GBPHT121- PHYSICS FOR ELECTRICAL SCIENCE
QUESTION BANK

MODULE 1			
Sl.No	**Questions**	**Marks**	**KTU, Year**
1	Define fermi energy. Give the significance of fermi level.	3	KTU DEC 2024
2	Distinguish between intrinsic and extrinsic semiconductors.	3	KTU DEC 2024
3	Derive diode equation.	6	KTU DEC 2024
4	At what temperature, the probability of a state to be occupied by an electron is 2 %. Given that the energy of the state is 0.1eV above the fermi level.	3	KTU DEC 2024
5	Derive an expression for density of holes in the valence band of an intrinsic semiconductor.	6	KTU DEC 2024
6	Calculate the intrinsic carrier concentration for silicon at 300 K with a band gap of 1.1 eV. Given m n * = 0.12 m e and m p * = 0.28 m e	3	KTU DEC 2024
7	Derive the expressions for concentration of holes in valance band.	6	Model question
8	What is a pn junction. Explain the flow of current across pn junction in forward bias and revers bias conditions.	3	Model question
9	What are intrinsics and extrinsic semiconductors?	3	Model question
10	What is the meaning of forward biasing of a p-n junction diode?	3	Model question
MODULE-2			
1	Write a short note on semiconductor lasers.	3	KTU DEC 2024
2	Explain stringing of solar cells.	3	KTU DEC 2024

3	Explain the working and VI characteristics of a tunnel diode.	6	KTU DEC 2024
4	In a centre tap full wave rectifier each diode has an internal resistance of 10 Ω. The transformer rms secondary voltage from centre tap to each end of secondary is 50 V and load resistance is 980 Ω. Find mean load current and rms value of load current.	3	KTU DEC 2024
5	Explain the working of a solar cell and draw its IV characteristics. Define fill factor and efficiency.	6	KTU DEC 2024
6	Calculate the band gap energy of the semiconductor material used in an LED which emits light of wavelength 654 nm.	3	KTU DEC 2024
7	With neat labelled diagram explain the working of i) centre tap full wave rectifier and ii) full wave bridge rectifier.	6	Model question
8	Draw V-I characteristics of Zener diode and Tunnel diode.	3	Model question
9	Explain the working of LEDs. Write any six advantages of LED	6	Model question
10	Write a short note on stringing of solar cells	3	Model question
	MODULE -3		
1	What are dielectric materials? Give 2 examples.	3	KTU DEC 2024
2	Superconductors are perfect diamagnets. Justify.	3	KTU DEC 2024
3	Derive Clausius- Mossotti relation.	6	KTU DEC 2024
4	If the electric field strength inside two parallel plates of a capacitor is 10 4 V/m due to a dielectric medium of dielectric constant 3, find the polarisation vector. □0=8.85 × 10−12 □ 2 /□□2	3	KTU DEC 2024
5	Define superconductivity, critical field and critical temperature. Write the relation connecting critical field and critical temperature.	6	KTU DEC 2024
6	Explain any 3 applications of superconductors.	3	KTU DEC 2024
7	Compare type I and type II superconductors . .	6	Model question

8	Calculate the relative permittivity of KCl, when it is subjected to an electric field 1000 Vm-1 and the resulting polarisation is 4x10-8 Cm-2 .	3	Model question
9	Explain the working of PIN photodiodes.	3	Model question
10	Explain the Meissner effect. Prove that a superconductor is a perfect diamagnet.	3	Model question
	MODULE -4		
1	Distinguish between spontaneous emission and stimulated emission.	3	KTU DEC 2024
2	Mention any 6 applications of optical fibres.	3	KTU DEC 2024
3	Write short note on population inversion, pumping, metastable state and optical resonator in a laser system.	6	KTU DEC 2024
4	Briefly explain any three applications of laser.	3	KTU DEC 2024
5	With the help of neat block diagram explain a typical fibre optic communication system.	6	KTU DEC 2024
6	The refractive index of core and cladding for a step index fibre are 1.53 and 1.39 respectively. Find its numerical aperture and acceptance angle.	3	KTU DEC 2024
7	Explain the construction and working of Ruby laser	6	Model question
8	Derive the numerical aperture of optic fiber	3	Model question
9	An optical fiber has a core of refractive index 1.48 and a cladding of refractive index 1.47. Calculate its numerical aperture and acceptance angle.	3	Model question
10	Compare spontaneous emission and stimulated emission	3	Model question

QUESTION BANK

Second Semester

GYMAT201: MATHEMATICS FOR ELECTRICAL SCIENCE AND PHYSICAL SCIENCE 2

Module 1			
Sl. No	**Questions**	**Marks**	**KU/KTU**
1	(a) Given $f = e^x siny + e^y cosx$, show that the function satisfies the Laplace equation $f_{xx} + f_{yy} = 0$ (b) Show that the equation $u(x,t) = sin(x - ct)$, satisfies wave equation $\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$	3+3	**KTU** Apr 2018 Dec 2021 Dec 2023
2	Let $w = 4x^2 + 4y^2 + z^2$, where $x = \rho\ sin\varphi\ cos\theta$, $y = \rho\ sin\varphi\ sin\theta$, $z = \rho\ cos\varphi$. Find $\frac{\partial \omega}{\partial \rho}, \frac{\partial \omega}{\partial \phi}, \frac{\partial \omega}{\partial \theta}$ using chain rule.	7	**KTU** Apr 2018 Dec 2021 Dec 2023
3	Locate all relative extrema and saddle points of the function $f(x, y) = 2xy - x^3 - y^2$	7	**KTU** Apr 2018 Dec 2019 Dec 2023
4	(a) The radius and height of a right circular cone are measured with errors of at most 1% and 4% respectively. Use differentials to approximate the maximum percentage error in the calculated volume. (b) The length and width of a rectangle are measured with errors of at most $r\%$, where r is small. Use differentials to approximate the maximum percentage error in the calculated length of the diagonal.	7+7	**KTU** Dec 2019 Sept. 2021 Dec 2023
5	(a) Find the local linear approximation L to the function $f(x, y) = \sqrt{x^2 + y^2}$ at the point P(3, 4). Compare the error in approximating f by L at the point Q (3.04, 3.98) with distance PQ. (b) Find the local linear approximation L of $f(x, y, z) = xyz$ at the point $P(1,2,3)$. Compute the error in approximation f by L at the point $Q(1.001, 2.002, 3.003)$.	7+7	**KTU** Dec 2019 Sept. 2021 Dec 2023

6	(a) Let , $w = f(P, Q, R)$ where $P = \frac{x}{y}$, $Q = \frac{y}{z}$, $R = \frac{z}{x}$ prove that $$x\frac{\partial w}{\partial x} + y\frac{\partial w}{\partial y} + z\frac{\partial w}{\partial z} = 0$$ (b) Let f be a differentiable function of three variables and suppose that $w = f(x - y, y - z, z - x)$, show that $$\frac{\partial w}{\partial x} + \frac{\partial w}{\partial y} + \frac{\partial w}{\partial z} = 0$$	7	**KTU** Dec 2019 Sept. 2021 Dec 2023
7.	(a) If $f(x, y) = xe^y + 5y$. Find the slope of $f(x, y)$ in the x-direction at (4,0). (b) Find the slope of the surface $z = \sqrt{x^2 + 4y^2}$ in the x-direction at the point (1,-2) and y-direction at (3,2).	3+3	**KTU** Dec 2019 Sept. 2021 Dec 2023
8	Locate all relative maxima, relative minima and saddle point of $f(x, y) = x^4y^2(12 - x - y)$.	7	**KTU** Dec 2019 Dec 2023
9	Given the function $W = xy + z$. Use chain rule to find the instantaneous rate of change of W at each point along the curve $x = cos\ cos\ t$, $y = sin\ sin\ t$, $z = t$.	3	**KTU** Apr 2018
10	Find $f_x(1,3)$ and $f_y(1,3)$ for the function $f(x, y) = 2x^3y^2 + 2y + 4x$.	3	**KTU** Apr 2018 Dec 2019 Sept 2021
Module 2			
1	(a) Find the mass of the square lamina with vertices (0, 0), (1, 0), (1, 1) and (0, 1) and density function $x^2 y$. (b) Find the Mass of the lamina with density $\delta(x, y) = x + 2y$ is bounded by the x-axis, the line $x = 1$ and the curve $y^2 = x$. (c) Find the mass and center of gravity of the lamina in the first quadrant bounded by the circle $x^2+y^2 = 1$ and the coordinate planes with density function xy.	3+3+7	**KTU** Apr 2018 Dec 2019 Dec 2021 Dec 2023
2	Evaluate $\int_{-2}^{2} \int_{-\sqrt{4-y^2}}^{\sqrt{4-y^2}} e^{-(x^2+y^2)}\, dxdy$ by changing to polar coordinates.	7	**KTU** Apr 2018 Dec 2019

			Dec 2021
3	Find the area bounded by the parabolas $y^2 = 4x$ and $x^2 = \frac{y}{2}$	7	**KTU** Apr 2018 Dec 2019 Dec 2021
4	(a) Change the order of integration and hence evaluate $\int_0^1 \int_{x^2}^{2-x} dydx$ (b) Evaluate $\int_0^1 \int_y^1 \frac{x}{x^2+y^2} dx\, dy$ by reversing the order of integration.	7	**KTU** Dec 2020 Dec 2021 Dec 2023
5	Find the volume bounded by the cylinder $x^2+y^2 = 9$ and the planes $y + z = 3$ and $z = 0$.	7	**KTU** Dec 2020 Dec 2021 Dec 2023
6	(a) Evaluate $\int_1^a \int_1^b x^2y\, dx\, dy$ (b) Evaluate $\int_0^3 \int_0^2 \int_0^1 xyz\, dx\, dy\, dz$	3+3	**KTU** Dec 2020 Dec 2021 Dec 2023
7	Use double integral to find the area of the plane region enclosed by the curves $y = \sin x$ and $y = \cos x$ for $0 \le x \le \frac{\pi}{4}$.	3	**KTU** Dec 2020 Dec 2021
8	Evaluate $\int \int_R \frac{\sin y}{y} dA$, where R is the triangular region bounded by the y-axis, $y = x$ and $y = \pi$.	7	**KTU** Dec 2020 Dec 2021
9	Use triple integral to find the volume of the solid within the cylinder $x^2 + y^2 = 9$ and between the planes $z = 1$ and $x + z = 5$.	7	**KTU** Dec 2020 Dec 2021
10	By converting into polar coordinates evaluate $\int_{-1}^1 \int_0^{\sqrt{1-x^2}} (x^2 + y^2)^{\frac{3}{2}} dy\, dx$	7	**KTU** Dec 2023
Module 3			
1	If $f(x,y,z) = x^2i - 3j + yz^2k$ find div F	2	KTU Apr-2018

2	Find the divergence and curl of the vector field $f(x,y,z) = yz\vec{i} + xy^2\vec{j} + yz^2\vec{k}$	2	KTU Apr-2018 & Dec-2017
3	Evaluate $\int_c (3x^2 + y^2)\,dx + 2xydy$ along the circular arc C given by $x = cost,\ y = sint$ for $0 \le t \le \frac{\pi}{2}$	3	KTU Dec-2017
4	Show that the integral $\int_{(1,1)}^{(3,3)} (e^x logy - \frac{e^y}{x})dx + \left(\frac{e^x}{y} - e^y logx\right) dy$ where x and y are positive, is independent of path and find its value.	5	KTU Dec-2017
5	If $\vec{r} = x\vec{i} + y\vec{j} + z\vec{k}$ and $r = \lvert\vec{r}\rvert$, then show that $\nabla f(r) = \frac{f'(r)}{r}\vec{r}$.	5	KTU Dec-2017
6	Find the directional derivative of $f(x,y) = x^2 + 3xy + y^2$ at the point P(2,1)in the direction of $\vec{a} = \frac{1}{3}\vec{i} + \frac{2}{3}\vec{j}$	3	KTU-June 2022
7	Show that $f(x,y) = (cosy + ycosx)\vec{i} + (sinx - xsiny)\vec{j}$ is a conservative vector field. Hence find the scalar potential for it.	5	KTU Dec-2017
8	Find the work done by the force field $F(x,y,z) = xy\vec{i} + yz\vec{j} + xz\vec{k}$ along C where C is the curve $r(t) = t\vec{i} + t^2\vec{j} + t^3\vec{k}$	7	KTU April 2018
9	(a) Find the parametric equation of the tangent to the curve $\vec{r}(t) = 2cos\pi t\vec{i} + 2sin\pi t\vec{j} + 6t\vec{k}\ \ at\ t = \frac{1}{3}$ (c) Show that the vector field $\vec{f}(x,y) = 2xy^3\,\vec{i} + 3y^2x^2\vec{j}$ is conservative and find ϕ such that $\vec{f} = \nabla\phi$. Hence evaluate $\int_{(2,-2)}^{(-2,0)} 2xy^3dx + 3y^2x^2dy$	7+7	KTU-June 2022
10	(a) Find the position and velocity vectors of the particle, given $\vec{a}(t) = (t+1)^{-2}\vec{j} + e^{-2t}\vec{k}, \vec{v}(0) = 3\vec{i} - \vec{j}, \vec{r}(0) = \vec{k}$	7	KTU-June 2023

Module 4			
1	Using Greens theorem, find the work done by the force field $\vec{f}(x,y) = (e^x - y^3)\vec{\imath} + (cosy + x^3)\vec{\jmath}$ on a particle that travels once around the unit circle $x^2 + y^2 = 1$ in the counter clockwise direction	5	KTU Apr-2018
2	If σ is any closed surface enclosing a volume V and $F = x\vec{\imath} + 2y\vec{\jmath} + 3z\vec{k}$, using divergence theorem show that $\iint_\sigma F.nds = 6\,V$.	3	KTU Apr-2018
3	Using line integral evaluate the area enclosed by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$	2	KTU Dec-2017
4	Evaluate $\int_C (x^2 - 3y)dx + 3xdy$, where C is the circle $x^2 + y^2 = 4$	3	KTU Dec-2017
5	Using Stokes theorem evaluate $\int_c f.dr$ where $F = xz\,i + 4x^2y^2j + xy\,k$, C is the rectangle $0 \le x \le 1, 0 \le y \le 3$ in the plane $z = y$.	5	KTU DEC-2017
6	Using Divergence theorem evaluate $\iint_S F.nds$ where $F = (x^2 + y)i + z^2j + (e^y - z)k$ and S is the surface of the rectangular solid bounded by the co-ordinate planes $x = 3,\ y = 1,\ z = 3$	5	KTU Apr-2018
7	Find the circulation of $F = (x - z)i + (y - x)j + (z - xy)k$ using Stokes theorem around the triangle with the vertices A(1,0,0), B(0,1,0) and C(0,0,1).	7	KTU Dec 2017
8	Use Divergence theorem to find the outward flux of the vector field $F = 2xi + 3yj + z^3$k across the unit cube bounded by $x = 0, y = 0, z = 0, x = 1, y = 1, z = 1$	7	KTU June 2023
9	Determine whether the vector fields are free of sources and sinks, if it is not locate them. (i) $(y + z)i - xz^3j + x^2siny\,k$ (ii) $xy\,i - 2xyj + y^2\,k.$	5	KTU Dec-2017
10	(a) Use Green's theorem to find the work done by the force field	7+7	KTU-June 2022

	$\vec{f}(x,y) = xy\vec{i} + \left(\frac{x^2}{2} + xy\right)\vec{j}$ on a particle that starts at (4,0) transverse the upper semicircle $x^2 + y^2 = 16$ and returns to the starting point along X axis. (b) Find the mass of the lamina that is the portion of the cone $z = \sqrt{x^2 + y^2}$ that lies between the planes $z = 1$ and $z = 3$, if the density is $\phi(x,y,z) = x^2 z$.		

GXEST 203 FOUNDATION OF COMPUTING FROM HARDWARE ESSENTIALS TO WEB DESIGN

MODULE 1			
Sl.No.	**Questions**	**Marks**	**KTU, Year**
1	How does the form factor of a motherboard affect the compatibility of hardware components?	3	
2	How do firmware updates improve the functionality and security of hardware devices?	3	
3	a) With a block diagram explain the architecture of CPU? b) How does pipe-lining in CPUs enhance processing efficiency, and what are its limitations?	9	
4	Compare and contrast HDDs and SSDs in terms of performance, storage capacity, and cost	9	
5	a) What is a motherboard, and what are its main components? b) Discuss the role of ALU in executing program instructions	9	
6	What is the role of the bootloader in the boot process?	9	
7	How does the installation of a new interface card affect the system's performance?	9	

MODULE 2			
1	Add the hexadecimal numbers A2F and 4B7, Express the result both in hexadecimal and decimal	3	
2	Design a simple 3 stage-pipeline for a CPU and explain how the instruction flows occur across Fetch, Decode, Execute, stages.	3	
3	a) How do you convert a decimal number to binary? Provide an example b) Convert 1024 bytes to kilobytes, and 1 gigabyte to megabytes.	9	
4	a) Explain the two's complement representation and how it is used for signed integer representation b) How many bits are there in one byte, and how many bytes in one kilobyte?	9	
5	Explain the purpose of opcodes in an instruction format. Give examples of some basic opcodes.	9	
6	What are operands in an instruction? How do they relate to the operation performed by the CPU?	9	
7	a) What is the difference between direct and indirect addressing in instruction formats? b) Explain the concept of binary representation. Why is binary used in computers?	9	

MODULE 3			
1	What are the main difference between 32 bit and 64 bit pc operating system	3	
2	What are the potential risk of relying solely on DHCP in a network	3	
3	a)Analyze the risks and benefits of third party utility programs. What measures should users take to ensure safety when using such tools	9	
4	What are DHCP and NAT, and how do they contribute to network management?	9	
5	Explain the key functions of an operating system and its types and how it manages computer resources.	9	
6	Compare and contrast the different types of computer communications networks, including LAN, MAN, and WAN, and discuss their typical use cases.		
7	Explain the concepts of IP addresses, DHCP, and NAT, and how they work together in a network		

MODULE 4			
1	Compare X HTML with HTML5 ? what are the key differences and why did HTML5 become the preferred standard	3	

2	Discuss the structure and significance of HTML in Web development. How does it serve as the foundation for the modern web.	3	
3	a) What are the key elements of HTML? b) What is the role of CSS in web design?	9	
4	a) What are the main features of JavaScript? b) How does web content delivery work?	9	
5	Create a basic HTML page with the following elements: A title "My First Web Page". A heading "Welcome to My Web Page". A paragraph describing the purpose of the page. An image with a source URL. A hyperlink to an external website.	9	
6	Explain the purpose and structure of CSS selectors and provide examples of different types of selectors.	9	
7	Describe the role of CSS in web design, including how it enhances the appearance and layout of web pages	9	

Course Code: GXEST 204

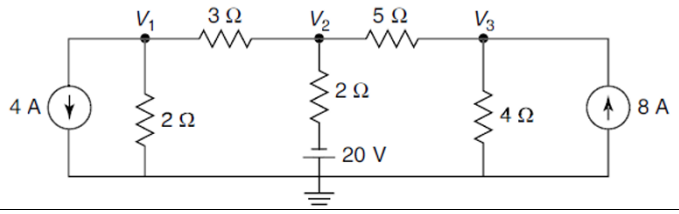
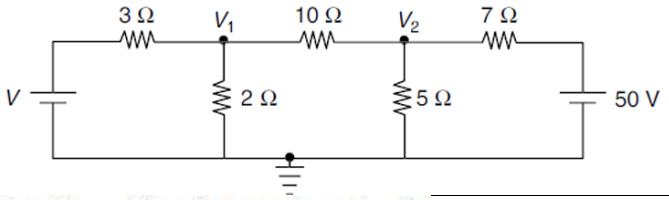
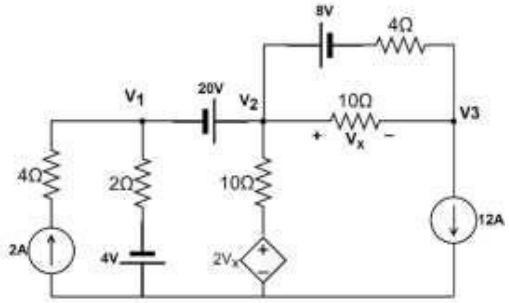
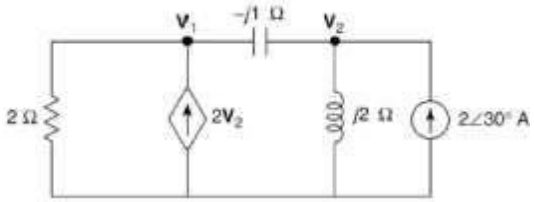
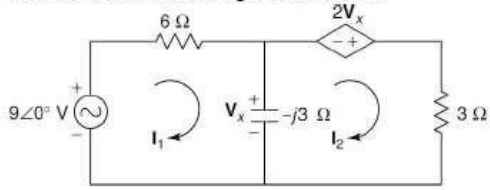
Course Name: PROGRAMMING IN C

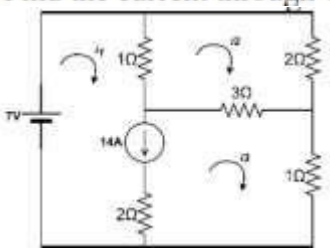
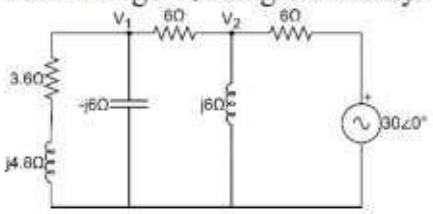
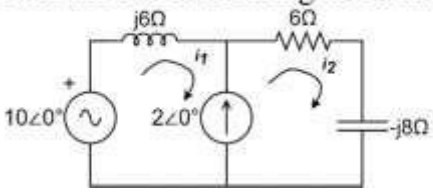
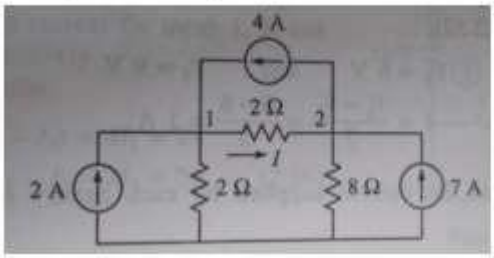
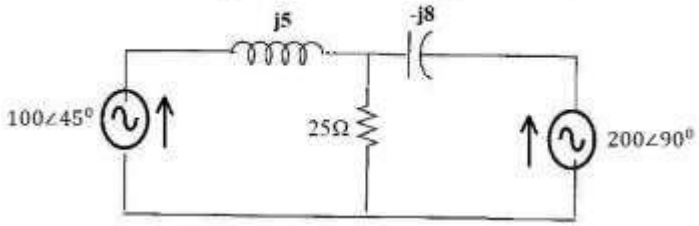
Module I			
1.	Write a menu driven program to find the area of square, triangle, circle and rectangle according to the choice given.	10	June 2023
2.	Differentiate between break and continue statements using an example.	4	June 2023 May 2024
3.	Explain any four types of operators used in C	7	June 2023 Jan 2024 May 2024
4.	Write a program to generate the following pattern 1 1 2 1 2 3 1 2 3 4	7	June 2023
5.	Give the syntax of switch statement. Write a program to check whether a given number is positive, negative or zero using switch.	3	Jan 2024
6.	Write a c program to check whether a counting number is prime or not.	6	Jan 2024 May 2024
7.	with suitable examples describe the conditional statements in c.	8	Jan 2024
8.	Explain various datatypes used in C programming language.	3	May 2024
9.	Write a C program to find the sum of digits of a given number.	3	May 2024
10.	Write a C program to implement basic arithmetic operations of a calculator using switch constructs.	7	May 2024
Module II			
1.	Explain any 4 string handling functions in C programming.	7	July 2021 June 2022 Jan 2024 May 2024
2.	Write a C program to sort an array of numbers using bubble sort	7	June 2022
3.	What are the different ways of declaring and initializing a single and multi dimensional arrays?	3	June 2023 Jan 2024 May 2024
4.	Implement string concatenation without using built in functions.	8	June 2023 May 2024
5.	Write a C program to accept a 2-D integer matrix and check whether it is symmetric or not (A matrix ‘A’ is symmetric if $A=A^T$).	6	June 2023

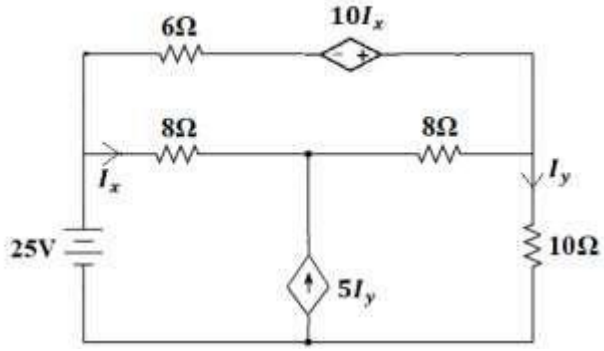
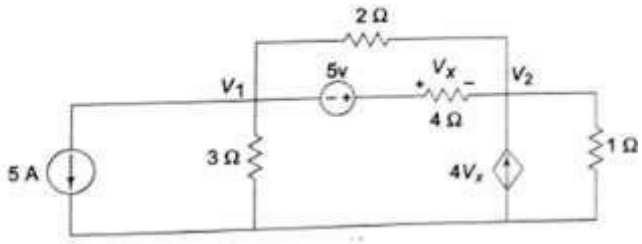
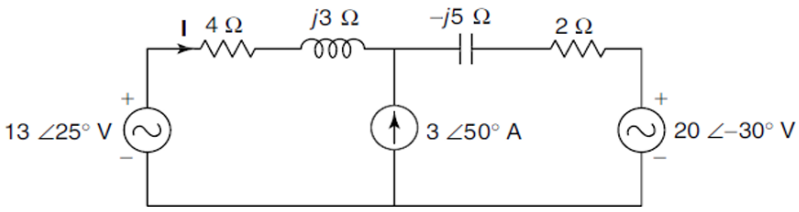
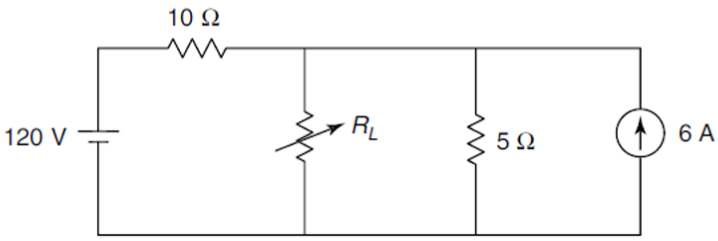
6.	Write a program to print the product of two matrices	8	June 2023 Jan 2024
7.	Develop a c program to accept a string from the user. Display the count of upper case and lowercase characters in that string.	6	Jan 2024
8.	Write a C program to find average marks obtained by a class of 50 students in a test.	3	May 2024
9.	Write a C program to find the sum of two matrices	7	May 2024
10.	Write a C program to find the length of a given string without using built in string functions.	7	May 2024
	Module III		
1.	What is recursion? Write a C program to display Fibonacci series using recursive function	7	July 2021 June 2022
2.	What are the main differences between structures and unions? Which is preferred in what situation? Give examples.	7	June 2022 Jan 2024
3.	Define function prototype. Why is it used? Differentiate formal and actual parameters.	3	June 2023 May 2024
4.	Mention the difference between structure and union using suitable examples	3	June 2023 May 2024
5.	Explain different storage classes used in C by providing suitable examples.	8	June 2023 Jan 2024 May 2024
6.	What is meant by recursion? Write a program to find the factorial of a number using recursion.	6	June 2023 Jan 2024 May 2024
7.	Implement linear search using function. Reading the inputs and printing the result must be done in the main function.	10	June 2023
8.	Compare User defined functions with library functions.	4	June 2023
9.	Describe different methods of parameter passing in functions and implement a program.to swap two variables using those methods.	6	Jan 2024
10.	Write a C program to read and display data of n employees (Name, Employee Id and Salary) using structure.	7	May 2024
	Module IV		
1.	What do you mean by a pointer variable? How is it initialized?	3	June 2022 Jan 2024
2.	Write a C program to replace vowels in a text file with character ‘x’	7	June 2022
3.	Write a C program to print the elements of an array in reverse order using pointers	7	June 2022
4.	List out the various modes of opening a file in C language.	3	June 2023 Jan 2024 May 2024
5.	Write a program to read and store the details (the name, employee code (integer) and salary) of ‘n’ employees in a company into a file using structure. Print the details of the employee whose employee code is given	14	June 2023

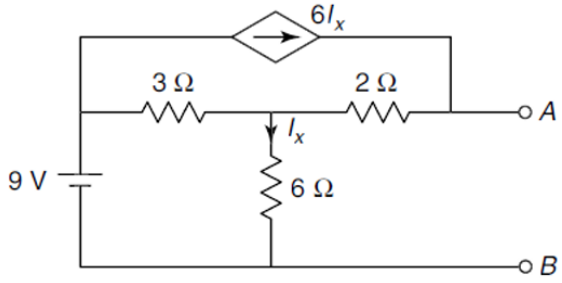
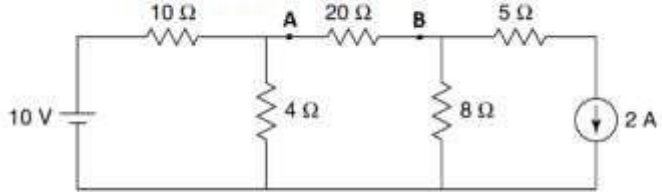
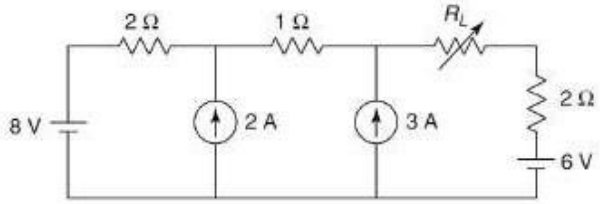
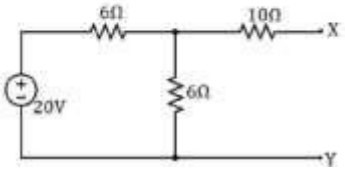
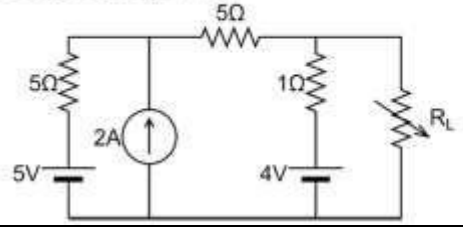
	as input		
6.	Write a program to copy the content of a file to another.	6	June 2023
7.	Explain any four file handling functions used in C.	7	May 2024
8.	Write a C program to swap two numbers using pointers.	7	May 2024
9.	Write a C program to read the data in a given file and display the file content on console.	7	May 2024
10.	Explain any three file Input and Output functions used in C.	7	May 2024

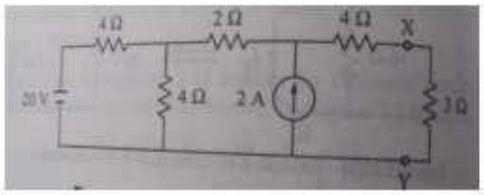
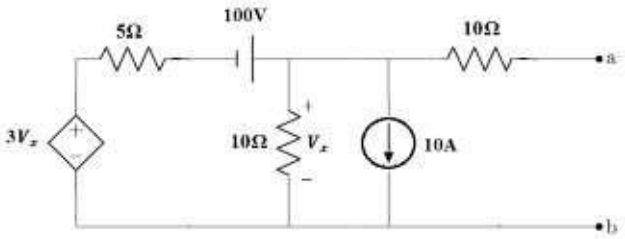
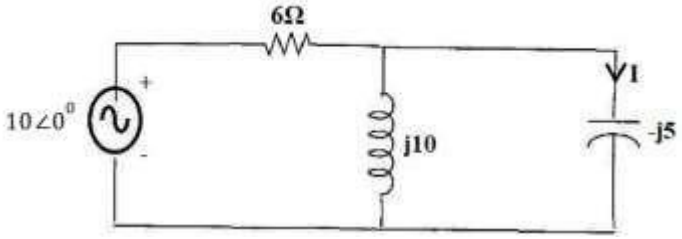
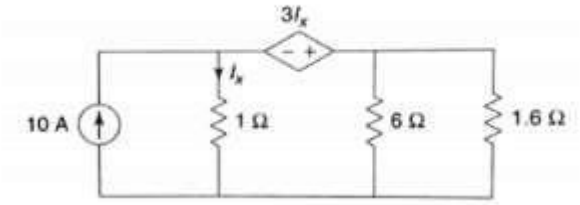
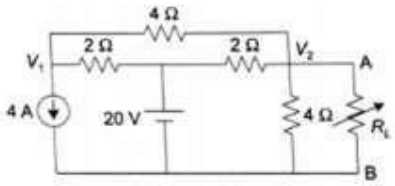
PCECT 205- NETWORK THEORY- Question Bank

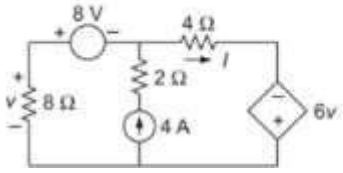
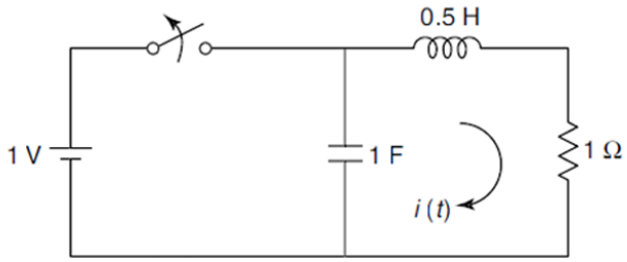
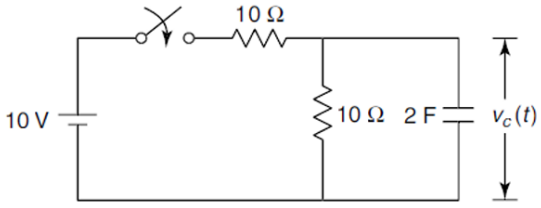
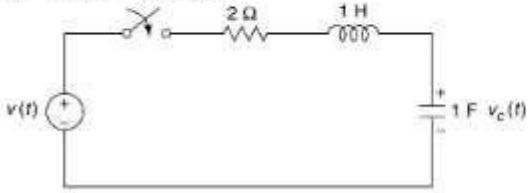
Sl No	MODULE 1	Marks	Year
1	Find the current through the 5 Ω resistor using nodal analysis 	7	Nov 2024
2	Find the voltage V in the network which makes the current in the 10 Ω resistor zero 	7	Nov 2024
3	Find voltage V_x using node analysis. 	8	Dec 2023
4	b. Find the node voltages of the following circuit. 	6	Dec 2023
5	b. Find the loop current I_1 and I_2 in the given network. 	6	Dec 2023

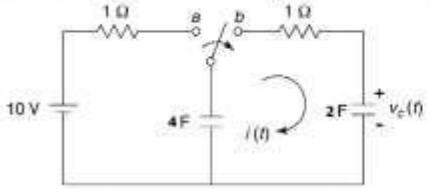
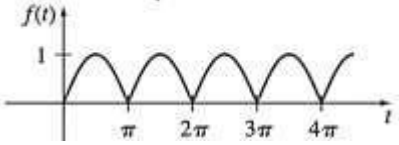
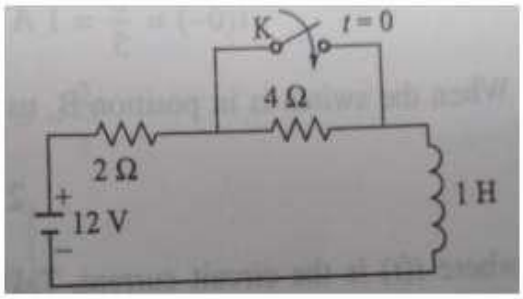
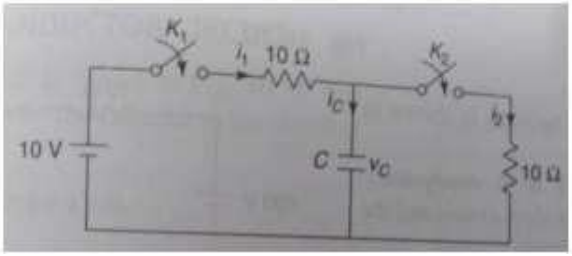
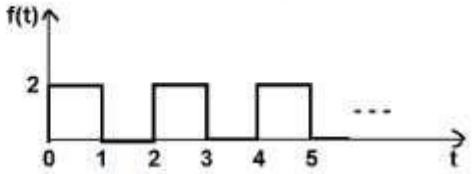
6	Find the current through 7V source using mesh analysis. 	6	Dec 2022
7	Find voltage V_1 using node analysis. 	8	Dec 2022
8	Find the current I_2 using mesh analysis. 	6	Dec 2022
9	Using nodal analysis ,find I in the circuit shown below 	7	Jan 2022
10	Evaluate the current through 25Ω resistor using node analysis 	8	Dec 2021

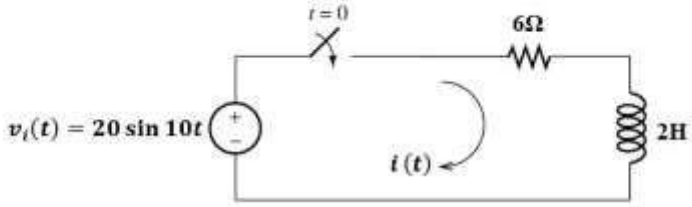
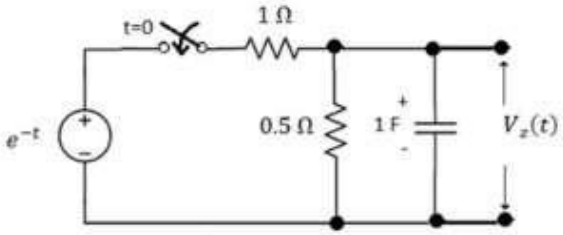
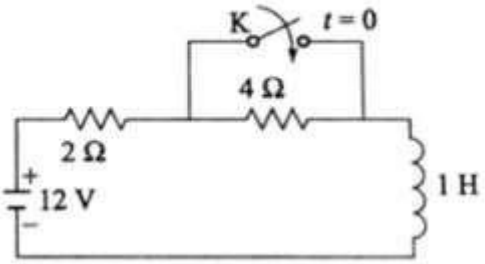
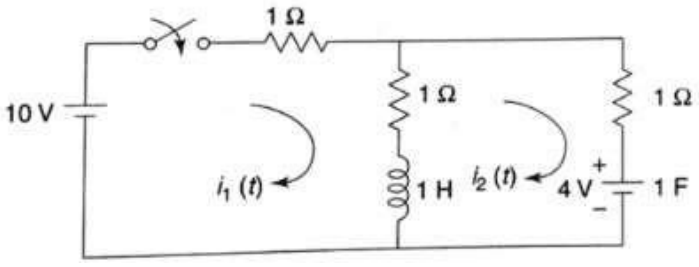
11	Evaluate the voltage across 10Ω resistor in the following network. 	14	Dec 2021
12	Explain super mesh analysis Differentiate ideal and practical voltage sources.	6	Dec 2021
13	Find voltage across 4Ω resistor using nodal analysis 	7	Dec 2020
	MODULE 2		
1	Find the current I in the network using superposition theorem 	7	Nov 2024
2	Find the value of resistance RL for maximum power transfer and calculate maximum power. 	7	Nov 2024

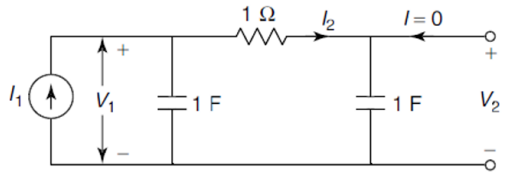
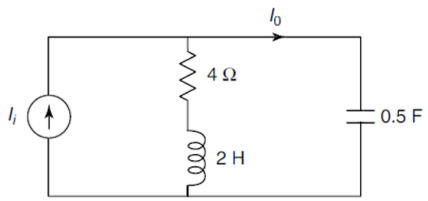
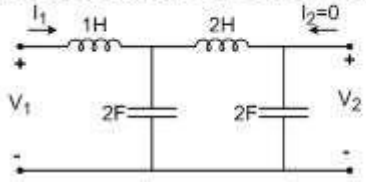
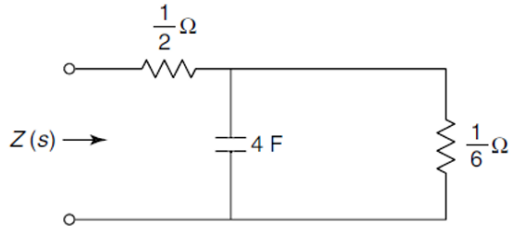
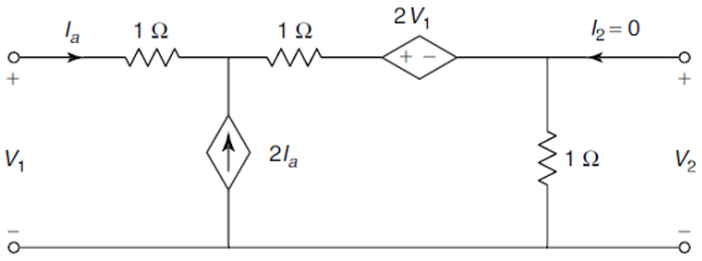
3	Find Norton's equivalent network at the terminals A and B 	7	Nov 2024
4	Obtain the Thevenin equivalent network for the given network of Fig. at terminals A and B. Find the current through the 20Ω resistor. 	**7**	Dec 2023
5	Find the value of R_L such that maximum power is transferred to it. Also find the maximum power transferred to R_L 	10	Dec 2023
6	Draw the Thevenin's equivalent for the circuit shown in figure with respect to the terminals X-Y and find the voltage across a 4Ω resistor connected across the terminals. 	**8**	Dec 2023
7	Find the value of load resistor, R_L for maximum power transfer and calculate maximum power. 	**7**	Dec 2022

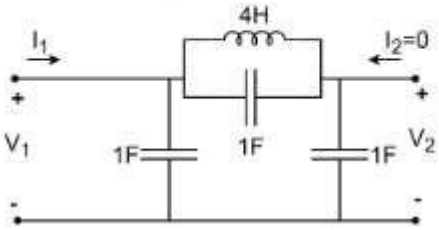
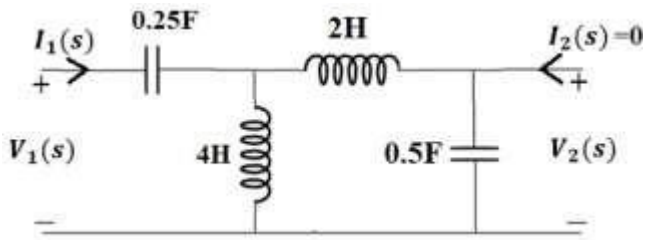
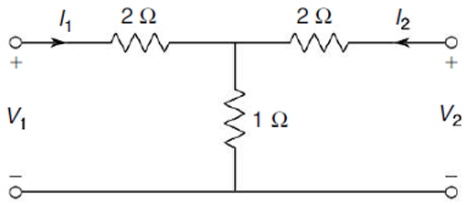
8	Determine the current through 3Ω for the circuit shown using Norton's theorem 	8	Jan 2022
9	Write the steps for finding the Norton equivalent circuit of a given network having only dependent sources with model equivalent circuit.	3	Dec 2021
10	Obtain the Thevenin equivalent circuit across the terminal a-b. 	8	Dec 2021
11	Evaluate I and verify Reciprocity theorem for the following network 	14	Dec 2021
12	State Reciprocity theorem What is the significance of Superposition theorem?	6	Dec 2020
13	Find current through 1.6Ω resistor using Thevenin's Theorem 	7	Dec 2020
14	Find value of R_L for maximum power transfer. Also find the maximum power transferred. 	7	Dec 2020

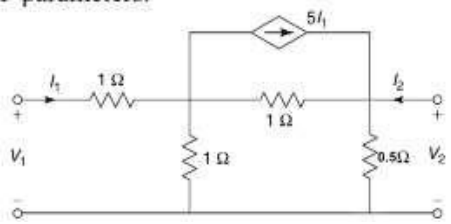
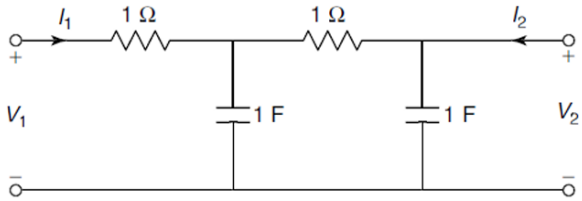
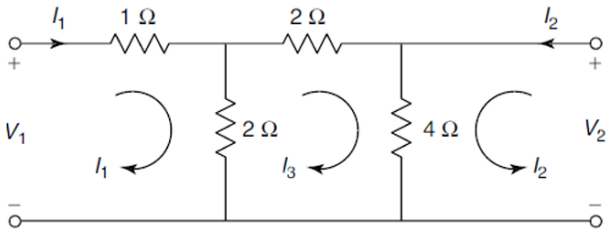
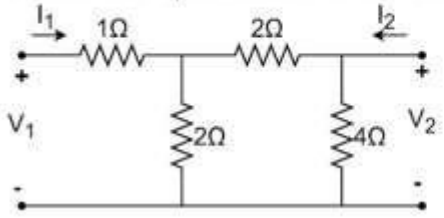
15.	Determine current through 4Ω resistor using superposition theorem. 	7	Dec 2020
	MODULE 3		
1	In the network the switch is opened at t = 0. Steady-state condition is achieved before t = 0. Find i(t)  Find the inverse Laplace transform of $\frac{(S+2)}{S^2(S+3)}$	14	Nov 2024
2	a) The switch in the network is closed at t = 0. Determine the voltage across the capacitor.  b) Verify the initial and final value theorems for $e^{-t}(t^2 + \cos 3t)$	**14**	Nov 2024
3	Find the voltage across the capacitor, $v_c(t)$ fot t > 0 in the network shown in Fig. (Assume zero initial conditions) for 1) $v(t) = 5u(t)$ 2) $v(t) = 6\delta(t)$ 	**8**	Dec 2023

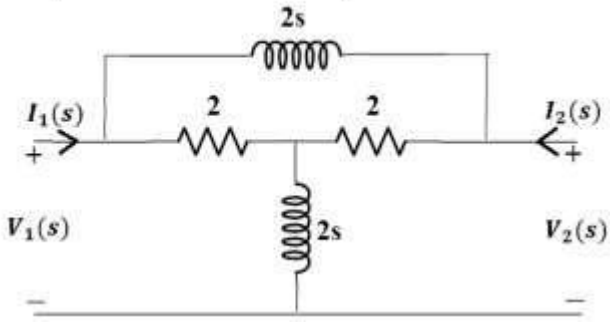
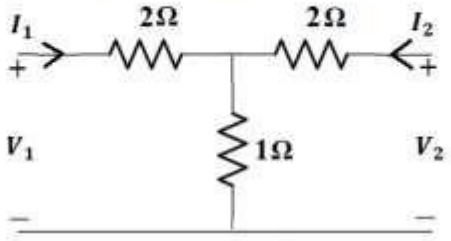
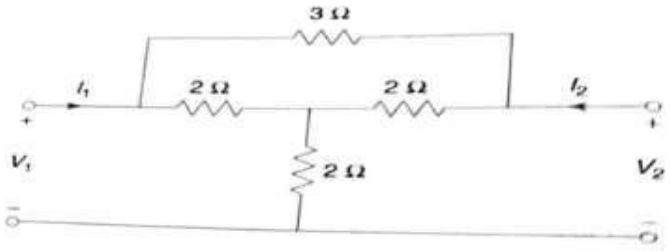
4	The switch is switched from the position 'a' to 'b' at t = 0 after steady state is achieved. Find the expression for the transient current i(t) for t>0. 	**8**	Dec 2023
5	Find the Laplace transform of the periodic function as shown in Fig. 	**6**	Dec 2022
6	A dc voltage is given to the circuit keeping the switch open so that steady state is reached. Determine the complete response for the circuit after closing the switch. 	7	Jan 2022
7	In the circuit shown,switch K1 has been closed for a long time prior to t=0.At t=0, the switch K2 is also closed. Find$v_c(o+)$ and $i_c(0+)$ 	8	Jan 2022
8	Obtain the Laplace Transform of the following signal. 	3	Dec 2021
9	Derive the time domain response of the RL circuit with step input.	3	Dec 2021

10	Evaluate $i(t)$ in the network for $v_i(t)=20\sin 10t$. Switch is closed at $t=0$. Assume that the initial value of current through the inductor is zero. 	14	Dec 2021
11	State initial value and final value theorem Find expression for current when an unit impulse is given to a series RC circuit.	6	Dec 2020
12	In the circuit, the switch is closed at $t = 0$, connecting a source e^{-t} to the RC circuit. At time $t = 0$, it is observed that capacitor voltage has the value $V_c(0) = 0.5V$. For the element values given, determine $V_2(t)$ after converting the circuit into transformed domain. 	8	Dec 2020
13	Determine current flowing through the circuit shown for $t \geq 0$ 	6	Dec 2020
13.	Find the expression for current through a series RL circuit when a pulse input of width T and amplitude A is applied across it For the circuit shown switch is closed at t = 0. Find currents $i_1(t)$ *and* $i_2(t)$ if initial current through inductor is zero and initial voltage on capacitor is 4V 	14	Dec 2020

	MODULE 4		
1	a) Determine the network functions $\frac{I2}{I1}$ and $\frac{V2}{I1}$ for the network  b) Plot pole-zero diagram of $\frac{I\,o}{Ii}$ for the network.  	8 6	Nov 2024
2	Determine the driving-point impedance, transfer impedance and voltage transfer ratio for the network shown in the figure.  	8	Dec 2022
3	a) Determine the poles and zeros of the impedance function Z (s)  b) Find the voltage transfer function $\frac{V2}{V1}$ for the network  	6 8	Nov 2024

4	Determine $\frac{V_2(s)}{V_1(s)}$ and $\frac{V_1(s)}{I_1(s)}$ for the network shown in Fig. 		Dec 2022
5	Show the pole zero plot for the given network function V(s) and obtain v(t) $V(s) = \frac{10s}{(s+3)(s+2)}$ Obtain the time domain response of the given function using pole zero diagram $V(s) = \frac{(s+2)(s+6)}{(s+1)(s+5)}$ Explain the significance of poles and zeros with reference to driving point functions and transfer functions.	7 14	Jan 2022 Dec 2020
6	Determine the driving point impedance in the input side of the following network. Also determine voltage gain transfer function. 	14	Dec 2021
7	Is $\alpha_{12} = \frac{2s^2+5s+1}{s+7}$ a valid function? Justify. What do you mean by open circuit natural frequency and short circuit natural frequency?	6	Dec 2020
8	a) Deduce ABCD parameters in terms of Z and h parameters b) Two identical network sections are connected in series. Obtain Z-parameters of the overall connection 	8 4	Dec 2024

9	Draw equivalent circuit of two port network as shown in the figure in terms of Y parameters. 	6	Dec 2023
10	a) Obtain the admittance parameters for the network  b) Determine h parameters for the network. Determine whether the network is reciprocal. 	8 6	Nov 2024
11	Two identical sections of the network shown in Fig. are connected in series. Obtain the Z-parameters of the combination. 	6	Dec 2022
12	Currents entering port1 and port2 of a two port network are given by the following equations $I_1 = 0.5V_1 - 0.2\,V_2$ $I_2 = -0.2V_1 + V_2$ Find Z and ABCD parameters	10	Jan 2022

13	Determine the Y-parameters of the following network 	14	Dec 2021
14	Two identical sections of the following network are connected in series-parallel combination. Determine the hybrid parameters 	14	Dec 2021
15	Show that when two 2 port networks are connected in parallel, the resultant Y matrix is the sum of Y matrices of each individual network. Obtain short circuit admittance parameters of the circuit shown. 	14	Dec 2020

UCEST206

ENGINEERING ENTREPRENEURSHIP AND IPR

Module 1:

Sl. No	Question	Year Month	Marks
1	Define ideation and its importance in entrepreneurship	SQ	3
2	What are the different types of Intellectual Property Rights (IPR)?	SQ	3
3	List the key statutory compliances required to start a business.	SQ	3
4	Explain the role of IPR in securing funding and gaining a competitive advantage for startups.	SQ	9
5	Discuss the frameworks for innovation and their relevance to entrepreneurship.	SQ	9
6	Analyze the importance of building a strong team and explain the strategies to identify roles and skill sets.	SQ	9

Module 2:

Sl. No	Question	Year Month	Marks
1	What is market segmentation, and why is it crucial for entrepreneurs?	SQ	3
2	Briefly describe the purpose of a customer profiling process.	SQ	3
3	Outline the steps involved in conducting a SWOT analysis of competitors.	SQ	3
4	Discuss the components of a value proposition and explain its significance in market validation.	SQ	9
5	Discuss the components of a value proposition and explain its significance in market validation.	SQ	9
6	Explain the regulatory and legal considerations in the preparation of a problem and solution canvas.	SQ	9

Module 3:

Sl. No	Question	Year Month	Marks
1	Define a business plan and mention its primary components.	SQ	3
2	What is the significance of financial projections in a business plan?	SQ	3
3	Highlight the role of risk management in business planning.	SQ	3
4	Prepare a detailed business plan framework for a tech-based startup, including market analysis and operations.	SQ	9
5	Describe the iterative development and feedback loop process in prototype development.	SQ	9
6	Discuss the importance of testing and quality assurance in prototype development and its impact on product success.	SQ	9

Module 4:

Sl. No	Question	Year Month	Marks
1	What are the key elements to consider in stakeholder engagement strategies?	SQ	3
2	List the benefits of engaging advisors and mentors in a startup.	SQ	3
3	Define resource allocation in the context of prototype development.	SQ	3
4	Explain the strategies for engaging investors and partners during the prototype development phase.	SQ	9
5	Discuss the technical specifications and development timeline required for successful prototype creation.	SQ	9
6	Illustrate the role of documentation and version control in managing prototype development effectively.	SQ	9