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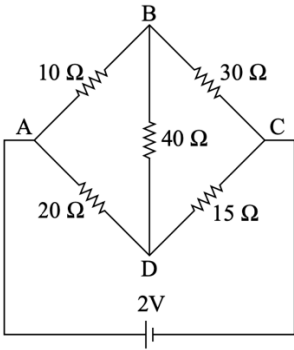
**TERM END EXAMINATIONS (TEE) – December 2021- January 2022**

Programme	: <b>B.Tech</b>	Semester	: <b>Fall 2021-22</b>
Course	: <b>ELECTRIC CIRCUITS AND SYSTEMS</b>	Code	: <b>EEE1001</b>
Faculty	: <b>Prof. Mayank Gupta</b>	Slot/ Class No.	: <b>D11+D12+D13/0057</b>
Time	: <b>1 ½ hours</b>	Max. Marks	: <b>50</b>

**Answer ALL the Questions**

Q. No.	Question Description	Marks
<b>PART - A ( 30 Marks)</b>		
1	<p>(a) Apply Norton's theorem to determine the current flowing through the resistance of <math>6\ \Omega</math> connected across the terminals. A and B. Also calculate the potential of point A. What will be the current through the <math>6\ \Omega</math> resistor across AK as shown in figure 1.</p> <p align="center">Figure 1</p>	10
OR		
	<p>(b) A series-connected DC motor has an armature resistance of 3.0 ohm and field winding resistance of 2.5 ohm. In driving a certain load at 1200 rpm, the current drawn by the motor is 12A from a voltage source of <math>V_T = 120V</math>. The rotational loss is 440W. Find the output power and efficiency.</p>	10
2	<p>(a) A rectangular shape iron core has an air gap of 0.02 cm. The mean length of the flux path through iron is 10 cm. The relative permeability of iron is 1500. The coil has 1000 turns. The cross-sectional area of the core is 5 cm. Calculate the current required to produce a flux of 2 mWb in the core.</p>	10
OR		
	<p>(b) Draw and clearly identify which of the parts in DC Motor are rotating and which of them are stationary. Explain importance of each part.</p>	10
3	<p>(a) Draw and explain the circuit for a bridge rectifier and draw the input and output voltage waveforms.</p>	10
OR		
	<p>(b) Design a 4x1 multiplexer using AND and OR gate configuration, explain how data selection input works with truth table.</p>	10

**PART - B (20 Marks)**

4	<p>The resistance of the various arms of a Wheatstone bridge are shown in Figure 2. The battery has an EMF of 2 V and negligible internal resistance. Using Thevenin's theorem, determine the value and direction of the current in the galvanometer circuit BD.</p>  <p style="text-align: center;">Figure 2</p>	10
5	<p>Design a half adder using NAND – NAND logic also explain the truth table.</p>	10
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