Paper / Subject Code: N10415 / Basic Electrical & Electronics Engineering

FE Sem-I (All branches) NEP 2020 3/1/2025

Time: 2 Hours **Max Marks: 60**

N.B.:

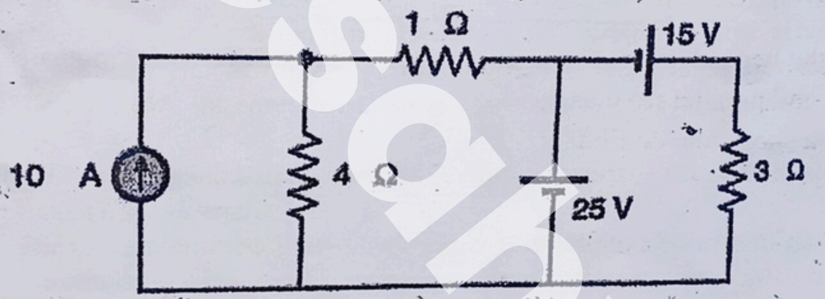
(1) Question No.1 is compulsory.

(2) Attempt any THREE questions from remaining FIVE questions.

(3) Assume suitable data if necessary and mention the same clearly.

(4) Figures on the right indicate the marks.

			Marks
Q.1	a.	Write formulas for Delta to Star and Star to Delta transformation.	3
	b.	An alternating current of frequency 50 Hz has a maximum value of 12 A. Find (i) Equation for instantaneous value of current and (ii) Time taken to reach 9.6 A for the first time.	3
	c.	What is the efficiency of transformer?	3
	d.	State the function of each constructional part of a DC motor.	3
	e.	Write applications of LED.	3
Q.2	a.	Using Superposition theorem, find voltage across 4 Ω resistor.	10



	b.	Explain the working principle of three phase induction motor.	5
Q.3	a.	A coil consumes 1 KW power from 50 Hz single phase ac supply and volt-ampere input is 2 KVA. If value of resistance of coil is 10 Ω then find the following parameters with respect to a coil. (i)Value of inductance, (ii) Phase angle, (iii) Power factor, (iv) Impedance, (v) Voltage and Current equations, (vi) KVAR	10
	b.	Draw and explain the *V-I* characteristics of a Zener diode	5
Q.4	a.	State and prove the Maximum power transfer theorem. Derive the formula of Maximum power delivered.	5
	b.	Explain the application of BJT as an amplifier.	5
	c.	Three similar coils each having a resistance of 5 Ω and an inductance of 0.02 H are connected in star to a 440 V, 50 Hz, 3-phase supply. Calculate (i) line current and (ii) active and reactive power	5

Q.5 a. Explain the working principle and transformation ratio of a single-phase transformer. 6

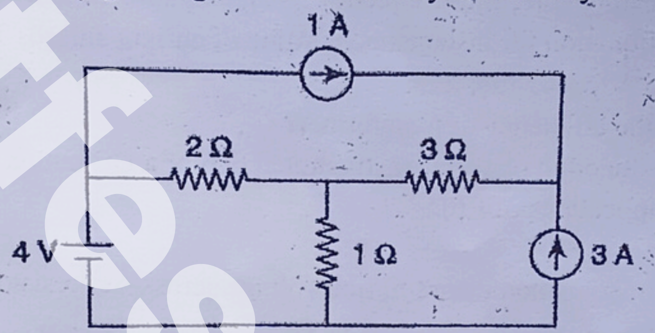
b. Write short note on any one: 4

(i)Single phase induction motor

(ii)BLDC motor.

c. Two impedances of $12 + j16\ \Omega$ and $10 - j20\ \Omega$ are connected in parallel across 230 V, 50 Hz, single phase ac supply. Find admittance, current and power factor of each branch. 5

Q.6 a. Find current flowing through 1Ω resistance by Node analysis. 6



b. State the necessary condition for resonance in a series circuit. Compare series and parallel resonance. 5

c. Write a short note on FET. 4