Final Assessment Test – April 2019

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Course: EEE1001 - Basic Electrical and Electronics Engineering

Class NBR(s): 1598 / 1862 / 3666 / 3667 / 3668 / 3669 / 3670 / 3672   Slot: G2
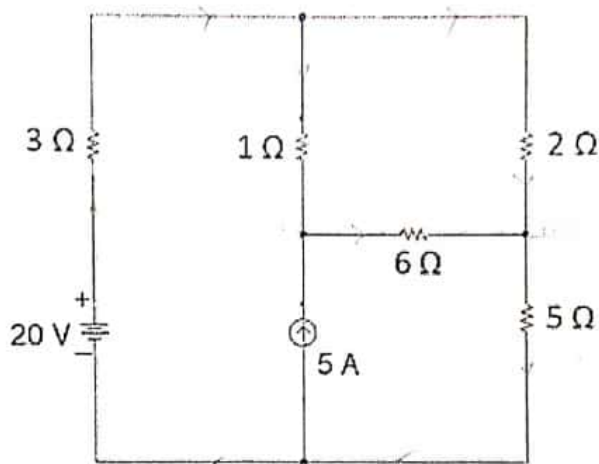
Time: **Three Hours**   Max. Marks: **100**

Answer any TEN Questions
(10 X 10 = 100 Marks)

1. Using nodal analysis, find the current through 6 Ω resistor in the circuit given in Fig below

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2. For the circuit shown in Fig below , find the value of unknown resistance "R" so that maximum power will be transferred to load. Calculate the maximum power
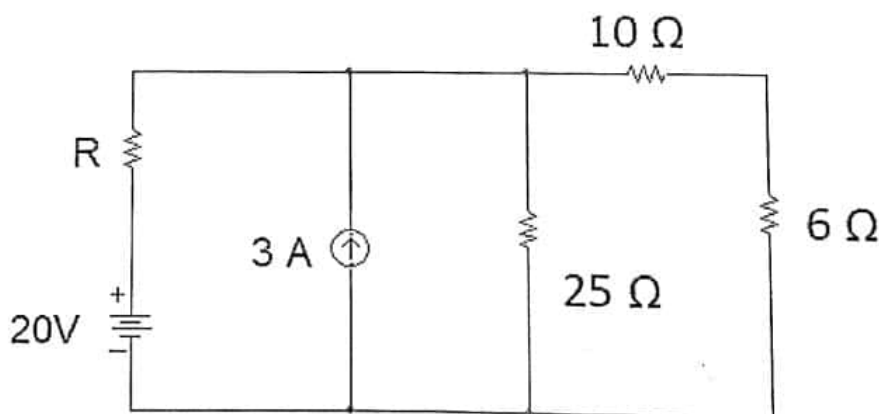
3. A series circuit having a resistance of 40 Ω, inductance of 50.07mH and a capacitor is connected across a 400V, 50Hz, AC Supply. This RLC combination draws a current of 10A. Calculate (i) Power factor (ii) Capacitor value (iii) Real and reactive power

4. A series combination of 3Ω resistance and a 796.18 µF capacitor in each branch forms a three phase star connected balanced load which is connected to a 415V, 3 phase, 50 Hz, AC supply. Calculate (i) Current drawn by the load (ii) Power consumed. If the same load is now connected as delta, calculate (iii) Current drawn by the load (iV) Power consumed. Give your inference on the power consumed in both the cases.

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5. Simplify the expression F (W,X,Y,Z) = Σ (0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14) using K-map. Draw the logical circuit for the simplified expression.

6. a) From the truth table, derive the logic circuit for a full adder using half adder circuits. [7]

   b) Convert the following into binary [3]

   108.125_{10}

   $AB.CD_{16}$

   77.177_8

7. With necessary diagrams, explain the construction and principle of operation of a DC motor. List out its classification.

8. Explain the operation of a transformer with relevant diagrams. Derive the emf equation of a transformer.

9. With relevant diagrams, explain the operation of Regulated Power Supply. Draw the output voltage waveform of each component.

10. With necessary graphs and diagrams, explain the input and output characteristics of an NPN transistor in CE configuration

11. Using Thevenin's theorem, find the current through the load resistance R_L
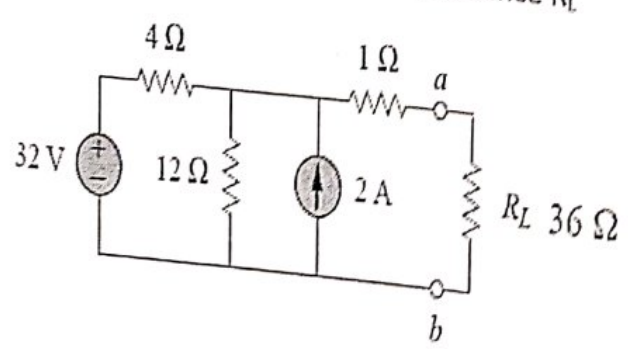
12. A series RC circuit is connected across 200V, 50 Hz ac supply draws a current of 20A. When the frequency of the supply is 100Hz, the current increases to 23.4082A. Calculate the value of resistance and capacitance of the circuit.

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