Reg. No.:

Name :

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

Programme	:	**B.Tech [BAC, BAI, BAS, BCE, BCG, BEC, BHI, BMR, BOE, BSA, MEI]**	**Semester**	:	**Fall 2021-22**
Course Name	:	**Electric Circuits and Systems**	**Course Code**	:	**EEE1001**
Faculty Name	:	**Dr. Baldev Swamy**	**Slot / Class No**	:	**E21+E22+E23/0085**
Time	:	**1½ hours**	**Max. Marks**	:	**50**

Answer ALL the Questions

Q. No.		Question Description	Marks
		PART - A (30 Marks)	
1	(a)	Solve the given network circuit shown in Fig. 1 by using Nodal analysis to find V1, V2, V3 and V4 and also find the current passing through each branches of resistor elements?	10

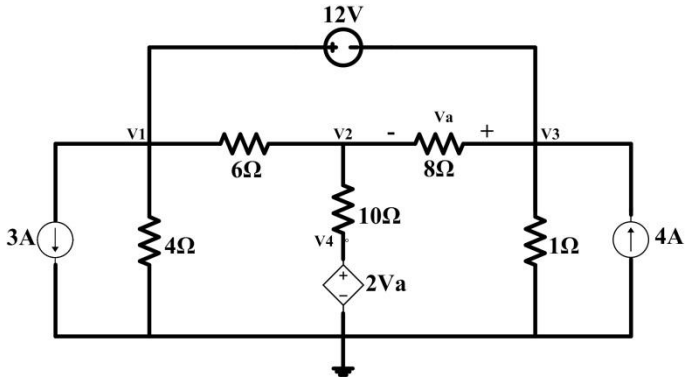

Fig. 1

OR

	(b)	A horse-shoe-type iron-core electromagnet is wound with 1000 turns and is required to lift heavy iron bars of 100 kg each time. The area of a cross section of each of the poles of the horseshoe magnet is 0.01 m^2. The mean length of the flux path through the electromagnet is 0.5 m. The relative permeability of the flux path is 2000. Calculate the value of the excitation current through the coil.	10
2	(a)	The maximum flux density in the core of a 1100/220 V, 50 Hz, 100 kVA transformer is 3.5 Wb/m2. Calculate the area of cross section of the core and the number of turns of the primary and secondary windings if the EMF per turn is 5.5 V.	10
		OR	
	(b)	Calculate the a.c. voltage required to a half-wave rectifier supplied by 75V d.c. to a resistive load of 650 Ω shown in below Fig. 2. The diode has a resistance of 15 Ω.	10

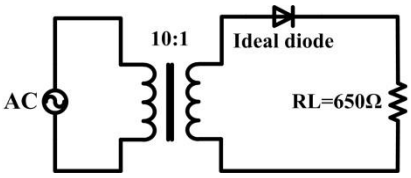

Fig. 2

3 (a) Evaluate the voltage gain of the given below circuit by using the CB configuration and consider the alpha (α) value is 1 shown in below Fig. 3? 10

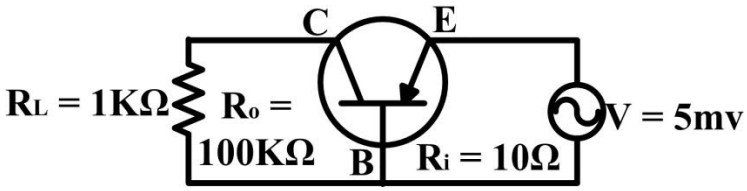

Fig. 3

OR

(b) Analyse the characteristics of the device which is like a heavily doped PN junction diode to conduct in the reverse direction when a certain specified voltage reached. 10

PART - B (20 Marks)

4 In the given below Fig. 4, switch is open since a long time and it is closed at t =0. Find the current i(t) for $t \geq 0^+$ 10

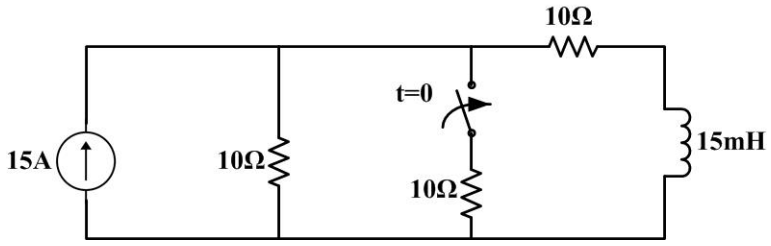

Fig. 4

5 Design a combinational logic circuit that produces the product of two numbers $A = (a1\ a2)$ and $B = (b1\ b2)$. The product is in the form $P = (p1\ p2\ p3\ p4)$ where $a1, b1\ and\ p1$ are the most significant digits. Give the expressions of $p1, p2, p3\ and\ p4$ and simplify using Karnaugh-maps. 10

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