B (Short Answer Type Question)

Answer any three of the following [5 x 3 = 15]

2. What is the significance of form factor in ac circuit? [5]
3. What are the salient features of distribution transformer? [5]
4. An AC current is expressed as i=14.14sin314t. Determine its a) RMS value, b) frequency, c) instantaneous value at t=2 ms. [5]
5. What is meant by Regulation in a Transformer? [5]
6. Why are iron losses considered as constant losses in transformer? [5]

Group-C (Long Answer Type Question)

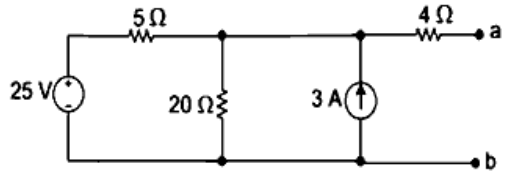
Answer any three of the following [15 x 3 = 45]

7. (a) Explain the principle of series resonance. [5]
   (b) What is half power frequency? [4]
   (c) A coil of inductance 9 H and resistance 50 Ω in series with a capacitor is supplied at constant voltage from a variable frequency source. If the maximum current of 1A occurs at 75 Hz, find the frequency when the current is 0.5 A. [6]
8. (a) What is shell type transformer? Explain in detail. [6]
   (b) The primary and secondary of a 25 kVA transformer has 500 and 40 turns, respectively. If the primary is connected to 3000 V, 50 Hz mains, calculate (i) Primary and secondary currents at full load; (ii) The secondary emf and (iii) The maximum flux in the core. Neglect magnetic leakage, resistance of the winding and the primary no-load current in relation to the full load current. [9]
9. (a) Justify that the average active power consumed by a purely inductive circuit is zero. [7]
   (b) Explain the phasor diagram of RC series circuit with a neat circuit diagram. [8]

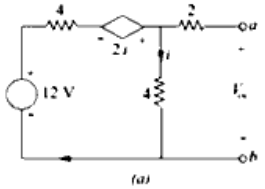
10. (a) A 100 kVA, 3300/200 volt, 50 Hz single phase transformer has 40 turns on the secondary, calculate: [9]
(i) the values of primary and secondary currents.
(ii) the number of primary turns,
(iii) the maximum value of the flux.
If the transformer is to be used on a 25 Hz system, calculate
(iv) the primary voltage, assuming that the flux is increased by 10%,
(v) the kVA rating of the transformer assuming the current density in the windings to be unaltered.

(b) Derive the emf equation of a single phase transformer. [6]

11. (a) Derive the Norton equivalent circuit of the given figure. [8]



(b) Find Thevenin equivalent circuit for the following network. [7]



https://www.makaut.com
Whatsapp @ 9300930012
Send your old paper & get 10/-
अपने पुराने पेपर्स भेजे और 10 रुपये पायें,
Paytm or Google Pay से

https://www.makaut.com