Printed Pages : 5 | 1162 | NEE-101

(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 121101 | Roll No. | | | | | | | | | |

B.Tech.

(SEM. I) THEORY EXAMINATION, 2015-16

BASIC ELECTRICAL ENGINEERING

[Time:3 hours] **[Total Marks:100]**

SECTION-A

1. Attempt **all** questions. All questions carry equal marks. (10×2=20)

(a) Define Bilateral & Unilateral Elements with example.

(b) What will happen if the primary of a transformer is connected to D.C. supply?

(c) What are the advantages of wound rotor motors over squirrel cage motors?

(d) State Superpostion Theorem & Norton's Theorem.

(e) What happens when one phase of a delta connected alternator is reversed?

(f) What do you mean by the term Resonance?

(g) What is meant by Current magnification?

(h) Define RMS value & Average value.

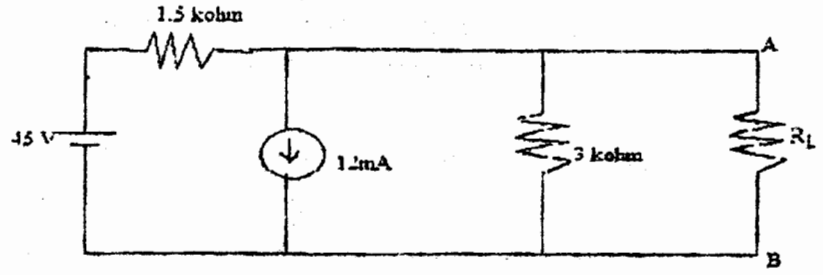
(i) Define the terms: Permeability, Relative permeability & Reluctance applied to magnetic circuits.

(j) How does magnetic circuit differ from Electric circuit?

SECTION-B

Attempt **any five** questions. All questions carry equal marks. (10×5=50)

2. (a) How Norton's Theorem is equivalent to Thevnin's Theorem? Also write the Limitations of Thevnin's Theorem and find the voltage across load resistance R_L using Thevnin's theorem when load resistance is 2 kΩ.



(b) Explain with a neat diagram, the constructional features and working of Dynamometer type Wattmeter. Also write its merits & demerits.

(c) Explain the principle of operation of a transformer. Derive E.M.F. equation of Single phase transformer.

(d) What are the causes of low power factor in supply system? Discuss its effect & how power factor is improved?

(e) List the various Losses occurring in transformer & the condition for maximum efficiency. In a 25 KVA, 2000/200 V transformer the iron & copper losses are 200 W & 400 W respectively. Calculate the efficiency at half load & 0.8 power factor lagging. determine also the maximum efficiency & the corresponding load.

(f) What are the methods of power measurement in 3-phase Ac circuits? explain Two-Wattmeter method for delta connected load.

(g) Derive the expression for Generated E.M.F. in Dc Machine. Explain the term Back E.M.F. when applied to Dc motor. Briefly explain what role Back E.M.F plays in starting & running of motor.

(h) Why is the Synchronous motor not self starting? Explain the advantages & disadvantages along with applications of Synchronous motor.

SECTION–C

Attempt **any two** parts of the following. (15×2=30)

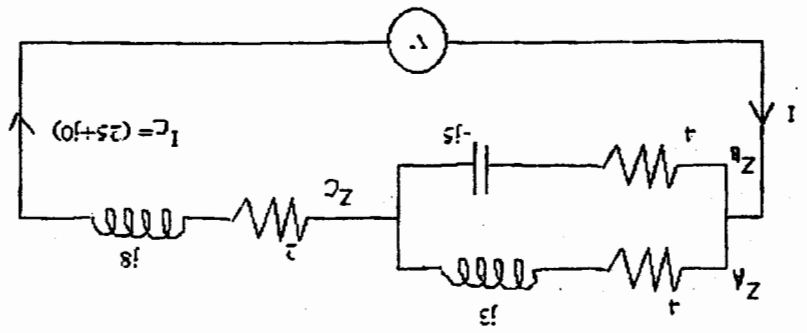
3. (a) Derive the expression of resonant frequency of parallel R-L-C circuit. In series-parallel circuit A & B are in series with C. The Impedances are: Z_A=4+j3 Ω, Z_B=4-j5 Ω, Z_C=2+j8 Ω. If the current I_C=(25+j0), calculate:

i) Branch Voltage

ii) Branch Currents

iii) Total Power

iv) Phasor Diagram



(b) Explain the working of 3-phase Induction motor. what is meant by slip? Explain Slip-Torque characteristics of 3-phase Induction motor.

(c) Obtain the relation between line & phase voltages in balanced Star connected load system. Also draw its Phasor diagram. A3-phase, star connected balanced load is supplied by 400 V, 50 Hz. The load takes a leading current of 100 √ 3 A & power 20 kW.Calculate power factor of load and Resistance & Inductance per phase.

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