

Time: 2 Hours

Marks: 60

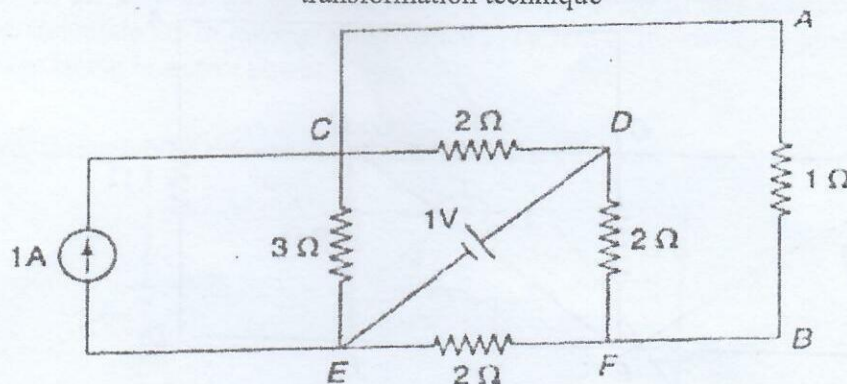
N.B:

- 1) Question **no.1** is compulsory
- 2) Attempt any **THREE** Questions from remaining **FIVE** Questions.
- 3) Assume suitable data if necessary and mention the same clearly.
- 4) Figure on right indicate the marks.

Q1. Answer any **FIVE** questions

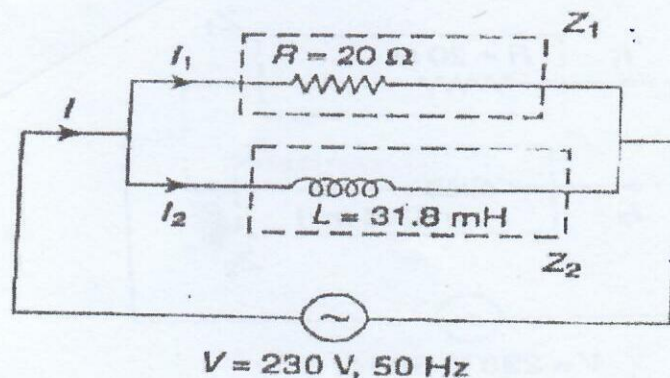
- A State and Explain Superposition Theorem [3]
- B Find RMS and Average value of an alternating current varying sinusoidal takes 1.67 msec to obtain 14.14 A for the first time after becoming instantaneously zero. Time taken by an alternating current to complete it's one cycle is 20 msec. [3]
- C Compare Ideal and Practical transformer. [3]
- D Why single-phase induction motor is not self-starting? [3]
- E Draw & Explain VI characteristics of Zener diode. [3]
- F Write applications of LED. [3]

Q2. A State Superposition theorem. Find $1\ \Omega$ using Superposition theorem without using source transformation technique [10]



B Explain the working principle of three phase induction motor. [5]

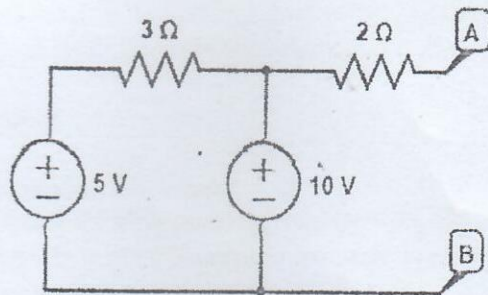
Q3. A A resistance of $20\ \Omega$ and a pure coil of inductance 31.8mH are connected in parallel across a $230\text{V}, 50\text{Hz}$, $1\text{-}\phi$ supply. Find i) The line current ii) Power Factor, iii) Power consumed by circuit. [10]



B Explain the application of Zener diode as a voltage regulator. [5]

A Find Thevenin's and Norton's equivalent circuit across A & B.

[5]



B Write a short note on FET.

[5]

C Derive relation between line & phase voltage and line & phase current in three phase STAR connected balanced circuit.

[5]

Q5. A Explain the working principle and transformation ratio of a single-phase transformer.

[5]

B Write short notes on BLDC motor

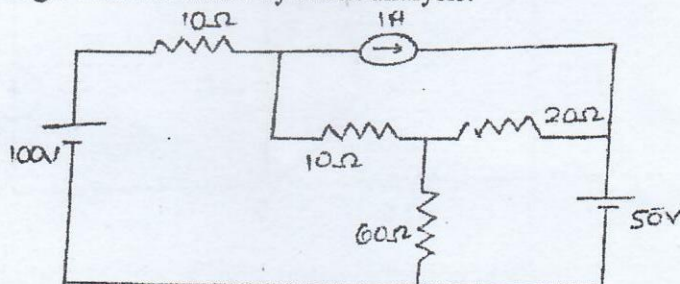
[5]

C A resistor of $20\ \Omega$, an inductor of 0.05H and a capacitor of $50\ \mu\text{F}$ are connected in series combination. Calculate the following 1) Impedance 2) current of the circuit 3) phase difference angle 4) power factor 5) Active power

[5]

Q6. A Obtain current through $60\ \Omega$ resistance by Mesh analysis.

[6]



B State the necessary condition for resonance in a series circuit. Compare series and parallel resonance.

[5]

C Explain the application of BJT as a switch.

[4]
