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December, 2019
B. TECH. 1st SEMESTER (UNDER CBS)
BASIC ELECTRICAL ENGINEERING (ESC-101)

Time : 3 Hours] [Max. Marks : 75

Note: 1. It is compulsory to answer the questions of Part-A. Limit your answers within 30-50 word in this part.

2. Answer any four questions from Part-B in detail.

3. Different parts of the same question are to be attempted adjacent to each other.

PART - A

1. (a) A 50 W resistance is connected across a 10 V battery. What is the current through the resistor? Find the energy consumed in 8 s. (1.5)

(b) The resistance of two wires is 25 W when connected in series and 6 W when joined in parallel. Calculate the resistance of each wire. (1.5)

(c) An alternating current is represented by i = 12 sin 314 t. Find out (a) Frequency (b) Instantaneous Value at t = 4 ms (c) Time taken to attain a value of 10 A for first time after passing through zero. (1.5)

(d) Define duality. What is the dual of capacitance and resistance? (1.5)

(e) A balanced star-connected load of (3-4j) Ω is connected to 400 V supply. What is the real power consumed by the load? (1.5)

(f) Draw and explain equivalent circuit of auto transformer. (1.5)

(g) Write the principle of operation of DC generator. (1.5)

(h) Differentiate between buck and boost converter. (1.5)

(i) Differentiate between MCB and MCCB. (1.5)

(j) Write down the various characteristics of batteries. (1.5)

PART - B

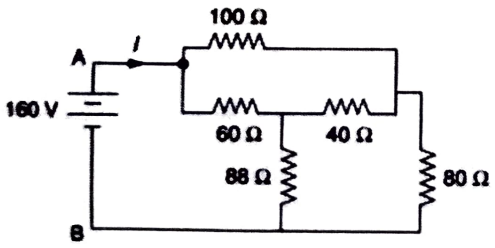


Figure 1(a)

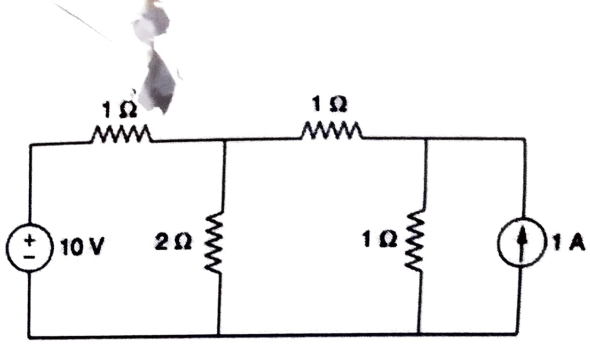
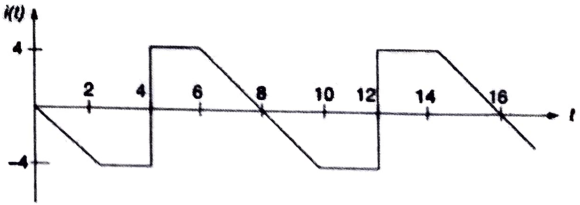


Figure 1(b)

(a) Determine the current I in the Figure 1(a). (7.5)

(b) Calculate the current through the 2Ω resistor in the circuit shown in Figure 1(b), using superposition theorem. (7.5)

3. (a) Find the RMS and Average Value of current wave form shown in figure below : (7.5)



(b) Derive the expression for power factor measurement by using two wattmeter method. Also discuss the various case related to it. (7.5)

4. (a) What is a B–H curve? Explain th ysteresis and eddy current loss. How are they minimized? (7.5)

(b) Describe efficiency and regulation of single phase transformer with various equations related to them. (7.5)

5. (a) Explain the different types of rotor in three phase induction motor. (7.5)

(b) What do you mean by synchronous motor? Differentiate synchronous motor from induction motor. (7.5)

6. Write a short note on single phase and three phase voltage source inverter in brief. (15)

7. (a) What do you mean by Earthing? Explain its various types in brief. (7.5)

(b) Define the term power factor. Write down the various benefits of power factor improvement. (7.5)