	Reg. No.:	
	Name :	

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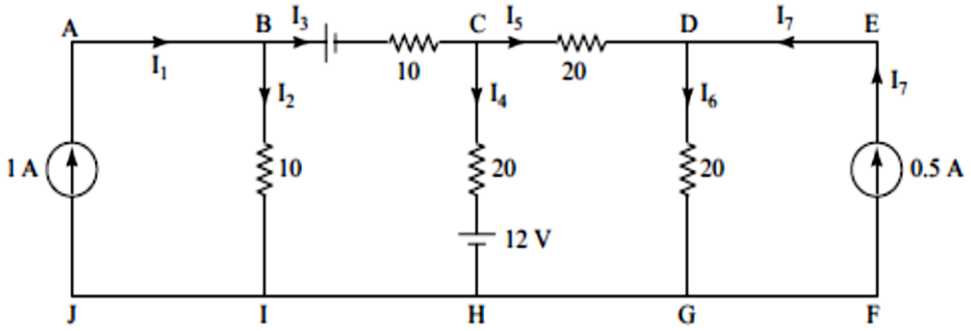
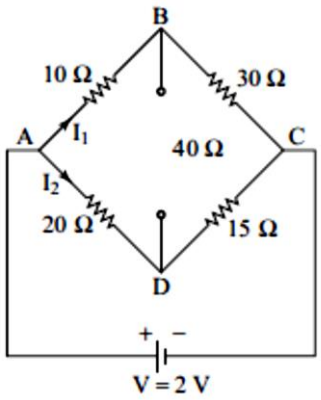
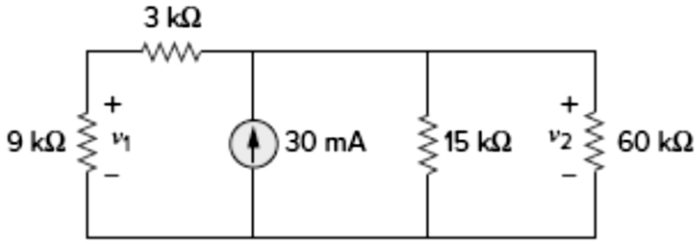
Mid-Term Examinations – October 2021

Programme	:	**B.Tech (All)**	Semester	:	**Fall 2021-22**
Course	:	**Electric Circuits and Systems**	Code	:	**EEE1001**
Faculty	:	**Dr. Soumitra K Nayak**	Slot/ Class No.	:	**E11+E12+E13/0118**
Time	:	**1 ½ hours**	Max. Marks	:	**50**

Answer all the Questions

Q. No.	Sub. Sec.	Question Description	Marks
1		Use nodal analysis to determine the current flowing through the various branches in the circuit as shown in Fig-1. All resistances shown are in Ohms.  Figure - 1	**10**
2	(a)	The resistance of the various arms of a Wheatstone bridge are shown in Fig-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.  Figure – 2	**10**

3		Find: (a) V_1 and V_2 as shown in Fig-3, (b) the power dissipated in the 3-kΩ and 15-kΩ resistors, and (c) the total power supplied by the current source.  Figure - 3	**10**
4		A half-wave rectifier circuit has been made using a step-down transformer of turn ratio 50:5. The input voltage is v = 220sinωt and the diode's forward resistance is 25Ω. A load resistance of 1.4 KW has been connected in the circuit. Assuming a secondary winding resistance of the transformer as 1.1KΩ, calculate: (a) Rms value of load current (b) rectification efficiency, and (c) ripple factor.	**10**
5	a.	Explain the operation of an enhancement type n-channel MOSFET with its characteristics graph.	**5**
	b.	In an n–p–n transistor in the common emitter configuration, an ac input signal of ± 50 mV is applied. The dc current gain, βdc and ac current gain βac are 90 and 120, respectively. Calculate the voltage amplification, A_V of the amplifier. The I_B versus V_{BE} characteristic is such that for V_B = 0.7V, I_B = 17mA and for Vi = ± 50mV, I_b = ±7 mA. Also calculate the dc collector voltage.	**5**
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