VIT
Vellore Institute of Technology

Reg. No. : 22BME1077

Final Assessment Test (FAT) - JUNE/JULY 2023

Programme	B.Tech.	Semester	Winter Semester 2022-23
Course Title	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	Course Code	BEEE102L
Faculty Name	Prof. Jamuna K	Slot	B1+TB1
		Class Nbr	CH2022232300587
Time	3 Hours	Max. Marks	100

Section-A (6 X 10 Marks)
Answer All questions

01. Find the maximum power that can be delivered to the resistor R in the circuit shown in Figure 1. [10]

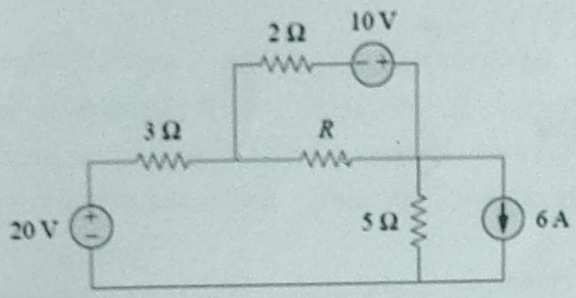

Figure 1

02. Find the node voltages V_a, V_b and V_c for the circuit shown in Figure 2. [10]

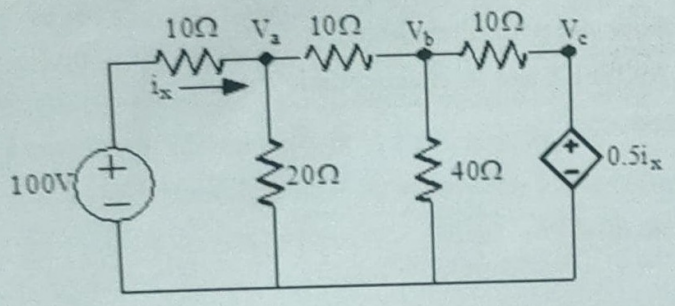

Figure 2

03. An electromagnet in the form of ID is shown in figure 3 and the iron square section 4cm wide. [10]
A flux of 1.1mwb is required in the air gap. Neglecting leakage and fringing, calculate the number of ampere turns required. Take the relative permeability of 2000 at this flux density.

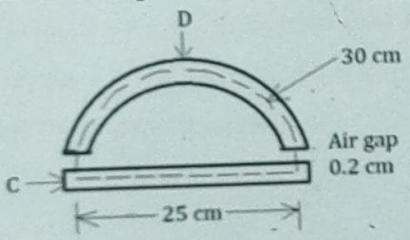

Figure 3

04. A 250V shunt motor runs at 1000 rpm at no-load and takes 8A. The total armature and shunt field resistances are 0.2Ω and 250Ω respectively. Calculate the speed when loaded and taking 50A, assume that the flux to be constant. [10]

05. Explain the operating principle of the stepper motor. Also discuss the various modes in the stepper motor.

06. Implement the Boolean function using 2 X 1 MUX. [10]

$$F = \sum m(1,3,4,6,7,9,10,12,13,14)$$

Section-B (2 X 15 Marks)

Answer All questions

07. Three identical coils having a resistance of 10 ohms and inductance of 42mH are forms as (a) a star (b) a delta. These coils are connected to a voltage source of 415V with phase angle of 0^0 (rms), 50Hz, 3 phase supply. Determine the total power dissipated in each case. [15]

08. The mutual inductance between two coils is M=0.2H for the circuit shown in Figure 4 and the source voltage is $v_s(t) = 12cos10t$ V . Find the current i_1 and i_2. [15]

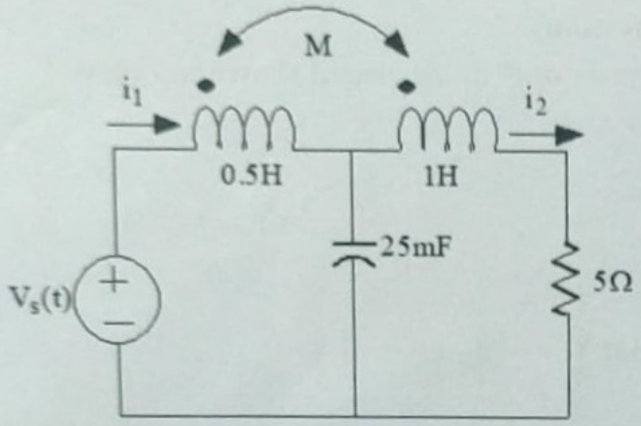

Figure 4

Section-C (2 X 5 Marks)

Answer All questions

09. Discuss the working of a full-wave rectifier without and with filter circuit. [5]

10. Explain the operation of the enhancement type MOSFET and its characteristic curves. [5]

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