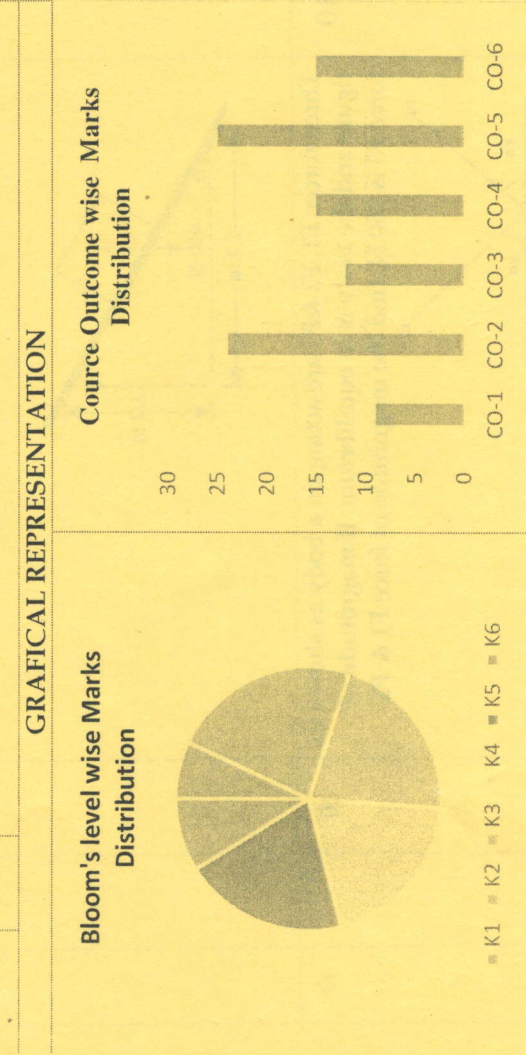
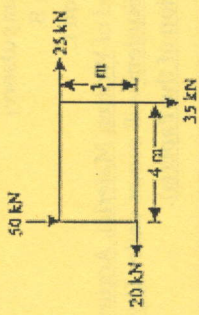
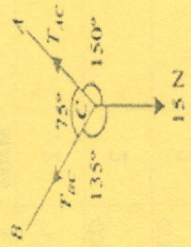
		END SEM EXAMINATION School of Engineering & IT	
Branch	Mechanical Engineering	Program	Diploma	Semester	II
Subject Name	Engineering Mechanics	Year	June 2024		
Time: 3 Hour Max. Marks : 70	• Start writing from 2nd page onwards; don't Write on the 1st Page Backside • Answer all Questions of Section A (Compulsory) • Answer Any Four out of Six of Section B • Answer Any Three out of Five of Section C • Possession of <u>Mobile Phone</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussion with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Paper(s)</u> .				
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating		
	K2 : Understanding	K4 : Analysing	K6 : Creating		

Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)					
Q. N1	QUESTIONS	Marks	COs	KL	
i	Explain types of Beam.	2	CO1	K1	
ii	Write its SI and CGS unit of Force.	2	CO1	K1	
iii	What is an ideal machine?	2	CO1	K1	
iv	Define Lifting machine?	2	CO1	K1	
v	What is Efficiency of a machine?	2	CO1	K1	
vi	What are the different types of Equilibrium Condition?	2	CO1	K1	
vii	Highlight the disadvantages of Friction.	2	CO1	K1	
viii	Define angle of friction.	2	CO1	K1	
ix	What is a vector quantity?	2	CO1	K1	
x	Define Free Body Diagram.	2	CO1	K1	

CO- Course Outcomes,	KL- Knowledge Level,	PO - Program Outcome
CO1	identify the force systems for given conditions by applying the basics of mechanics.	
CO2	Determine unknown force(s) of different engineering systems.	
CO3	Apply the principles of friction in various conditions for useful purposes	
CO4	Find the centroid and centre of gravity of various components in engineering systems	
CO5	Select the relevant simple lifting machine(s) for given purposes	
CO6		

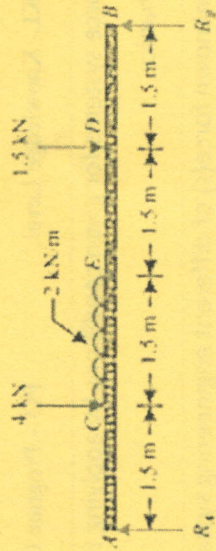
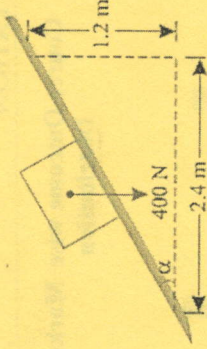
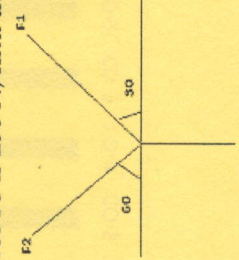


**Section B (Answer any FOUR out of SIX) – 20 Marks**  
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	<p>A system of forces are acting at the corners of a rectangular block as shown in Fig. Determine the magnitude and direction of the resultant force.</p> 	05	CO2	K1
3	<p>Define and Explain Warm and Warm Wheel.</p>	05	CO3	K2
4	<p>State Lami's Theorem. Find the tension along BC and AC.</p> 	05	CO3	K3
5	<p>Differentiate between beam and column. Explain different types of beam. Find the magnitude of the two forces, such that if they act at right angles, their resultant is <math>\sqrt{10}</math> N. But if they Act at <math>60^\circ</math>, their resultant is <math>\sqrt{13}</math> N</p>	05	CO4	K1
6	<p>Differentiate between beam and column. Explain different types of beam</p>	05	CO5	K2
7	<p>Differentiate between beam and column. Explain different types of beam</p>	05	CO1	K3

**Section C (Answer any THREE out of FIVE) – 30 Marks-**  
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	<p>A simply supported beam, AB of span 6 m is loaded as shown in Fig. Determine the reactions RA and RB of the beam</p>	10	CO2	K1

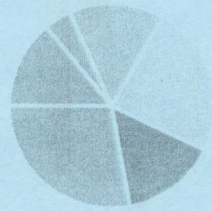
9	 <p>An inclined plane as shown in Fig. is used to unload slowly a body weighing 400 N from a truck 1.2 m high into the ground. The coefficient of friction between the underside of the body and the plank is 0.30. State whether it is necessary to push the body down the plane or hold it back from sliding down. What minimum force is required parallel to the plane for this purpose?</p> 	10	CO3	K2
10	<p>Three forces F1, F2 &amp; F3 are acting on a body as shown in figure and the body is in equilibrium. If magnitude of force F3 is 250 N, find the magnitude of force F1 &amp; F2.</p> 	10	CO3	K1
11	<p>Describe the analytical method for finding support reactions of a simply supported beam. Explain briefly</p>	10	CO4	K3
12	<p>A) Which Type of Friction Occurs When a Body Slides Over a Surface? ... B) Which Type of Friction Is Greater, Static or Kinetic Friction?</p>	10	CO5	K1

CO- Course Outcomes, **KL-** Knowledge Level, **PO** – Program Outcome

CO1	Description of the Environment and physical features of the environment
CO2	Flow of energy ,Mixture of solid particles and gases in the air in imbalanced ratio
CO3	Earth climatic zones, Primary and secondary air pollutants, Effects of this in living and non-living things. Parameters of water quality Land degradation is caused by the presence of xenobiotic or other
CO4	It is a process used to remove contaminants from Waste water or sewage.
CO5	Effort towards strategies and activities that help Reducing pollution. Specification for industries.

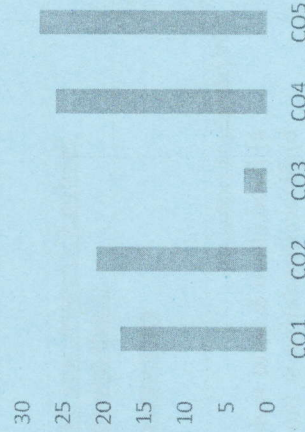
**GRAFICAL REPRESENTATION**

**Bloom's Level wise Marks Distribution**



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

**Course Outcome Wise Marks Distribution**



**ARKA JAIN University**  
Jharkhand



**END SEM EXAMINATION**  
School of Engineering & IT

Branch	Mechanical Engineering	Program	Diploma
Subject Name	Environmental Science	Semester	II
		Year	2024
Time: 1.5 Hour Max. Marks : 35	<ul style="list-style-type: none"> <li>Start writing from 2nd page onwards; don't Write on the 1st Page Backside</li> <li>Answer all Questions of Section A (Compulsory)</li> <li>Answer Any Four out of Six of Section B</li> <li>Answer Any Three out of Five of Section C</li> <li>Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Papers.</u></li> </ul>		
Knowledge Level (KL)	K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing	K5 : Evaluating K6 : Creating

**Section A (Each question Carry 01 Mark from Q1-i to -x) – 10 Marks**

Q. N 1	QUESTIONS	Marks	COs	KL
i	Which of the following is the cause of soil pollution? a.Ozone b.Aerosol c.Acid rain d.None of the above	1	CO1	KL K1
ii	Which of the following is a renewable source of energy? a.Coal b.Uranium c.Wind d. None of the above	1	CO2	K2
iii	Which of the following is said to be a biodegradable waste? a.Plastics b.Glasses c.Eggshell d.Polythene	1	CO3	K3
iv	Sugar is a form of - a.Carbohydrate b.Fat	1	CO2	K2

**Section B (Answer any FIVE out of SIX) – 10 Marks**  
(Each question 2 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Mention biotic components of an ecosystem	2	CO1	K1
3	Differentiate between food chain and food web	2	CO1	K2
4	Define the ecosystem with examples	2	CO2	K2
5	What do you mean by noise pollution	2	CO3	K3
6	Explain the causes and effects of soil degradation	2	CO4	K4
7	Explain the causes and effects of global warming	2	CO3	K3

**Section C (Answer any THREE out of FIVE) – 15 Marks-**  
(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Write short notes on a) Food chain & food web b) Bioaccumulation & Bio magnification c) Ecological succession	5	CO2	K2
9	What are Natural resources? Explain the renewable & non-renewable energy sources	5	CO3	K3
10	Explain the environmental effects of water pollutants	5	CO3	K3
11	What are various types of hazardous wastes and explain how to manage these wastes.	5	CO4	K5
12	Explain solid waste management and handling rules	5	CO5	K5

v	c. Protein d. Water Paper is made up of - a. Polythene and cotton b. Starch and cellulose c. Grass and Bamboo d. None of the above	1	CO4	K4
vi	Which of the following are the types of pollution that affect the environment? a. Air pollution b. Water pollution c. Land pollution d. All of the mentioned	1	CO3	K3
vii	Which of the following is a renewable source of energy? a. Ocean currents b. Solar energy c. Biomass d. All of the above	1	CO2	K2
viii	Why carbon dioxide is called a greenhouse gas? a. Because they absorb heat b. Because they absorb moisture c. Because they absorb oxygen d. Because they absorb hydrogen	1	CO3	K3
ix	Which of these elements is present in the drinking water that can lead to numerous fatal diseases? a. Phosphorus b. Calcium c. Arsenic d. None of the above	1	CO5	K5
x	Which of these does not constitute to be a reason for the loss of forests? a. Extinction of species b. Increasing use of wood c. Building dams and mining d. Extensive usage of fuel woods	1	CO5	K5



**ARKA JAIN University**  
Jharkhand

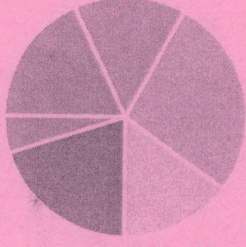


**END SEM EXAMINATION**  
School of Engineering & IT

<b>Branch</b>	Mechanical Engineering	<b>Program</b>	Diploma
<b>Subject Name</b>	Fundamentals of Electrical and Electronics Engineering	<b>Semester</b>	II
		<b>Year</b>	2024
<b>Time: 3 Hour</b> <b>Max. Marks: 70</b>	<ul style="list-style-type: none"> <li>Start writing from 2nd page onwards; don't Write on the 1st Page Backside</li> <li>Answer all Questions of Section A (Compulsory)</li> <li>Answer Any Four out of Six of Section B</li> <li>Answer Any Three out of Five of Section C</li> <li>Possession of <u>Mobile Phone</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussion with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Paper(s)</u>.</li> </ul>		
<b>Knowledge Level (KL)</b>	K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing	K5 : Evaluating K6 : Creating

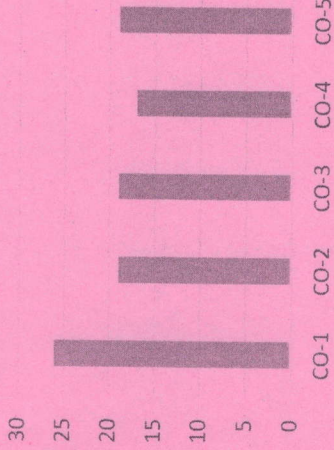
<b>CO1</b>	Remembering the basic terminology/ definitions of electrical component & Signals.
<b>CO2</b>	Understanding the Analog electronic Specially Op-Amp & Digital Electronics and their applications.
<b>CO3</b>	Applying the knowledge of theorems/laws for Predict the behavior of any electrical and magnetic circuits and use the principles of electromagnetic induction in electrical applications.
<b>CO4</b>	Analyzing the formulation and solution of simple and complex AC, Dc circuits
<b>CO5</b>	Evaluating the requirement of transformers and the type of electrical machine used for that particular application.

**Bloom's level wise Marks Distribution**



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

**Course Outcome wise Marks Distribution**

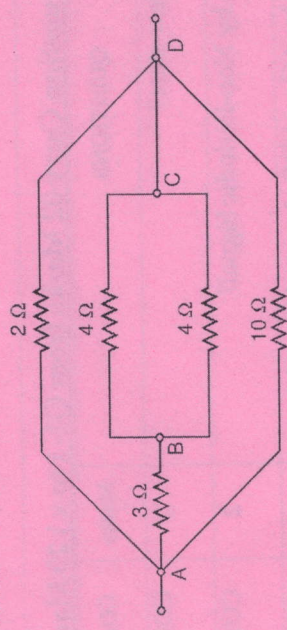


**Section A (Each question Carry 02 Marks from Q1- i to x) 20 Marks**

Q. N	QUESTIONS	Marks	COs	KL
1				
i	What does Ohm's law state?	2	CO1	K1
ii	What do you mean by Non-Periodic Signal?	2	CO1	K2
iii	What do you mean by AC and DC electrical Signals?	2	CO2	K1
iv	Why are logic gates called universal gates?	2	CO2	K2
v	What is electric energy?	2	CO3	K1
vi	What is meant by Lenz's Law?	2	CO3	K2
vii	Define the term "Flemings right hand rule".	2	CO4	K2
viii	What does KCL and KVL stands for?	2	CO1	K3
ix	What is a Transformer?	2	CO5	K1
x	What type of losses occurs in a transformer?	2	CO5	K2

12	The number of turns in the secondary coil of a 22 kVA, 2200V/220V single-phase transformer is 50. Find (i) number of primary turns (ii) primary full load current (iii) secondary full load current. Neglect all kinds of losses in the transformer.	10	CO5	K5
----	--	----	-----	----

Section B (Answer any FOUR out of SIX) – 20 Marks (Each question Carry 05 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
2	Write down the difference between active and passive components.	05	CO1	K4
3	Develop the circuit and truth table for a NAND gate.	05	CO2	K6
4	Describe briefly about the hysteresis loop.	05	CO3	K3
5	Explain AC circuit with pure inductor.	05	CO4	K2
6	Derive the expression for emf equation of a transformer and explain the transformation ratio of a transformer.	05	CO5	K5
7	Determine the equivalent resistances of the circuit shown:	05	CO1	K5



Section C (Answer any THREE out of FIVE) – 30 Marks (Each question Carry 10 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
8	Write down the short notes on the followings, including their symbol and S.I. units: Capacitor Ideal and Practical Voltage Source Resistivity	10	CO1	K1
9	Explain briefly about operational amplifiers (op-amps), their symbol, types, and applications.	10	CO2	K3
10	Write down the analogy between electric and magnetic circuits.	10	CO3	K4
11	Describe briefly about the following terms related to AC circuits: (1) Form factor (2) Frequency (3) Power factor (4) Maximum value.	10	CO4	K3



**ARKA JAIN**  
**University**  
Jharkhand



**END SEM EXAMINATION**  
**School of Engineering & IT**

Branch	Mechanical Engineering	Program	Diploma
Subject Name	Introduction to IT systems	Semester	II
		Year	June 2024
Time: 3 Hour Max. Marks : 70	<ul style="list-style-type: none"> <li>Start writing from 2nd page onwards; <b>don't Write on the 1st Page Backside</b></li> <li>Answer all Questions of Section A (Compulsory)</li> <li>Answer Any Four out of Six of Section B</li> <li>Answer Any Three out of Five of Section C</li> <li>Possession of <u>Mobile Phone</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussion with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Paper(s)</u>.</li> </ul>		
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)			
Q.N1	QUESTIONS	Marks	COs
i	What do you mean by the term software? Give an example.	2	co1
ii	What is Random Access Memory?	2	co2
iii	What are the different types of ROM? *	2	co2
iv	Divide the following into input and output devices: a. Microphone b. Earphone c. Keyboard d. Monitor.	2	co3
v	What is recycle bin?	2	co1
vi	What is internet?	2	co1
vii	Differentiate between CSS and HTML.	2	co1
viii	Define data and information?	2	co4
ix	What is IP address?	2	co5
x	In 2023, hackers attacked AIIMS Delhi, causing server shutdowns attacks in India that shook up the entire healthcare industry. What kind of attack was it?	2	co5

CO5	Protect information and computers from basic abuses/attacks.
<b>GRAPHICAL REPRESENTATION</b>	
<p>Bloom's level wise Marks Distribution</p> <p>■ KL.1 ■ KL.2 ■ KL.3 ■ KL.4 ■ KL.5 ■ KL.6</p>	<p>Course Outcome wise Marks Distribution</p>

**Section B (Answer any FOUR out of SIX) – 20 Marks**  
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Define a computer and write about its functional parts.	05	co2	kl4
3	What are the different generations of computer? Write short note on each of the generations.	05	co1	KL4
4	Write a detailed note on operating system.	05	co1	KL1
5	What is the difference between Power point and Word?	05	co4	KL2
6	Write down the steps to create a folder called "POLYME" and create a text file inside it stating, "Life is awesome" using DOS commands.	05	co3	KL6
7	Can you write in detail about the different peripheral devices?	05	co2	KL1


**Section C (Answer any THREE out of FIVE) – 30 Marks-**  
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Explain in detail the different advantages and disadvantages of computer.	10	co1	kl2
9	What is hacking? State its types.	10	co5	KL2
10	What is HTML and CSS? Explain with suitable example.	10	co3	KL3
11	Write about different office tools that you use day-to-day.	10	co4	KL3
12	What is Shell Script? Write it's Advantages and Disadvantage?	10	co3	KL2

**CO- Course Outcomes, KL- Knowledge Level, PO – Program Outcome**

CO1	Comfortably work on computer, install and configure OS.
CO2	Assemble a PC.
CO3	Connect it to external devices, write documents.
CO4	Create worksheets, prepare presentations.
Course Outcomes	



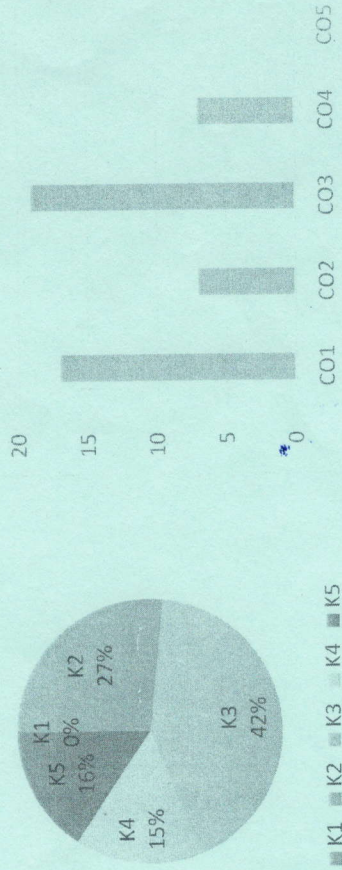
	<b>ARKA JAIN University</b> Jharkhand		<b>NAAC</b> GRADE <b>A</b> ACCREDITED UNIVERSITY		<b>END SEM EXAMINATION</b> School of Engineering & IT	
	Branch	CSE ME EEE	Program		Diploma	
Subject Name	Mathematics-II	Semester		II		
		Year		June 2024		
Time: 3 Hour Max. Marks : 70	<ul style="list-style-type: none"> <li>Start writing from 2nd page onwards; <b>don't</b> Write on the 1st Page Backside</li> <li>Answer all Questions of Section A (Compulsory)</li> <li>Answer Any Four out of Six of Section B</li> <li>Answer Any Three out of Five of Section C</li> <li>Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments</u> with the <u>Invigilator</u> or <u>Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers</u>.</li> </ul>					
Knowledge Level (KL)	K1 : Remembering		K3 : Applying		K5 : Evaluating	
	K2 : Understanding		K4 : Analysing		K6 : Creating	

Section A (Each question Carry 02 Marks from Q1-i to Q1-x) – 20 Marks							
Q. N1	QUESTIONS				Marks	COs	KL
i	What is the result of the multiplication $5 \times \begin{bmatrix} 5 & 0 \\ 2 & -3 \end{bmatrix}$ .				2	CO1	K1
ii	Evaluate $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3}$ .				2	CO1	K3
iii	Differentiate $\sin(5x+7)$ .				2	CO3	K2
iv	Evaluate $\int \sin 2x \, dx$ .				2	CO2	K3
v	Evaluate $\lim_{x \rightarrow 0} \frac{\sin 3x}{5x}$				2	CO3	K5
vi	Evaluate $\int_0^{\frac{\pi}{2}} \sin^2 x \, dx$ .				2	CO4	K4
vii	Find the order and degree of $\frac{dy}{dx} = \sqrt{\frac{d^3 y}{dx^3}}$ .				2	CO1	K3
viii	Evaluate $\int_0^2 x^2 \, dx$				2	CO3	K2
ix	Find the value of $\begin{vmatrix} a+ib & c+id \\ -c+id & a-ib \end{vmatrix}$ .				2	CO2	K3
x	Check the function $f(x) = x^3$ is an even function or odd function.				2	CO3	K5

Course Outcomes	CO1	How to describe several areas of mathematics beyond calculus
	CO2	How to Solve differential equations using appropriate methods.
	CO3	Concepts of differentiation in physics & engineering courses
	CO4	Express their interest in mathematics
	CO5	How to evaluate mathematical solutions in a concise and informative manner

**GRAFICAL REPRESENTATION**

**BLOOM'S LEVELS WISE MARKS DISTRIBUTION** course outcome wise marks distribution



**Section B (Answer any FOUR out of SIX) - 20 Marks**

(Each question carry 5 Marks)

No.	QUESTIONS	Marks	COs	KL
2	Evaluate $\lim_{x \rightarrow 0} \frac{\sqrt{1+x} - \sqrt{1-x}}{x}$ .	5	CO1	K3
3	If $A = \begin{bmatrix} 4 & x+2 \\ 2x-3 & x+1 \end{bmatrix}$ is symmetric matrix, find x.	5	CO3	K2
4	Find the integral $\int x^2 e^x dx$ .	5	CO1	K3
5	Find the differential equation of $y = a e^x + e^{-x}$ , where a and b are arbitrary constant.	5	CO3	K5
6	Find the rate of change of the area of a circle per second with respect to its radius r; when $r = 5$ cm.	5	CO4	K4
7	Find the slope of tangent and normal to the curve $x^2 + y^2 = 25$ at point $(-3, 4)$ .	5	CO2	K3

**Section C (Answer any THREE out of FIVE) - 30 Marks-**

(Each question Carry 10 Marks)

No.	QUESTIONS	Marks	COs	KL
8	A function is defined as $f(x) = x^2 - 3x$ a) Find the value of $f(2)$ b) Find the value of x for which $f(x) = 4$	10	CO1	K3
9	Find the derivatives of $\cos x$ by FIRST PRINCIPLE	10	CO3	K5
10	Solve the system of linear equation using matrix method $x + 3y = 5$ $x + y = 6$	10	CO4	K4
11	Find the inverse of the matrix $A = \begin{bmatrix} 2 & 1 \\ 7 & 4 \end{bmatrix}$	10	CO2	K3
12	Show that the matrix $A = \begin{bmatrix} 5 & 3 \\ 2 & 1 \end{bmatrix}$ ; satisfy its own characteristic equation.	10	CO3	K2