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Name of Examination : **Winter 2020** - (Preview)

Course Code & Course Name : **EE101U - Elements of Electrical Engineering**

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Maximum Marks : **60**   Duration : **3 Hrs**

Edit   Print   View Answer Key   Close   **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. *All questions are compulsory.*
2. *Illustrate your answer with suitable figures/sketches wherever necessary.*
3. *Assume suitable additional data; if required.*
4. *Use of logarithmic table, drawing instruments and non programmable calculators is allowed.*
5. *Figures to the right indicate full marks.*

1)   Solve any three sub-questions.

a) Compute the current flowing through load resistor R_L in given figure No.1   [4]
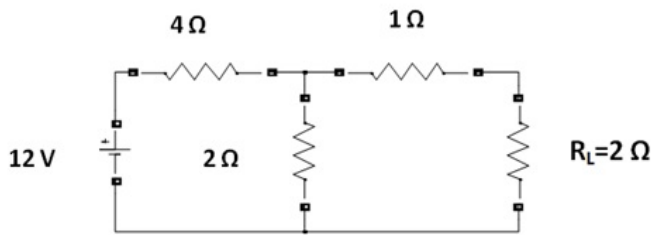

Figure No.1

b) What do you understand by DC sources? Explain source conversion with suitable example.   [4]

c) Derive an expression for the instantaneous current through pure inductance alone, when sinusoidal single phase voltage is applied.   [4]

d) Describe power and impedance triangle and explain the terms active power,reactive power and power factor.   [4]

2)   Solve any three sub-questions

a) Two impedance Z_1=2 +j6 and Z_2=6 - j12 are connected in series . If 100 volt is connected, find the resultant impedance and current in rectangular and polar form.   [4]

b) A coil of resistance 12Ω and inductive reactance of 25Ω is connected in series with a capacitive reactance of 14Ω. The combination is connected to supply of 230 volt, 50 Hz.   [4]
Find (i) Impedance (ii) Current and (iii) power consumed by circuit.

c) What do you understand by balance load? Derive and state the relation between Phase and line values of voltage and current for star connected load   [4]

d) Prove that average power consumption in pure inductor is zero when a.c voltage is applied.   [4]

3)   Solve all sub-questions

a) What is meant by hysteresis and eddy current losses in magnetic materials?   [6]

b) Compare electric and magnetic circuit by their similarities and dissimilarities.   [6]

4)   Solve any two sub-questions

a) Show that voltage ratio of primary and secondary winding of transformer is same as their turns ratio.   [6]

b) Describe voltage regulation of transformer. Comments on voltage regulation value based on nature of load.   [6]

c) Explain construction and working operation of three phase induction motor. State advantages over single phase motor.   [6]

5)   Solve any three sub-questions

a) Develop the phasor diagram of single phase transformer under load condition. Assume lagging power factor load.   [4]

b) State best safety practices and safety measure in electrical works.   [4]

c) What is the need of earthing in electrical installation? Explain with suitable example   [4]

d) Differentiate between Miniature Circuit Breaker (MCB)   and Earth Leakage Circuit Breaker (ELCB). State application   [4]

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