Roll No. .....

TEE–101

B. TECH. (FIRST SEMESTER)
MID SEMESTER EXAMINATION, 2018
(All Branches)
BASIC ELECTRICAL ENGINEERING

Time : 1:30 Hours

Maximum Marks : 50

Note :(i) This question paper contains two Sections.

(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks/True-False : (1×5=5 Marks)
   (a) The resistance of an ideal voltage source is ..... .
   (b) The value of peak factor for an AC sinusoidal waveform is ..... .
   (c) In three-phase AC star delta networks, line voltage is equal to phase voltage. (True/False)
   (d) Resonance does not occur due to LC components in circuits. (True/False)
   (e) Thevenin's voltage is also known as open circuit voltage. (True/False)

2. Attempt any *five* parts : (3×5=15 Marks)
   (a) Define Kirchoff's current law.
   (b) Distinguish between ideal and practical electrical energy source.
   (c) Define Norton's theorem.
   (d) Define power factor and mention its significance in electric networks.
   (e) Define RMS value of an AC signal.
   (f) Define line and phase voltage in three-phase AC circuits.

Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
   (a) State and explain Superposition theorem.
   (b) Calculate the current through 4 Ω resistance in the given network using Superposition theorem (Refer Figure 1).

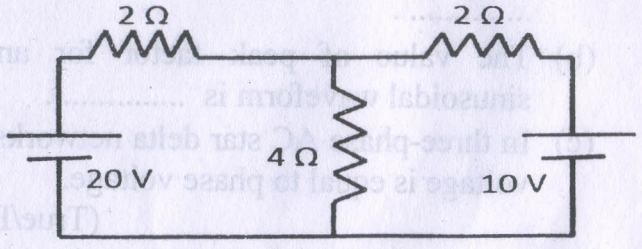

Fig. 1

   (c) Explain mesh analysis. Find the current I for the given electrical circuit (Figure 2) using mesh analysis.

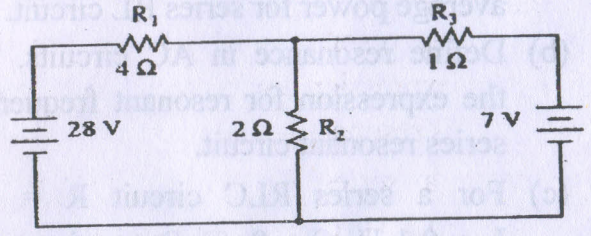

Fig. 2

4. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)
   (a) Find the Thevenin equivalent circuit across 10 Ω resistance as shown in Figure 3 and hence find load current I_L.

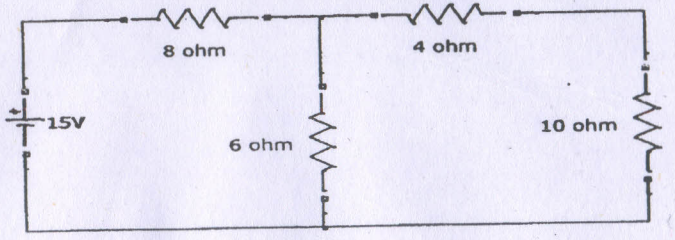

Fig. 3

   (b) Explain nodal analysis with suitable example.
   (c) Derive expression for line and phase values of voltage and current for 3-phase delta connected balanced load system.

5. Attempt any *two* parts of choice from (a), (b) and (c). (5×2=10 Marks)

   (a) Obtain an expression for instantaneous and average power for series RL circuit.

   (b) Define resonance in AC circuits. Derive the expression for resonant frequency for series resonant circuit.

   (c) For a series RLC circuit R = 10 Ω, L = 0.1 H, C = 8 μF. Determine value of resonant frequency.

F. No. : b-39