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

Programme	: B.Tech	Semester	: Fall 2021-22
Course	: ELECTRIC CIRCUITS AND SYSTEMS	Code	: EEE1001
Faculty	: Prof. Mayank Gupta	Slot/ Class No.	: F11+F12+F13/0063
Time	: 1 ½ hours	Max. Marks	: 50

Answer ALL the Questions

Q. No.	Question Description	Marks
PART - A (30 Marks)		
1	<p>(a) Two batteries A and B are connected in parallel to a load of 10Ω. Battery A has an EMF of 12 V and an internal resistance of 2Ω and Battery B has an EMF of 10 V and internal resistance of 1Ω. Using nodal analysis to determine the current supplied by each battery and the load current, as shown in figure 1.</p> <p align="center">Figure 1</p>	10
OR		
	<p>(b) A rectangular shape iron core has an air gap of 0.10 cm. The mean length of the flux path through iron is 15 cm. The relative permeability of iron is 3000. The coil has 2500 turns. The cross-sectional area of the core is 2 cm. Calculate the current required to produce a flux of 4 mWb in the core.</p>	10
2	<p>(a) Draw and identify the difference between DC Motor and Induction motor and clearly identify which of the parts in are rotating and which of them are stationary.</p>	10
OR		
	<p>(b) A single turn coil of radius 2 cm is carrying a current of 10A. Calculate</p> <p>(i) The flux density at the centre of the coil.</p> <p>(ii) The flux density in the perpendicular plane at a distance of 10 cm from the coil.</p>	10
3	<p>(a) Distinguish between an intrinsic and extrinsic semiconductor material. What is a p-type material and an n-type material?</p>	10
OR		

	(b) Design a half adder using NOR – NOR logic also explain the truth table.	10
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PART - B (20 Marks)

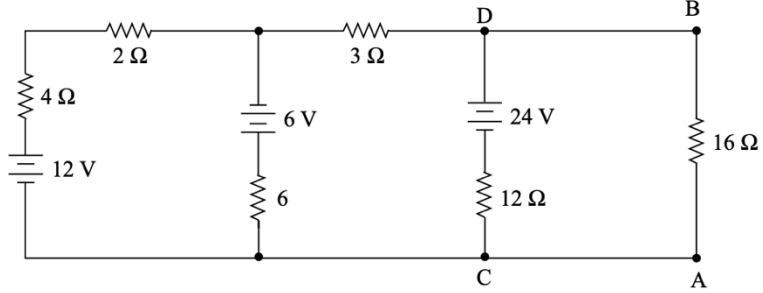
4	<p>By applying Thevenin's as well as Norton's theorem show that current flowing through the $16\ \Omega$ resistance in the following network is 0.5 A, as shown in figure 2.</p> 	10
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Figure 2

5	Design a 1×4 de-multiplexer using AND and NOT gate configuration, explain how data selection input works with truth table.	10
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