# TEE–101

## B. TECH. (FIRST SEMESTER)

## END SEMESTER EXAMINATION, 2018

### (All Branches)

### BASIC ELECTRICAL ENGINEERING

#### Time : Three Hours

#### Maximum Marks : 100

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

(ii) Both Sections are compulsory.

### Section—A

1. Fill in the blanks :      (1×5=5 Marks)

   (a) The maximum value of slip is .......... .

   (b) The permeability of the core of ideal transformer is .......... .

   (c) Power factor (pf) of a pure inductor is .......... .

   (d) The internal resistance of an ideal current source is .......... .

   (e) The capacity of a battery is specified in terms of .......... .

       **P. T. O.**

2. Attempt any *five* parts out of seven :

$$(3 \times 5 = 15 \text{ Marks})$$

(Define/Short Numerical/Short Programming/ Draw)

(a) Define form factor, RMS value and Average value of an A.C. quantity.

(b) State and explain Kirchhoff's voltage law.

(c) Give the relationship of line and phase values of voltage and current in 3-phase star and delta connections.

(d) Define Active, Reactive and Apparent power in AC circuit.

(e) Explain the general type of fuses.

(f) Write similarities between electric and magnetic circuit.

(g) Give the advantages and disadvantages of lead acid batteries.

## Section—B

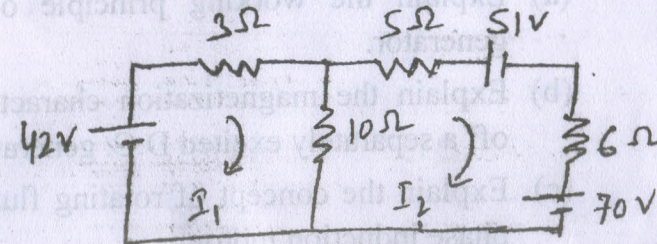3. Attempt any *two* parts of choice from (a), (b) and (c).     (10×2=20 Marks)

(a) Find the current I in the following circuit using Thevenin's theorem.
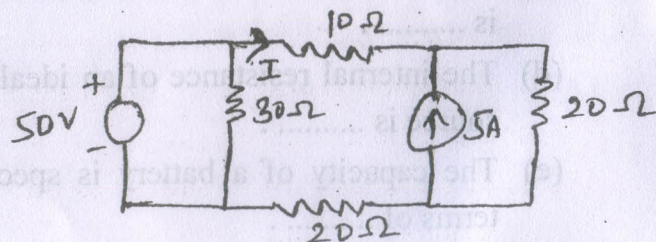
(b) Explain nodal analysis with a working examine.

(c) Find the mesh currents $I_1$ and $I_2$ for the following circuit.



4. Attempt any *two* parts of choice from (a), (b) and (c).     (10×2=20 Marks)

(a) Explain the open circuit test of single-phase transformer.

(b) A 2300/230 V, 50 Hz single-phase transformer rating is 25 kVA. It has the following resistances and reactances :

(i) $R_1 = 0.6\,\Omega$ and $X_1 = 3.0\,\Omega$

(ii) $R_2 = 0.008\,\Omega$ and $X_2 = 0.02\,\Omega$

Calculate :

(i) the equivalent resistance referred to primary as well as secondary side.

(ii) the equivalent reactance referred to primary as well as secondary side.

(c) Explain the types of losses in single phase transformer.

5. Attempt any *two* parts of choice from (a), (b) and (c).       (10×2=20 Marks)

   (a) Explain the working principle of D.C. generator.

   (b) Explain the magnetization characteristics off a separately excited D.C. generator.

   (c) Explain the concept of rotating flux in 3-phase induction motor.

6. Attempt any *two* parts of choice from (a), (b) and (c).       (10×2=20 Marks)

   (a) Differentiate between ideal transformer and practical transformer.

   (b) In a series RL circuit R = 2 Ω and L = 0.1 H, find the impedance at 50 Hz and 100 Hz and the corresponding pf.

   (c) Discuss the series resonance in a series RLC circuit and draw the curve of resistance and inductance with respect to frequency.