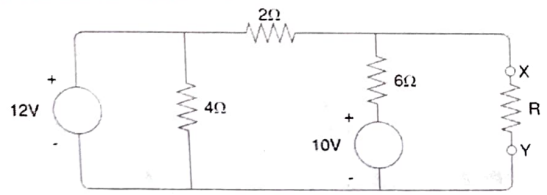
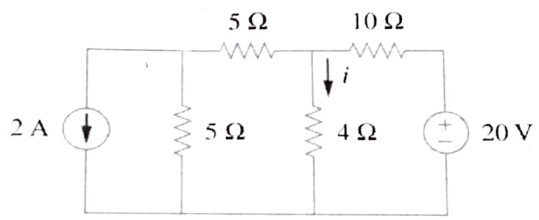
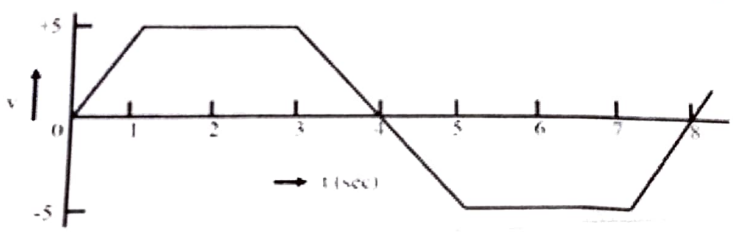
Sub Code: **BEE-101**

Roll No. 2 0 2 2 0 4 1 0 0 7

B. Tech.
Year: I /Sem: I
Test-I (Examination): 2022-23
Subject: Fundamentals of Electrical Engineering

Time: 1 Hr. Max Marks: 10

Note: Attempt ALL questions. Each question carries equal marks

Q1.		Attempt any Two parts of the following. **Q. 1 (a) is compulsory.**	Marks	CO	BL	PO	PI Code
	a)	1) Define maximum power transfer theorem. Also prove expression for maximum power transfer theorem. 2) Find the value of maximum power transferred to the R connected across terminal X-Y. 	3				
	b)	Define the following terms with examples:- 1) Active and passive elements. 2) Unilateral and bilateral elements. 3) Linear and non-linear elements.	2				
	c)	Calculate the value of current i using superposition theorem. 	2				
Q2.		Attempt any Two parts of the following. **Q. 1 (a) is compulsory.**					
	a)	Find the RMS and average value of given waveform. Also find Peak factor. 	3				
	b)	In an AC series R-L-C circuit, resistance of 50 Ω, inductance of 0.3 H and capacitance of 15 μF is connected to an AC voltage source 25 V, 50 Hz. Determine the current in the circuit.	2				
	c)	What is resonance in AC circuit? A series RLC circuit has R= 1KΩ, C=40μF and L=13mH. Determine resonant frequency (rad/sec) and quality factor.	2				

BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analyzing, 5 –

ON) 2022 – 2023

Time: 1 Hrs. **Engineering Physics**

***Note:* Attempt ALL questions.** **Max Marks: 10**

			Marks	CO	BL	PO	PI Code
Q1.		**Attempt any two parts of the following. Q.1 (a) is compulsory.** **Unit-I**					
	a)	Define crystal lattice. Differentiate between crystal and amorphous solid.	3	1	1	1	
	b)	Briefly discuss the crystallography. How Bragg's law is useful to find out structure of crystal.	2	1	1	1	
	c)	What do you mean by atomic packing factor (APF). Write formula and calculate APF for SC and BCC lattice.	2	1	1	1	
Q2.		**Attempt any two parts of the following. Q.2 (a) is compulsory.** **Unit-II**					
	a)	Discuss Davisson-Germer experiment. How it is useful to identify the wave characteristic of particle?	3	2	1	1	
	b)	A proton is moving with a speed of 2×10^8 m/s. Find the wavelength of the matter-wave associated with it. (Given that, mass of proton, $m_0 = 1.67 \times 10^{-27}$ kg)	2	2	1	1	
	c)	Highlights the postulates of quantum mechanics.	2	2	1	1	

BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)

CO – Course Outcomes

PO – Program Outcomes

PI Code – Performance Indicator Code

BSM-101

Roll No. 2 0 2 2 0 4 1 0 0 7

B. Tech.
Year: First Semester: I
Minor Test Exam - I
Calculus and Linear Algebra

Time: 1 Hrs. **Max Marks: 15**

Note: Attempt ALL questions.

			Marks	CO	BL	PO	PI Code
Q1.		Attempt any **Two parts** of the following. **Q 1(a) is compulsory.**					
	a)	i. Verify Lagrange mean value theorem for the function $f(x) = \tan^{-1}(x)$ in the interval $[0,1]$. ii. If $y = \tan^{-1} x$, find $y_n(0)$.	5	2	3	1,2,8	1.2.1 1.2.2 8.3.1
	b)	i. If $u = \sin^{-1}\left[\frac{x^{1/4}+y^{1/4}}{x^{1/6}+y^{1/6}}\right]$, then find $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2}$. ii. The Temperature T at any point (x, y, z) in space is $T(x, y, z) = kxyz^2$, k is positive constant. Find the highest temperature on the surface of sphere $x^2 + y^2 + z^2 = 1$.	3	1,2	3	1,2,8	1.2.1 1.2.2 8.3.1
	c)	If u, v, w are the roots of the cubic equation $(\lambda - x)^3 + (\lambda - y)^3 + (\lambda - z)^3 = 0$ in λ, then find $\frac{\partial(u,\ v,\ w)}{\partial(x,\ y,\ z)}$.	3	2	3	1,2,8	1.2.1 1.2.2 8.3.1
Q2.		Attempt any **Two parts** of the following. **Q 2(a) is compulsory**					
	a)	i. Show that every square matrix can be uniquely written as a sum of Hermitian and skew Hermitian matrix. ii. Determine the value of k such that following system of linear equations $kx + y + z = 1,\ x + ky + z = 1, x + y + kz = 1$ has (i) unique solution (ii) no solution (iii) infinite solutions.	4	3	3	1,2,8	1.2.1 1.2.2 8.3.1
	b)	Find the eigen values and eigen vector of the matrix $A = \begin{bmatrix} 3 & 1 & -1 \\ 2 & 2 & -1 \\ 2 & 2 & 0 \end{bmatrix}$.	3	3	3	1,2,8	1.2.1 1.2.2 8.3.1
	c)	i. Find the rank of the matrix $\begin{bmatrix} 2 & 3 & -2 & 4 \\ 3 & -2 & 1 & 2 \\ 3 & 2 & 3 & 4 \\ -2 & 4 & 0 & 5 \end{bmatrix}$. ii. State the Cayley-Hamilton theorem. Verify this theorem for the matrix $A = \begin{bmatrix} 1 & 2 \\ -1 & 3 \end{bmatrix}$. Hence express $A^6 - 4A^5 + 8A^4 - 12A^3 + 14A^2$ as linear polynomial in A.	3	3	3	1,2,8	1.2.1 1.2.2 8.3.1

BSM-142

Roll No. 2 0 2 2 0 4 1 0 0 7

Bachelor of Technology
Branch: ECE Year: I. Sem: I
Test-I 2022.-23

Advanced Environmental Chemistry

Time: **1 Hr.** Max Marks: **10**

Note: Attempt **ALL** questions. ALL questions carry equal marks.

			Marks	CO	BL	PO	PI Code
Q1.		***Attempt any Two parts of the following. Q. 1 (a) is compulsory.***					
	a)	What are the major regions of the atmosphere? Give their respective altitudes and temperature ranges. What are the important chemical species in these regions? Give your answer with a table and figure only.	3	1, 2	2	7, 1	7.1.2
	b)	What is Greenhouse Effect? Describe its impact on global climate and food production.	2	1, 2	2	7, 1	1.2.1
	c)	What is Nitrogen fixation? Explain the functioning of nitrogen cycle with a sketch.	2	1, 2	2	7, 1	1.2.1
Q2.		***Attempt any Two parts of the following. Q. 2 (a) is compulsory.***					
	a)	Give an account of indoor air pollution and its adverse effects on human health.	3	4	1	7, 1	7.2.1
	b)	How will you control sulphur dioxide emissions from thermal power plants?	2	4	3	7, 1	7.2.2
	c)	List the major air pollutants and explain their effects on human beings.	2	4	2	7, 1	7.2.1

BHM-101

ROLL NUMBER | 2 | 0 | 2 | 2 | 0 | 4 | 1 | 0 | 0 | 7 |

B. Tech.

MINOR TEST (EXAMINATION) 2022-23

PROFESSIONAL COMMUNICATION

TIME: 1 Hour **Max. Marks: 20**

Note: Attempt all questions.

Q. 1 Attempt any two parts of the following. Q 1(a) is compulsory.

a) Explain 3 verbal and 3 non-verbal communications. (6)

b) What do you understand by Active and Passive vocabulary? (4)

c) What is Group Discussion? How it is different from Debate. (4)

Q. 2 Attempt any two parts of the following. Q 2(a) is compulsory.

a) Explain skimming, scanning and the role of inferential comprehension? (6)

b) What do you understand by the interpretation of graphics and visuals in technical writing? (4)

c) Write a short note on any two of the following: (4)

- Predicting
- Guessing meaning
- Elocution