TEE-101

B. TECH. (FIRST SEMESTER)
MID SEMESTER EXAMINATION, 2019
(ALL BRANCHES)
BASIC ELECTRICAL ENGINEERING
Time : 1 : 30 Hours
Maximum. Marks : 50

Note :(i) All questions are compulsory.

(ii)- Answer **any** *two* subquestions among (a), (b) and (c) in each main question.

(iii)Total marks for each main question are ten.

1. Attempt any *two* parts of choice from (a), (b) and (c). (2x5=10 Marks)

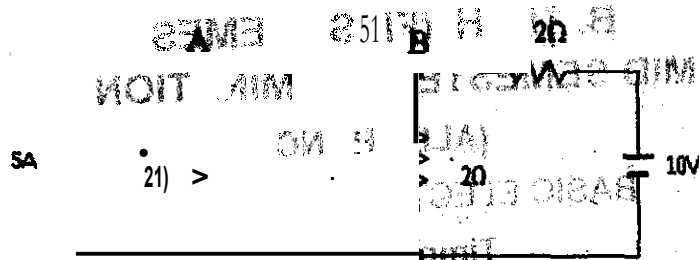(a) State and explain the following laws with suitable example

(i) Ohm's law

(ii) Kirchhoff's current law

(iii) Kirchhoffs voltage law

(b) Find current in each branch of electrical circuit, as shown in Fig **ing node** •voltage method.

(c) **Find current in** fa& **branch,** **shown** ig. . ², using **mesh analysis.** All resistances, **as** indicated in Fig 2, are in
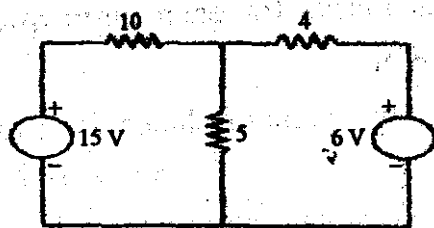

Fig. 2

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

(a) State and explain **Thevenin's** theorem with suitable circuit diagram.

(b) Using **Thevenin's** theorem, calculate current in branch **AB,** as shown in Fig. 3. **All** resistance am in **a.**
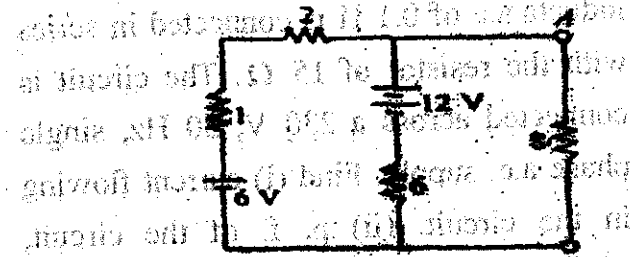

Fig. 3

(c) **Find current, and** I_2 as shown in Fig. 4, **using** mesh analysis.
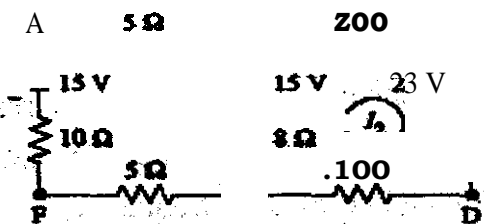

Fig. 4

3. Attempt any *two* parts of choice from (a), (b) and (c). (2x5=10 Marks)

(a) Discuss the following terms :

  (i) IL M. S. value of AC

  (ii) Average value of AC

  (iii) Form factor

  (iv) Peak factor

(b) Determine it M. S. value of full wave rectified current which is obtained from sinusoidal AC with time period T.

(c) A reactor having negligible resistance and inductance of 0.1 H is connected in series -with the resistor of 15 Ω. The circuit is connected across a 230 V, 50 Hz, single phase a.c. supply. Find (i) current flowing in the circuit, (ii) p. 1. of the circuit, (iii) active power (iv) reactive power.

4. Attempt any *two* parts of choice from (a), (b) and (c).

(2x5=10 Marks)

(a) Discuss phenomenon of resonance electrical in circuit having resistance, capacitance and inductance in series. Also, calculate resonance frequency.

(b) A circuit having a resistance of 5 12, an inductance of 0.4 H and a variable capacitance in series, is connected across a 110 V, 50 Hz supply. Calculate (i) the value of capacitance to give resonance, (ii) current under the condition of

resonance; (iii) voltage across the inductance under the resonance condition.

(c) Derive the relation between line and phase voltage in three-phase star-connected balanced system.

5 Attempt any *two* parts of choice from (a), (b) and (c).

(2x5=10 Marks)

(a) Discuss superposition theorem with suitable example,

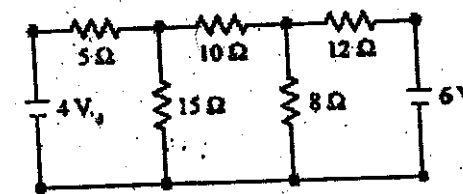(b) Find current in 10 Ω resistance, as shown in Fig. 5, using Superposition theorem.

Fig. 5

(c) An inductance of 50 mH is connected in series with a resistance of 10 0. The voltage applied. to •the circuit is 200 V, 50 Hz.
Calculate (i) impedance, (ii) current in the circuit (iii) p. f. of the circuit.