H 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) Ohm's law characteristics linear for R and non-linear for L and C. (True/False)

(b) In an RLC series circuit at resonance current is maximum. (True/False)

(c) Line Voltage lead by an angle ..... from phase voltage in three phase star connection.

(d) Quality factor value changes when change in frequency observes in series RLC circuit. (True/False)

(e) In a.c. circuit power consumed by R in terms of ....., inductor and capacitor consume in terms of .....

2. Attempt any *five* parts : (3×5=15 Marks)

(a) What is node and mesh in a circuit ? Draw an circuit having all nodes and mesh.

(b) What is meant by ideal and practical voltage source ?

(c) Define resonance and draw the phasor diagram with complete graphical representation during resonance.

(d) Why is three phase advantageous than single phase a.c. circuit ?

(e) Define frequency, time-period and form factor of sinusoidal waveform.

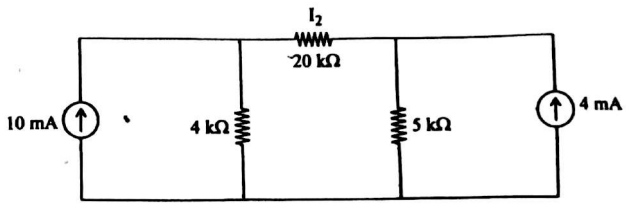
(f) Define superposition theorem.

Section—B

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

(a) State Thevenin's theorem with complete equivalent circuit. Why is it useful in electrical circuits ?

(b) Using the method of superposition, calculate the branch current I_2 in the circuit shown in Figure :



(c) Derive the expression form phasor relationship between line voltage and phase voltage, line current and phase current in three-phase delta circuit.

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

(a) Explain the following with suitable examples and/or circuit diagram(s) :

(i) Quality factor

(ii) RMS and Average value

(iii) Unilateral and Bilateral elements

(iv) Independent sources

(b) A 100 V, 50 Hz supply is applied across the series circuit consisting of R = 10Ω, L = 1 mH and C = 20 μF . Find the input current and voltage across each element.

(c) Derive the expression for Bandwidth in series a.c. circuit.

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

(a) Derive the expression for Delta to Star conversion in resistive d.c. network.

(b) A coil having a resistance of 5 Ω and an inductance of 0.2 H is connected in series with a 40-μF capacitor. The voltage applied to the circuit is 220 V. Determine the maximum current and corresponding frequency. Also, find the voltage across the capacitor and coil for this frequency.

(c) Consider the circuit shown in figure and determine Thevenin equivalent circuit for the load resistance R_L. Then determine I_L if R_L is 4, 8 and 10 kΩ.