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

PAPER ID : 43302 Roll No.

B. Tech. Examination, 2024-25

(Even Semester)

BASIC ELECTRICAL ENGINEERING

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : 8×1=8

   (a) Define linear and non-linear elements.

   (b) Define Kirchoff's voltage law.

   (c) Write state of Millman's theorem.

   (d) Define resonance frequency.

   (e) What is slip in induction motor?

   (f) Give formula for reactive power.

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(g) Which type of instrument can be used to measure both AC and DC quantities?

(h) Draw Norton's equivalent circuit.

SECTION – B

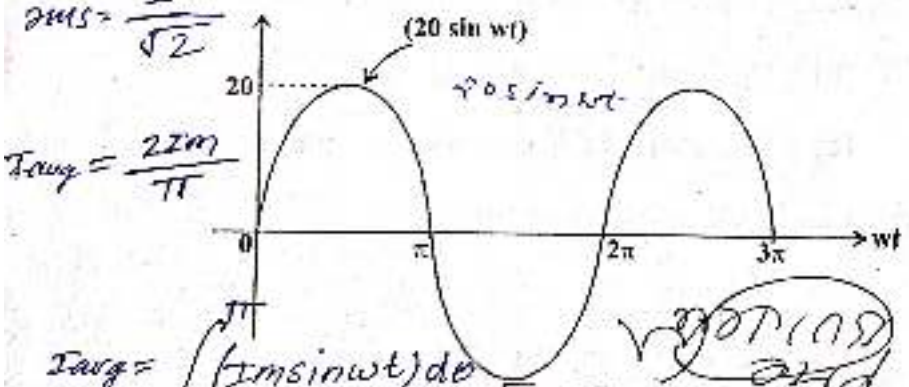
2. Attempt any two parts of the following : 2×6=12

(a) Discuss in detail moving iron instruments. Also list its advantages.

(b) Derive relationship of star to delta and delta to star transformation.

(c) Why single phase induction motor is not self starting? Give various techniques to make it self starting.

(d) Find root mean square value and average value for following sinusoidal wave :



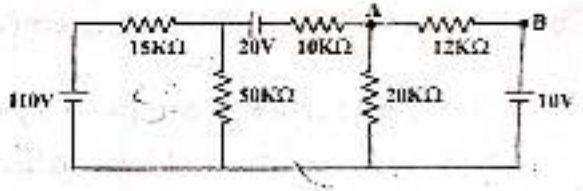
SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. 8×5=40

3. (a) Write statement of maximum power transfer theorem and prove it.

(b) Explain working and construction of D. C. motor.

(c) Find Thevenin's equivalent ckt as seen by 12KΩ resistance :



4. (a) For LCR series circuit derive an expression for resonant frequency and hence explain quality factor.

(b) Explain in detail three phase power measurement by two watt meter method.

(c) A choke coil having a resistance of 15 ohm and inductance of 0.05 H is connected in series with

a capacitor of 150 μF. The complete circuit has been connected to 250 V, 50 H, Find :

(i) Power factor, cos ϕ

(ii) Current

(iii) Impedance

5. (a) Prove that the average active power consumed in pure inductor is zero.

(b) Explain working of induction type single phase energy meter with neat sketch.

(c) What is transformer? Derive its emf equation.

6. (a) Give constructional details of synchronous motor and explain why it is not self-starting?

(b) Derive torque equation of D. C. machine.

(c) A 6 pole D. C. machine having wave wound armature has 50 slots, each slot contains 16 conductors. what will be generated emf if machine is driven at 1500 rpm. Assuming flux per pole is 7×10^{-3} weber?

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