VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test – I

Winter Semester 2019-20

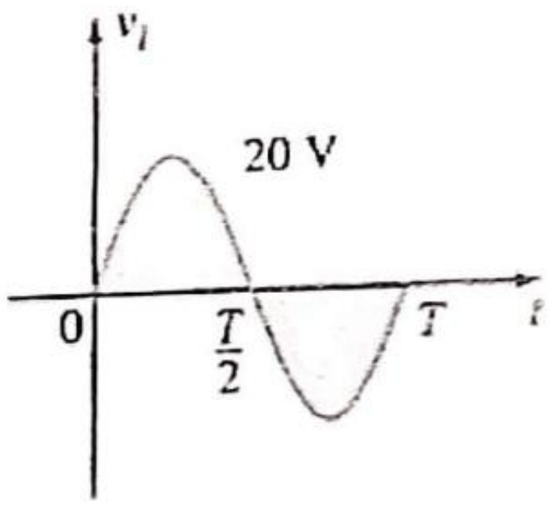
Programme Name & Branch: B.Tech – EEE & EIE **Date & Slot:** 19-1-2020 & A1

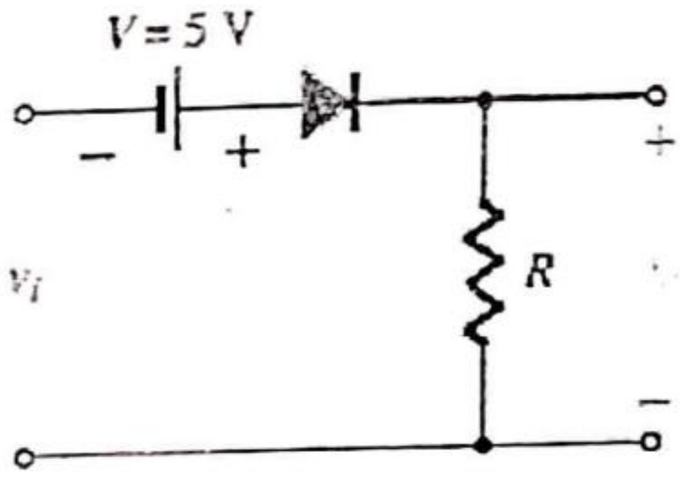
Course Name & Code: Semiconductor Devices & Circuits –EEE2002

Exam Duration:1.5 Hrs **Maximum Marks:**50

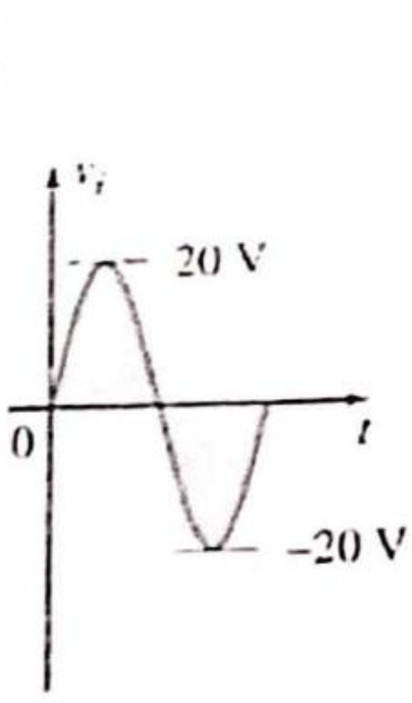
Faculty Name :Prof. G.K.Rajini/Prof.G. Vidhya Sagar /Prof.M.N. Venkataraman/Prof. Washima Tasnin

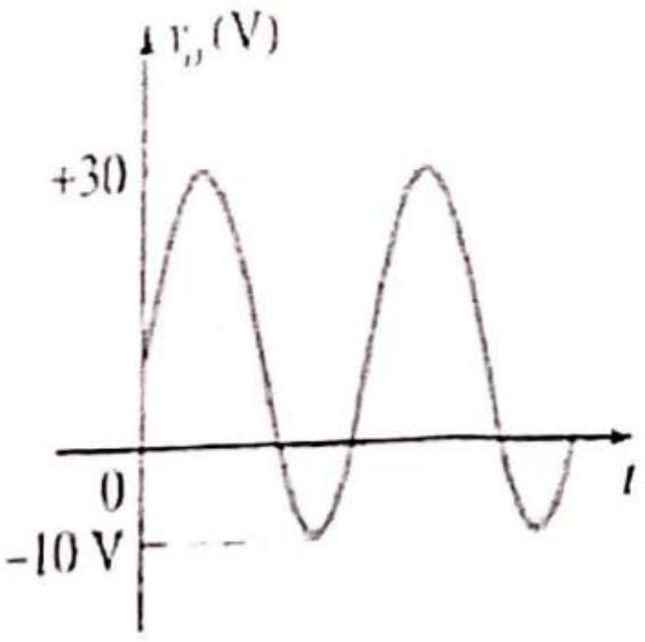
S.No.	Questions
1.	With necessary explanation discuss the characteristics of PN junction diode and elaborate on Drift and Diffusion currents in it. [10Marks]
2. a.	For the given input signal & Clipper circuit, sketch the output voltage v_0 for the following specifications shown below. [5Marks]

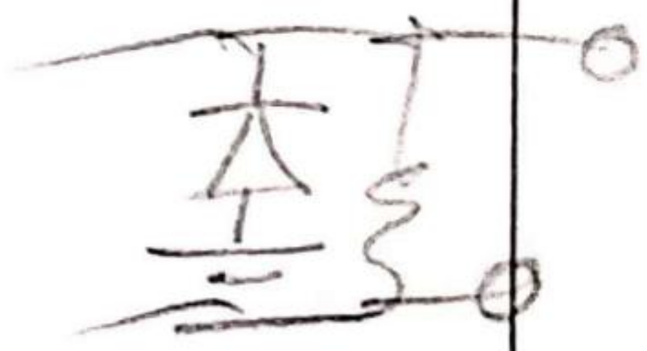




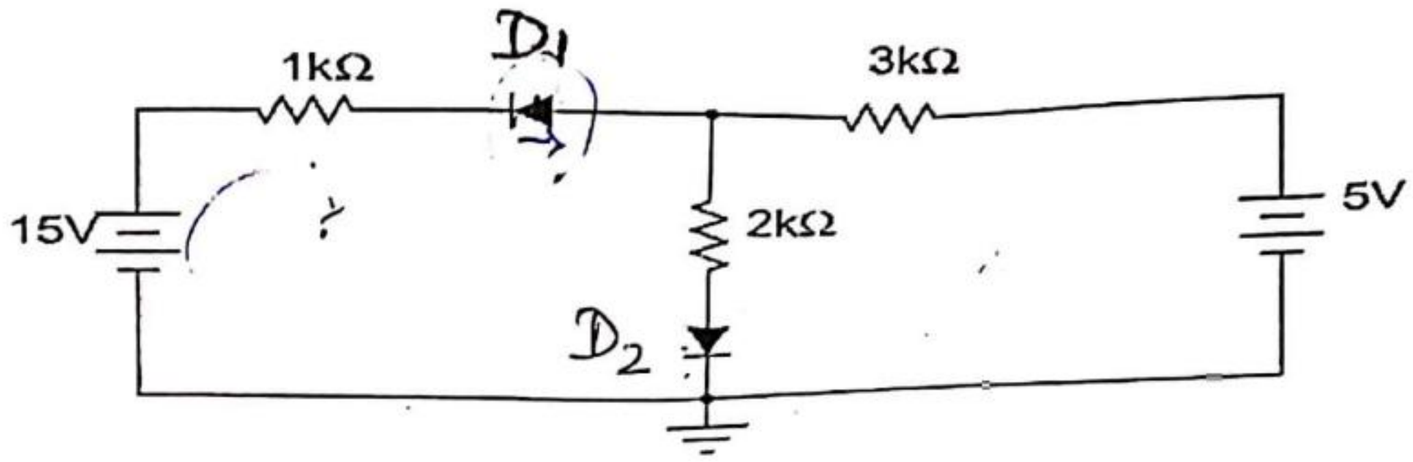
2.b. Design a clamper circuit using PN diode for the given input and output sinusoidal signal shown below. [5 Marks]



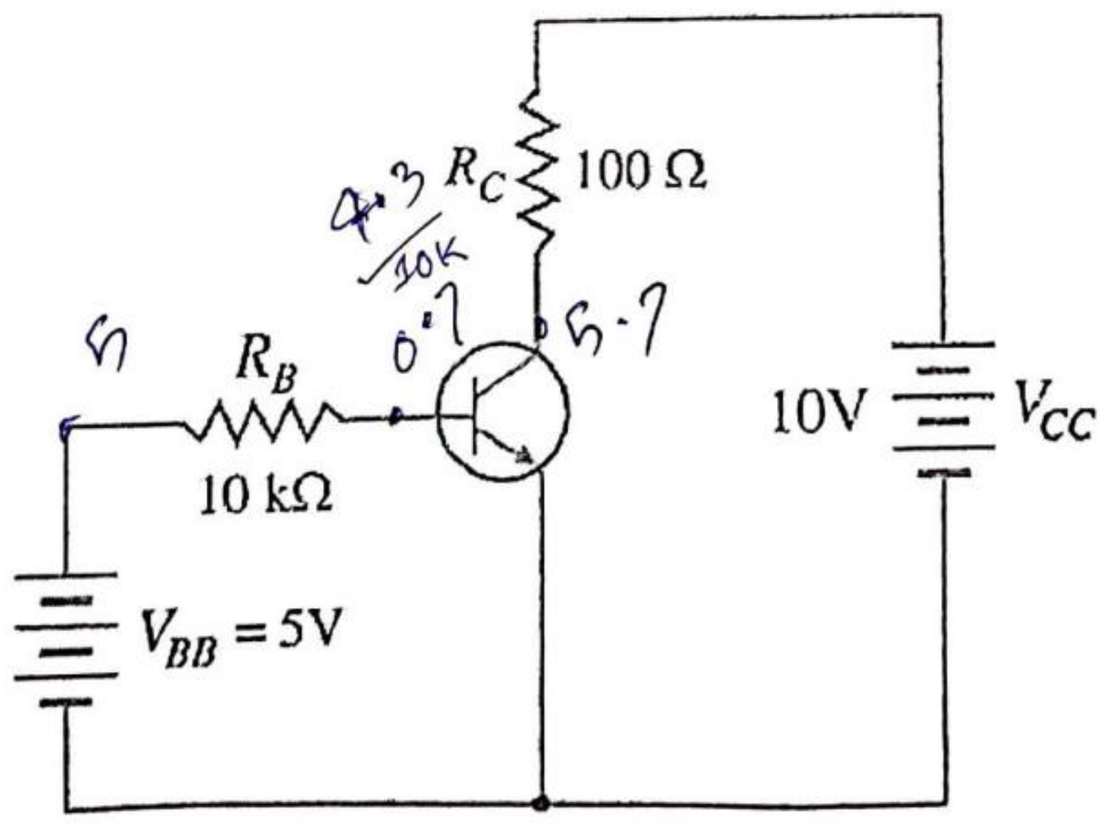




3.	The Silicon PN diode in the circuit given below is specified with following voltages. Find the currents flowing through the diodes D_1 *and* D_2. [10Marks]



4.	Explain the operation of BJT and explain its input & output characteristics of CE configuration and various operating regions. [10Marks]
5.	Determine the operating region of transistor and also the currents and voltages for the given circuit below. Given $\beta = 100$ and $V_{BE(on)} = 0.7v$ $i)I_B$ $ii)I_c$ $iii)$ $I_E iv)V_{CE}$ $v)V_{CB}$ [10 Marks]



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SCHOOL OF ELECTRICAL ENGINEERING

CAT I

Discipline	: **B.Tech**	Semester	: **Winter 2020**
Subject Code	: **EEE2001**	Max. Marks	: **50**
Subject Name	: **Network Theory**	Time	: **1 ½ hours**
Slot	: **B1+TB1**	**Date:**	**:20.01.2010**

Instructions: **Answer ALL questions**

1 Use the node-voltage method to find the branch currents I_a, I_b, I_c and I_x in the circuit shown in Fig. 1. **[10]**

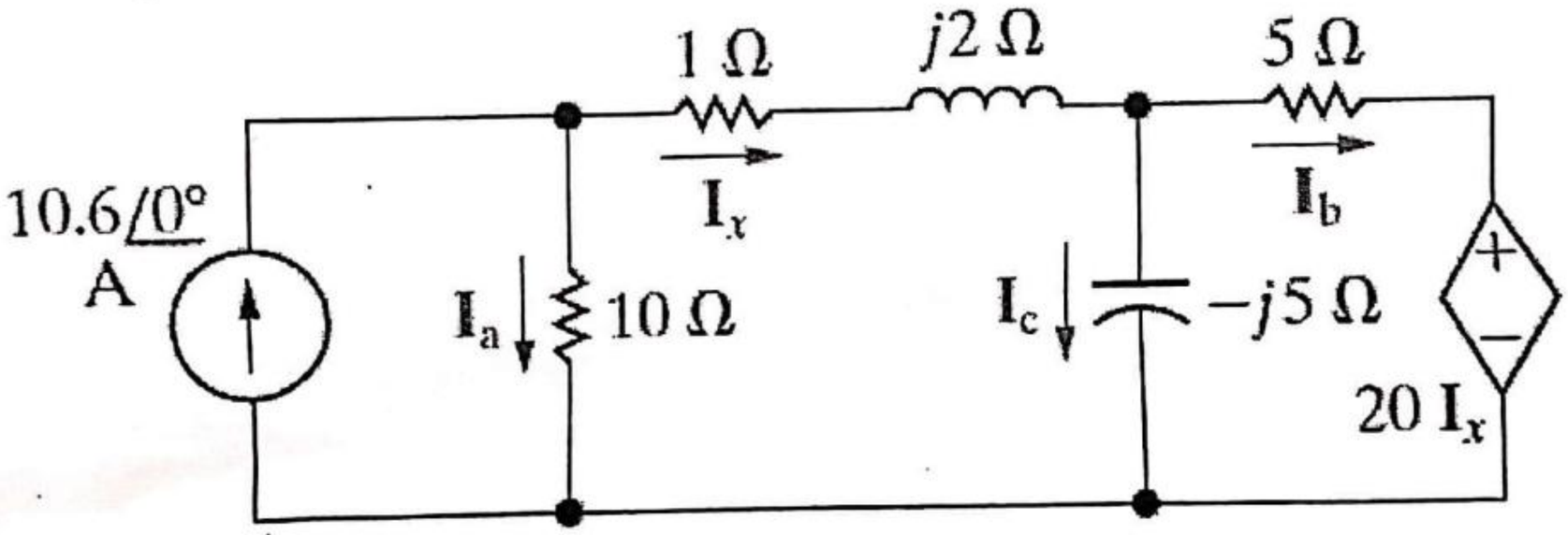

Fig. 1

2 In Fig. 2, the resistor R_L is adjusted until it absorbs the maximum average power. Calculate R_L and the maximum average power absorbed by it. **[10]**

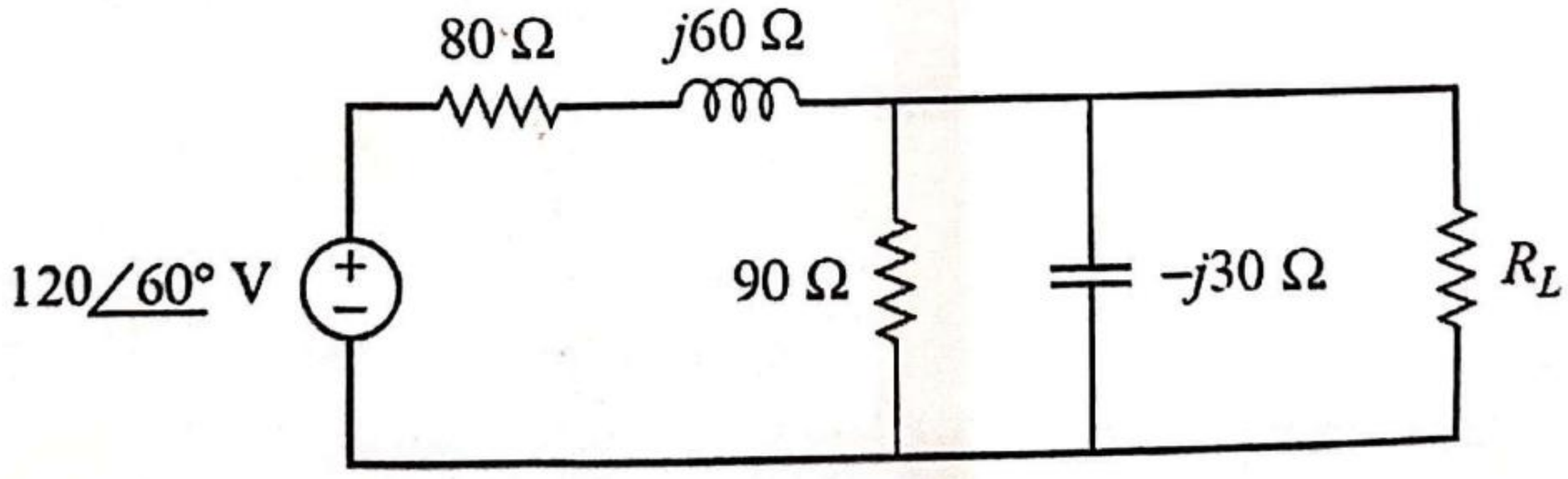

Fig. 2.

3 Solve for $v_o(t)$ in the circuit of Fig. 3 using the superposition principle. [10]

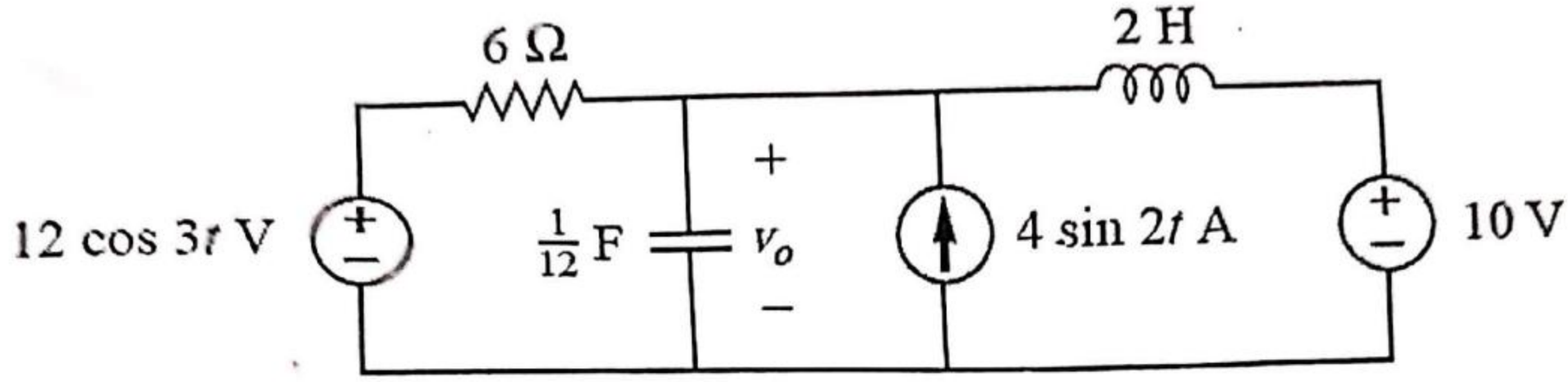

Fig. 3

4 Determine $i_o(t)$ in the circuit in Fig. 4. assuming zero initial conditions. [10]

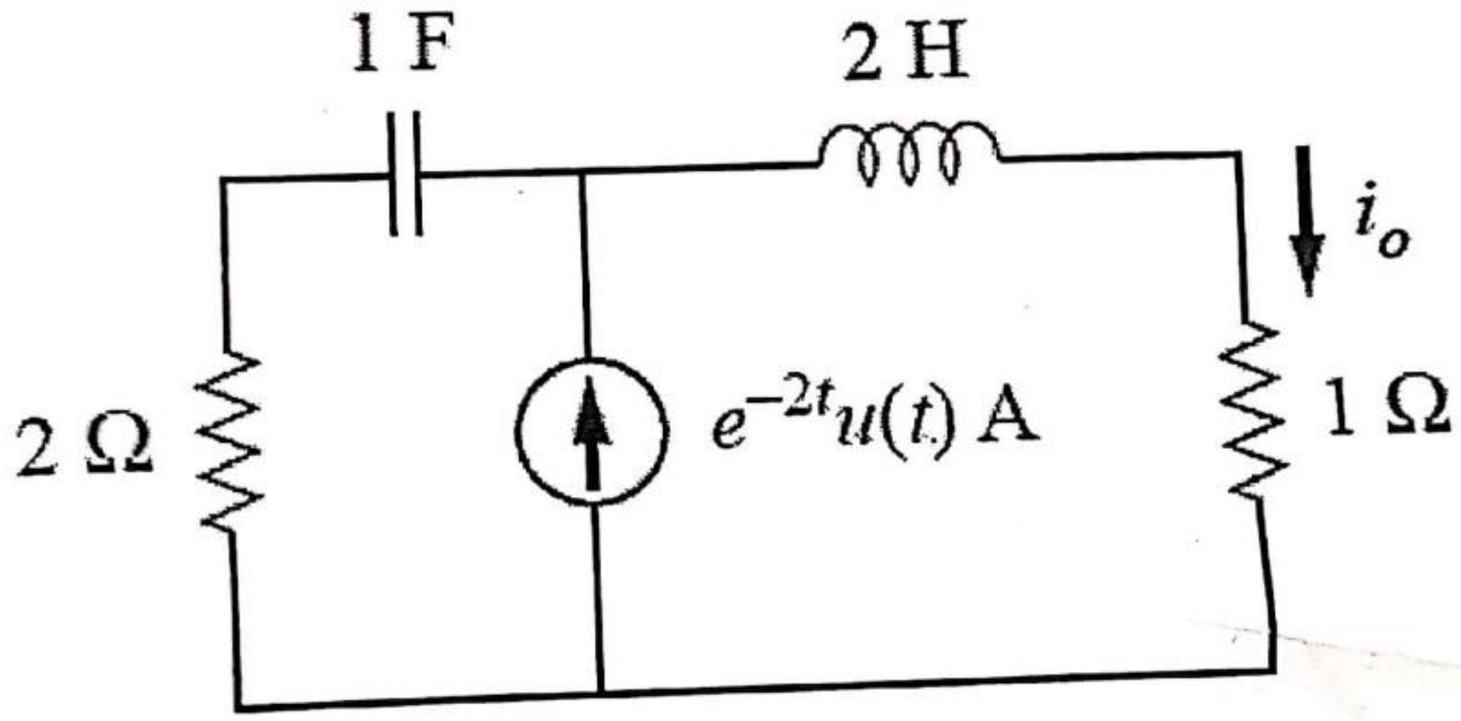

Fig. 4

5 Consider the parallel *RLC* circuit of Fig. 5. Find $v(t)$ and $i(t)$ given that $v(0) = 5$ V and $i(0) = -2$ A. [10]

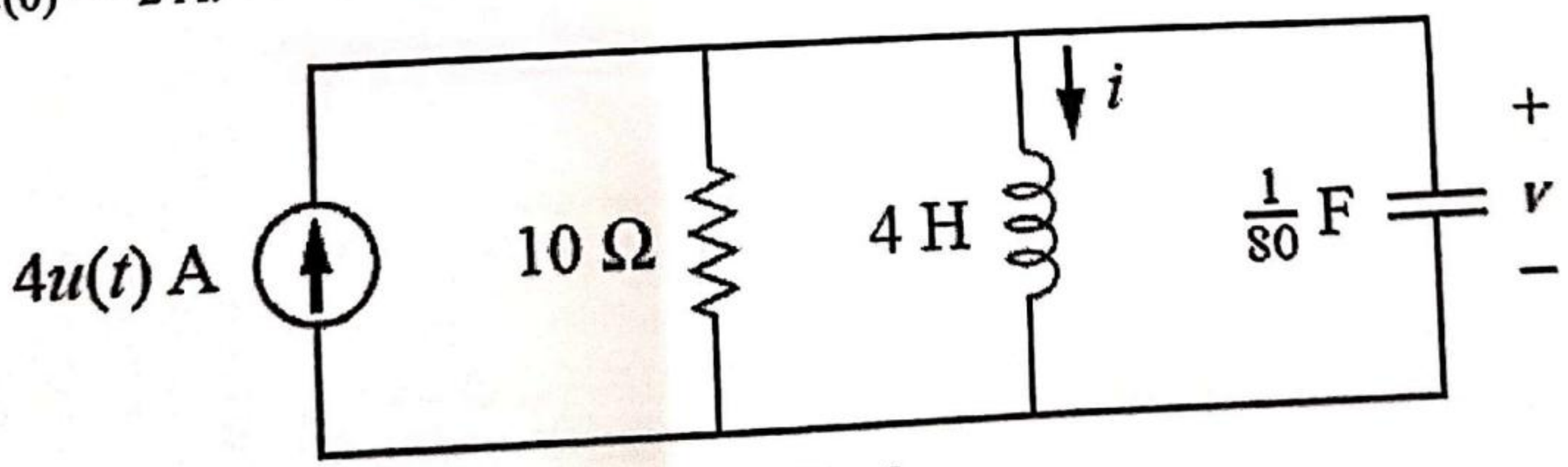

Fig. 5

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Continuous Assessment Test – I

Programme Name & Branch : B.TECH (EEE,ECE,EIE and MECH)

Course Name & Code : Engineering Electromagnetics, EEE 1004

Slot: C1+TC1 **Exam Duration:** 1:30 Min **Max. Marks:** 50

Faculty: Dr. V. Indragandhi , Dr. Venkatesh .S, Dr. C. Rani and Dr. Himadri Lala

Answer all questions (5*10 = 50 Marks).

No.	Question
1.	Express the Cartesian unit vector $\hat{a}_x$ in Spherical coordinate systems at the point T (2,3,-4).
2.	State Gauss's Divergence Theorem. Verify Gauss's Divergence Theorem for the vector field $\vec{A} = xy^2\hat{a}_x + y^3\hat{a}_y + y^2z\hat{a}_z$ defined on the closed cubic region defined by $0 \le x \le 1, \quad 0 \le y \le 1, \quad 0 \le z \le 1$.
3	Point charges 5 nC and 2 nC each are located at A (2, 0, 4), B (−3, 0, 5) respectively. a) Determine the force on a 1 nC point charge which is located at C (1,3,-7) b) Find the electric field at C (1,3,-7)
4	A point charge 100 pC is located at (4, 1, -3) while the x-axis carries a line charge of 2 nC/m. If the plane $z = 3$ also carries charge of 5 nC/m^2, calculate E at (1,1,1).
5	Determine the electric field everywhere due to a uniformly charged sphere of radius 'x' and total charge q. Make a rough plot of the magnitude of the electric field with respect to the distance from the center of the sphere.