Final Assessment Test – November 2018

Course: EEE1001 - Basic Electrical and Electronics Engineering

Class NBR(s): 0602 / 0645 / 0662

Time: Three Hours

Slot: C1

Max. Marks: 100

Answer ALL Questions
(10 X 10 = 100 Marks)

1. Determine the following values for the given circuit (Fig. 1),

   (a) Total resistance across the source
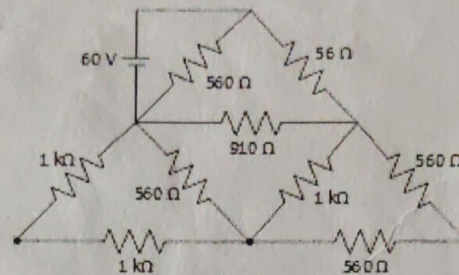
   (b) Current through 910 Ω resistor

Fig. 1

2. Use Mesh Analysis to determine the voltage V which causes the current I_1 to be zero for the circuit shown in Fig. 2.
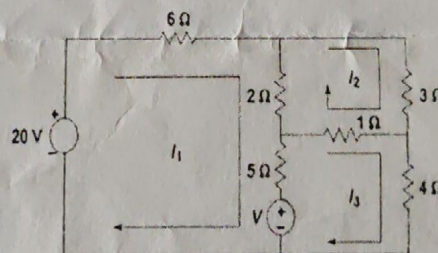

Fig. 2

3. a) A coil takes a current of 6 A when connected to a 24-V d.c. supply. To obtain the same current with a 50-Hz a.c. supply, the voltage required was 30 V. Calculate **(i)** the inductance of the coil **(ii)** the power factor of the coil. [5]

   b) Two wattmeters are used for measuring the power input and the power factor of an over-excited synchronous motor. If the readings of the meters are (– 2.0 kW) and (+ 7.0 kW) respectively, calculate the input and power factor of the motor. [5]

4. For the circuit given in Fig. 3, calculate a) the power factor b) the average power delivered by the source c) the reactive power d)the apparent power e) the complex power.

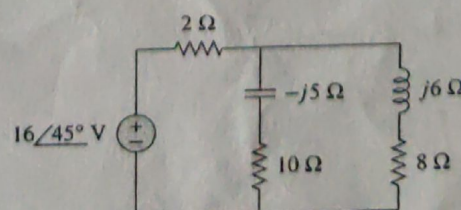
Fig. 3

5. a)   Explain the working principle of three phase induction motor.   [5]

    b)   Derive an expression for induced EMF in a DC generator.   [5]

6. a)   A four-pole generator, having wave-wound armature winding has 51 slots, each slot containing   [5]
         20 conductors. What will be the voltage generated in the machine when driven at 1500 rpm
         assuming the flux per pole to be 7.0 mWb?

    b)   List out any five differences between DC Machines and Synchronous Machine.   [5]

7. a)   Design a circuit for adding three bit using basic adder circuit.   [5]

    b)   Reduce the following function using Karnaugh map technique and implement using basic gates   [5]

$$f(A, B, C, D) = \bar{A}\bar{B}CD + A\bar{C}\bar{D} + \bar{A}BD + AC\bar{D}$$

8. a)   Simplify the expression using Boolean logic laws and De Morgan's law   [5]

$$\bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{B}\bar{C} + AB\bar{C}$$

    b)   Convert B2BEEE.1701 to binary number.   [5]

9.   Explain the characteristics of MOSFET and their applications.

10.   How Zener diode is used to stabilize the output voltage of an uncontrolled rectifier?

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