



Final Assessment Test (FAT) – January/February 2023

Programme	B.Tech.	Semester	Fall Semester 2022-23
Course Title	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	Course Code	BEEE102L
Faculty Name	Prof. M M SRAVANI	Slot	F1+TF1
		Class Nbr	CH2022231700581
Time	3 Hours	Max. Marks	100

Section A (10 X 10 Marks)

Answer All questions

1. Find R_{eq} and I in the given circuit as shown in below Fig.1

[10]

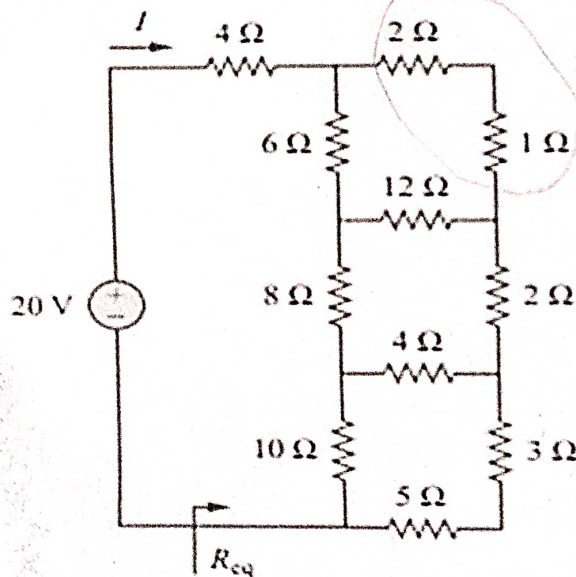


Fig.1

2. For the circuit shown in Fig.2, find the current in the 50 ohms resistor using Superposition theorem.

[10]

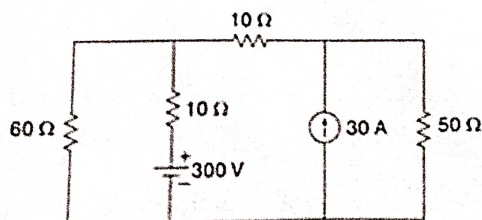


Fig.2

3. In a series circuit containing resistance and capacitance, the current and voltage are expressed as $i(t) = 15 \sin(200 \pi t + 40^\circ)$ A and $v(t) = 440 \sin(200 \pi t - 20^\circ)$ V. Determine the a) Impedance b) Values of resistance and capacitance c) Power Factor. Also d) draw the phasor relation between voltage and current.

[10]

4. Three coils each having resistance of $3\ \Omega$ and inductive reactance of $4\ \Omega$ are connected (i) in star and (ii) in delta to a 415 V, 3 phase supply. Calculate for each connection (a) the line and phase voltages and (b) the phase and line currents. [10]
5. The coils in **Figure 3** have $L_1 = 40\text{ mH}$, $L_2 = 5\text{ mH}$, and coupling coefficient $k = 0.6$. Find $i_1(t)$ and $v_2(t)$ given that $v_1 = 20 \cos(\omega t)$ V and $i_2 = 4 \sin(\omega t)$ A, $\omega = 2,000\text{ rad/s}$. [10]

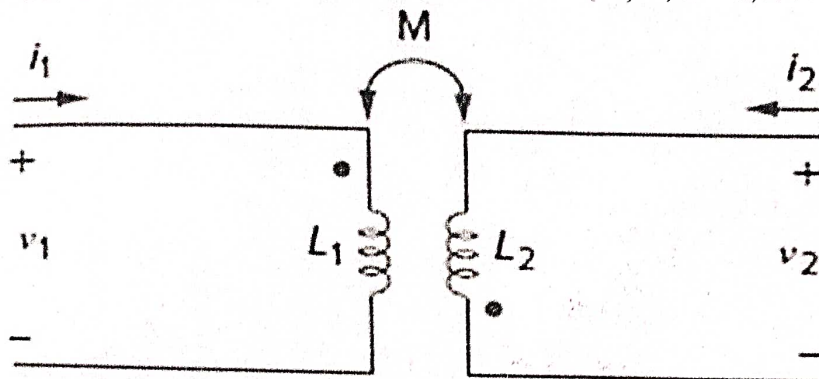
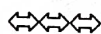


Fig.3

6. Draw a neat sketch of the dc machine and name the parts. Explain the principle of operation of the machine (a) as generator and (b) as motor [10]
7. Explain the working principle and input and output characteristics of BJT as amplifier. [10]
8. Develop the logic circuit necessary to meet the following requirements: [10]
A battery-powered lamp in a room is to be operated from two switches, one at the back door and one at the front door. The lamp is to be ON if the front switch is ON and the back switch is OFF, or if the front switch is OFF and the back switch is ON. The lamp is to be OFF if both switches are OFF or if both switches are ON. Let a HIGH output represent the ON condition and a LOW output represent the OFF condition.
9. With relevant truth table, k-map simplification, and expressions, explain the design of full adder circuit. [10]
10. Compare brushed DC motor and BLDC motor. Explain the construction and working principle of BLDC motor along with its advantages, limitations and applications. [10]



$R = \frac{V_b}{E_b}$
 V_b