

**VIT**

Vellore Institute of Technology

Final Assessment Test – Jan/Feb 2023

Course: BEEE102L - Basic Electrical and Electronics Engineering

Class NBR(s): 5269 / 5272 / 5276 / 7327

Time: Three Hours

Slot: A1+TA1

Max. Marks: 100

KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION, IS TREATED AS EXAM MALPRACTICE**Answer any TEN Questions****(10 X 10 = 100 Marks)**

1. Determine the node voltages for the following circuit shown in Fig.1 using nodal analysis.

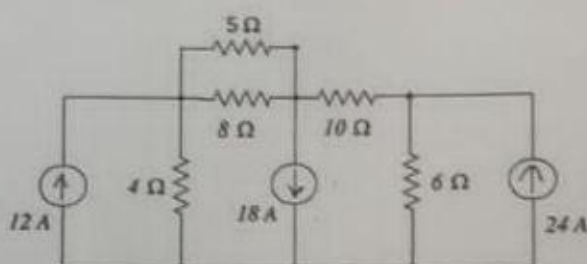


Fig.1

2. In Fig.2, find the current passing through the 10 ohm resistance using Thevenin's theorem.

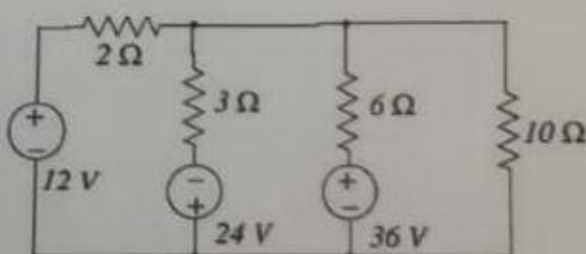


Fig.2

3. In a series RLC circuit given $R = 12 \Omega$, and $C = 250 \mu\text{F}$. The circuit is excited by a sinusoidal voltage source of 230 V, 50 Hz and the circuit draws a current of 8 A. Determine (a) the value of the inductance, L (b) the voltage across various elements (c) active power (d) Reactive and apparent power (e) draw the phasor diagram
4. A 415V, 50Hz three phase source supplies a star connected balanced load through a line impedance of $(2+j4) \text{ ohms}$. The load impedance per phase consists of 10mH inductance and 6Ω resistance connected in series. Calculate (i) Load current in each phase (ii) active power (iii) Reactive power (iv) power factor (v) Apparent power
5. A magnetic core made of cast steel is shown in Fig.3. The core is symmetrical about the Y axis and its central limb carries a coil of 600 turns. Compute the magnitude of the exciting current to produce a flux of 30mWb in either of the side limbs of the core. Assume a square cross section of 1 cm x 1 cm and the relative permeability of 250 for cast steel.