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TERM END EXAMINATIONS (TEE) – December 2021- January 2022

Programme	: B. Tech. –	Semester	: Fall 2021-22
Course Name	: Electric Circuits & Systems	Course Code	: EEE1001
Faculty Name	: Mr. Amit Kumar Singh	Slot / Class No	: C11+C12+C13 / 0108
Time	: 1½ hours	Max. Marks	: 50

Answer ALL the Questions

Q. No.	Question Description	Marks
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PART - A (30 Marks)

- 1 (a) Determine the current I in 5-ohm resistor of the circuit given in **Fig.1** using **Norton** theorem 10

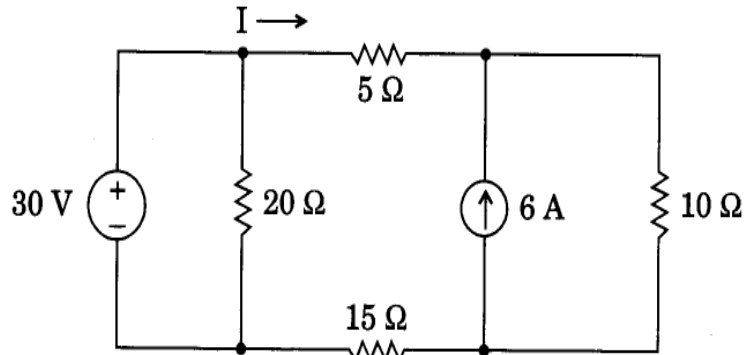


Fig.1

OR

- (b) Describe the transient behavior of first order R-L circuit given in **Fig.2** for different positions of switch S 10

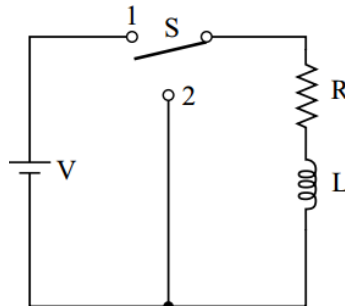


Fig.2

- 2 (a) For the transformer given in **Fig.3**, derive the equation for induced E.M.F E_1 and E_2 . Also draw the phasor diagram for no load condition considering $N_2 > N_1$. 10

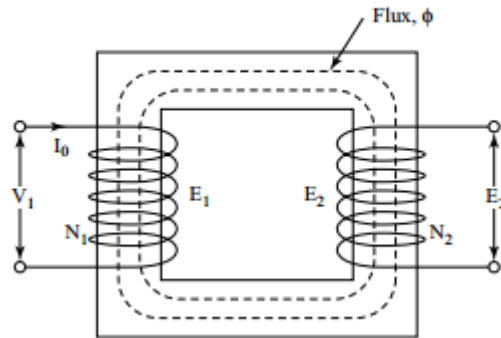


Fig.3
OR

- (b) For the circuit shown in **Fig.4**, draw the output waveform v_o when 10
- (i) Diodes (Si) are ideal
 - (ii) Diode (Si) are approximate ideal
 - (iii) Diode (Si) are practical with forward resistance $R_f = 1\Omega$

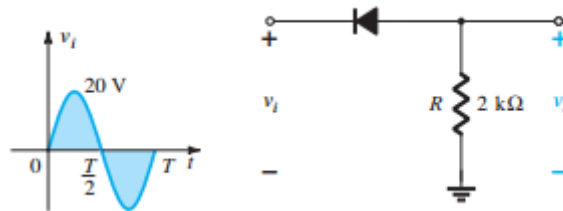


Fig.4

- 3 (a) Explain the working of common Emitter NPN transistor with the help of input output characteristics curve. Why BJT^s are referred as bipolar device while FET^s are referred as unipolar device explain? 10

OR

- (b) Explain the logic of full adder and design it using 3: 8 Decoder 10

PART - B (20 Marks)

- 4 Transform the given magnetic circuit into analogous electrical circuit and calculate the flux produced in the air gap in the magnetic circuit shown in **Fig. 5**, which is excited by the MMF of two windings. The mean length of the flux path is 40 cm. The permeability of iron is 2000. The uniform core cross-sectional area is 10 cm^2 . 10

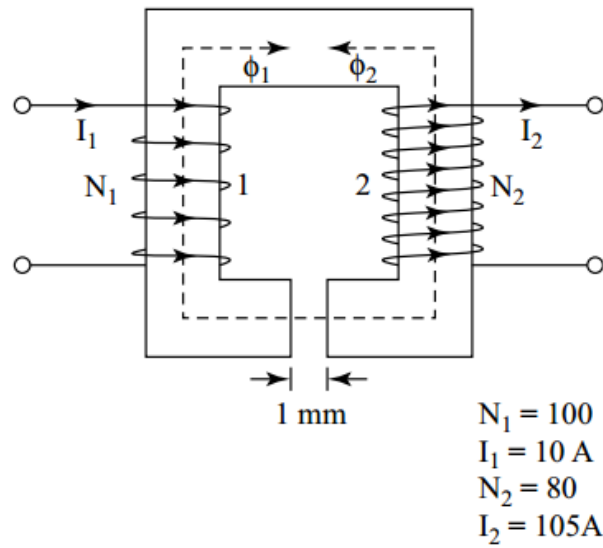


Fig.5

- 5 Design a synchronous counter using J-K -Flip flop which can count the following cycle 10 given in **Fig.6**.

