Sub. Code 241AB	Hall Ticket Number										VR24

VIGNAN'S INSTITUTE OF MANAGEMENT AND TECHNOLOGY FOR WOMEN

(An Autonomous Institution)

I-B.Tech.–I-Semester Regular Examinations, February-2025

BASIC ELECTRICAL ENGINEERING

(CSE)

Time: 3 Hours **Max. Marks: 60**

(Answer All Questions)

Note: Question paper consists of Part-A & Part-B.

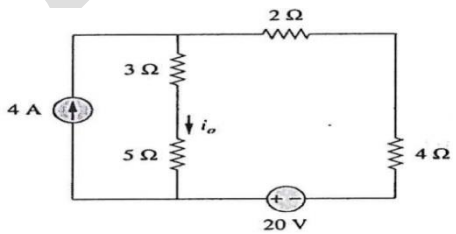
- **Part-A** for 10M, ii) **Part-B** for 50marks
- **Part A** is compulsory, consists of 10 sub questions from all units carrying equal marks.
- **Part-B** consists of **10 questions** (numbered from 2 to 11) carrying **10marks** each. From each unit there are 2 questions and the students should answer one of them. Hence the student should answer **5 questions** from **Part-B**.

PART-A **(10Marks)**

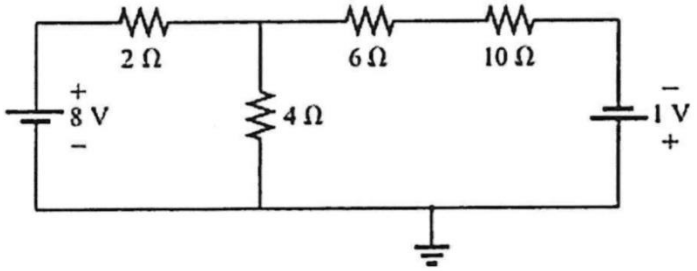
1	a.	What is the difference between mesh and loop?	1M
1	b.	State Nortons theorem and mention its limitation	1M
1	c.	What is meant by resonance?	1M
1	d.	Justify why resistive load is having unity power factor?	1M
1	e.	Distinguish between ideal transformer and practical transformer?	1M
1	f.	What is the condition for maximum efficiency of a single phase transformer?	1M
1	g.	What is the significance of Back EMF in a DC Motor?	1M
1	h.	What is meant by synchronous speed in 3-Phase induction motor?	1M
1	i.	What is the difference between plate earthing and pipe earthing?	1M
1	j.	Justify why batteries stores only DC energy?	1M

PART-B **(10Marks)**

2 a) Solve for current i_0 in the circuit shown below using Superposition theorem **5M**

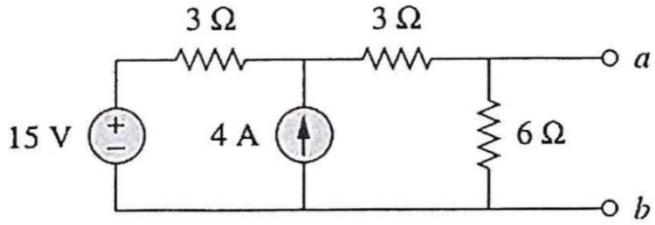


2 b) Solve for the voltage across 6Ω resistor for the circuit shown below: **5M**

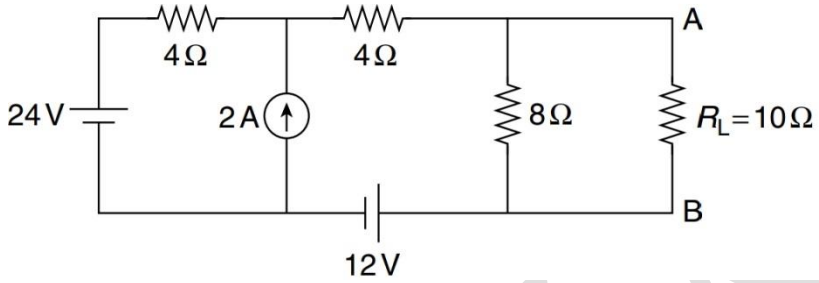


OR

3 a) Develop Nortons equivalent circuit for the circuit shown in the Figure at terminals 'a' and 'b'. **5M**



3 b) Calculate the current through the 10Ω in the circuit shown below using thevenins theorem. **5M**



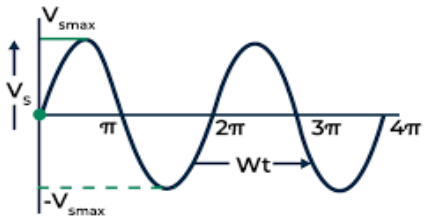
4 a) Derive the expression for impedance, current, power factor, voltage across inductance, voltage across capacitance of R-L series circuit connected to A.C source of single phase supply and draw the phasor diagram. **5M**

4 b) A series circuit comprising R, L and C is supplied at 220V, 50 Hz. At resonance, the voltage across the capacitor is 550V. The current at resonance is 1 A. Determine the circuit parameters R, L and C. **5M**

OR

5 a) Derive the relation between line currents and phase currents in a 3-phase balanced Delta-connected system with a neat phasor diagram **5M**

5 b) Determine the Form factor and Peak factor of voltage waveform shown below: **5M**



6 a) Derive the expression of approximate voltage regulation of a transformer **5M**

6 b) Following are the test results on a 4KVA, 200V/400V, 50Hz single phase transformer. While no load test is carried out from the LV side, the short circuit test is carried out from the HV side. **5M**
No load test: 200V 0.7A 60W
Short Circuit Test: 36V 10A 400W
Calculate the efficiency at full load and 0.8 p.f (lagging).

OR

7	a)	Derive the EMF equation of a 1-Ø transformer.	**5M**
7	b)	Draw and Explain the equivalent circuit of a transformer referred to primary.	**5M**
8	a)	Describe about construction and operating principle of a 3-phase induction motor.	**5M**
8	b)	Draw the torque-slip characteristics of 3-phase induction motor.	**5M**

OR

9	a)	A three phase induction motor is wound for 4 pole and is supplied from 50 HZ system. Calculate i) The synchronous speed ii) rotor speed when slip is 4% and iii) rotor frequency when rotor runs at 600 rpm.	**3M**
9	b)	Explain about the construction of DC Machine and write the procedure for building up of EMF in a DC Machine	**7M**
10	a)	Distinguish between fuse and circuitbreaker in detail	**5M**
10	b)	A consumer uses a 10 kW geyser, 6 kW electric furnace and five 100 watt bulbs for 15 hours. How many units (kWh) of electrical energy have been used? Find the total cost of energy consumption if the cost per unit is Rs. 2.5/-	**5M**

OR

11	a)	Distinguish between ELCB and MCCB	**5M**
11	b)	Calculate the energy consumption for a month having 30 days for the load details given below: (per day details) i)5 tube lights of rating 40W for 4hrs , ii) 4 ceiling fans of rating 80W for 10hrs and iii) Other load of rating 250W for 4hrs.	**5M**

****VMTW*****