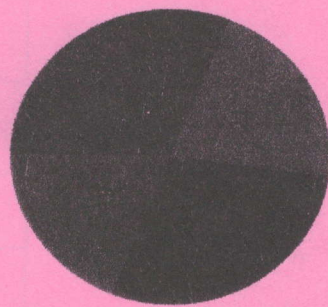


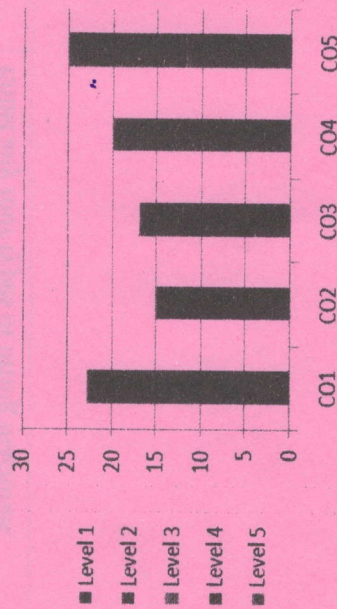
Course Outcomes	CO1	Identify the force systems for given conditions by applying the basics of mechanics.
	CO2	Determine unknown force(s) of different engineering systems.
	CO3	Apply the principles of friction in various conditions for useful purposes.
	CO4	Find the centroid and centre of gravity of various components in engineering systems.
	CO5	Select the relevant simple lifting machine(s) for given purposes.

GRAPHICAL REPRESENTATION

Bloom's Level Wise Mark Distribution



Course Outcome Wise Mark Distribution

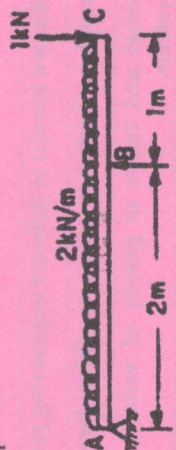


Program	Mechanical & Mechatronics Engineering	Branch	Diploma
Subject Name	Engineering Mechanics	Session	Even, 2024-2025
Semester	II	Year	June, 2025
• Start writing from 2nd page onwards; <u>Don't Write on the 1st Page Backside</u> • Answer all Questions of Section A (Compulsory) • Answer Any Four out of Six of Section B • Answer Any Three out of Five of Section C • Possession of Mobile Phones or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will comes under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Papers.</u>			
Time: 3 Hour Max. Marks : 70			
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.N	QUESTIONS	Marks	COs	KL	PO
i	Enlist the different types of supports in beams	2	CO4	K1	PO1
ii	By using resolution method, Find resultant and angle of resultant.	2	CO4	K2	PO3
iii	Find equivalent load and point of action in a Uniformly Distributed Load of a cantilever beam.	2	CO5	K3	PO5
iv	Discuss in brief law of transmissibility of Forces.	2	CO4	K1	PO1
v	Explain Polygon law of forces.	2	CO1	K4	PO2
vi	Differentiate coefficient of friction and angle of friction.	2	CO4	K1	PO1
vii	Describe free body diagram for a body resting on rough inclined plan.	2	CO1	K4	PO5
viii	Explain Varignon's principle.	2	CO1	K1	PO1
ix	Discuss in brief Lami's theorem and show using diagram.	2	CO5	K3	PO1
x	What is UVL load in beam and find equivalent load and point of action of beam.	2	CO1	K2	PO2

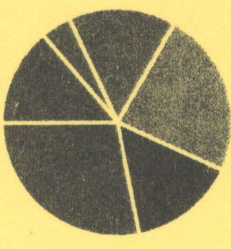
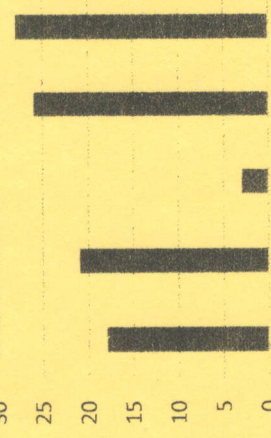
Section B (Answer any FOUR out of SIX) - 20 Marks (Each question Carry 5 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Draw Free Body Diagram of a ball of weight W supported by a string AB and resting against a smooth vertical wall at C .	5	CO4	K3	PO1
3	A Triangle ABC has its side $AB = 42$ mm, along positive x -axis and side $BC = 30$ mm along positive y -Axis. Three forces of 45 N, 50 N and 30 N act along the sides AB , BC and CA respectively. Determine magnitude of the resultant of such a system of forces.	5	CO2	K1	PO2
4	Write the equation of equilibrium of a rigid body in two dimension.	5	CO1	K2	PO3
5	Differentiate between beam and column. Explain different types of beam.	5	CO3	K1	PO2
6	A particle is acted upon by three forces equal to 50 N, 100 N and 130 N, along the three sides of an equilateral triangle, taken in order. Find analytically or graphically the magnitude and direction of the resultant force.	5	CO3	K1	PO5
7	Two forces of 100 N and 150 N are acting simultaneously at a point. What is the resultant of these two forces, if the angle between them is 45° .	5	CO4	K2	PO4
Section C (Answer any THREE out of FIVE) - 30 Marks (Each question Carry 10 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Elaborate the following. a) System of force b) Friction c) Lami's Theorem	10	CO3	K3	PO1
9	Show the Uniformly Distributed Load in a cantilever beam and find equivalent load and point of action.	10	CO1	K4	PO1
10	A force of 270 N pulls a body of weight 600 N up in an inclined plane, the force being applied parallel to the plane. If the angle of inclination of plane to the horizontal is 15° . Find the coefficient of friction.	10	CO5	K5	PO3

11	An overhanging beam carries the loads as shown in figure. Calculate the reactions at both the supports.	10	CO2	K5	PO5
					
12	Draw a semicircle and Trapezium, locate its centroid also answer the following. What is the location of Centre of gravity of a right circular cone? Enlist any four types of lifting machines.	10	CO5	K1	PO3

		ARKA JAIN University Jharkhand		NAAC GRADE A ACCREDITED UNIVERSITY		[26-06-2025] END SEM EXAMINATION School of Engineering & IT	
Program	Mechanical & Mechatronics Engineering			Branch	Diploma		
Subject Name	Environmental Science			Session	Even, 2024-2025		
Semester	II			Year	June, 2025		
Time: 1.5 Hour Max. Marks : 35		- Start writing from 2nd page onwards; <u>don't Write on the 1st Page</u> <u>Backside</u> - Answer all Questions of Section A (Compulsory) - Answer Any <u>Five</u> out of Six of Section B - Answer Any <u>Two</u> out of Four of Section C - Possession of <u>Mobile Phones</u> or any kind of <u>Written Material</u>, <u>Arguments with the Invigilator</u> or <u>Discussing with Co-Student</u> will comes under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers.</u>					
Knowledge Level (KL)	K1 : Remembering		K3 : Applying		K5 : Evaluating		
	K2 : Understanding		K4 : Analysing		K6 : Creating		

Section A (Each question Carry 01 Marks from Q1-i to x) – 10 Marks						
Q. N	QUESTIONS	Marks	COs	KL		
1						
i	Which of the following is said to be a biodegradable waste? a. Plastics c. Eggshell b. Glasses d. Polythene	1	CO1	K1		
ii	Which of the following is a renewable source of energy? a. Coal c. Wind b. Uranium d. None of the above	1	CO2	K2		
iii	The uses of CFCs are: a. Insulators c. Refrigerants b. Aerosol propellants d. All of the above	1	CO3	K3		
iv	Which of the following has a maximum speed? a. Light c. Sound b. Air d. Water current	1	CO2	K2		
v	The ozone layer is present in: a. Mesosphere c. Stratosphere b. Thermosphere d. None of the above	1	CO4	K4		
vi	Which of the following is the hottest planet of the solar system? a. Venus c. Jupiter b. Mercury d. Uranus	1	CO3	K3		

vii	Which of the following are the negative health effects of noise pollution? a. Hypertension b. Hearing loss c. Stress and headache d. All of the above	1	CO2	K2
viii	Which of the following is the coldest planet of the solar system? a. Venus b. Neptune c. Jupiter d. Mercury	1	CO3	K3
ix	On which day the world environment day is celebrated? a. 5th April b. 15th May c. 5th June d. 25th April	1	CO5	K5
x	Animals whose primary source of food is based on plants are known as - a. Carnivores b. Herbivores c. Omnivores d. None of the above	1	CO5	K5
Section B (Answer any FIVE out of SIX) – 10 Marks (Each question Carry 2 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
2	Define an ecosystem and explain its basic structure	2	CO1	K1
3	List the causes of soil pollution, including excessive use of fertilizers and pesticides	2	CO1	K2
4	List the major new energy sources and their importance	2	CO2	K2
5	Differentiate between a food chain and a food web.	2	CO3	K3
6	Define solar energy and explain its basic principles	2	CO4	K4
7	Define E-waste and give examples of its sources	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	What do you mean by water pollution? What are the main sources of water pollution?	5	CO2	K2
9	Describe the differences between lentic and lotic ecosystems with examples	5	CO3	K3
10	Compare the carbon cycle and the nitrogen cycle in terms of processes and key reservoirs.	5	CO3	K3
11	How can solar dryers be used in food preservation? Provide real-world examples	5	CO4	K5
12	Design a sustainable waste management plan for an industrial zone	5	CO5	K5

CO- Course Outcomes,		KL- Knowledge Level,	PO - Program Outcome
Course Outcomes	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.	
GRAPHICAL REPRESENTATION			
Bloom's Level wise Marks Distribution		Course Outcome Wise Marks Distribution	
 ■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6		 CO1 CO2 CO3 CO4 CO5	

	ARKA JAIN University Jharkhand		[30-06-2025] END SEM EXAMINATION School of Engineering & IT
Program	Mechanical & Mechatronic	Branch	Diploma
Subject Name	Introduction to IT System	Session	Even, 2024-2025
Semester	II	Year	June, 2025
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 Mobile Phone 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 in the Cancellation of the Paper(s)</u>.			
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Q. N	QUESTIONS			Marks	COs	KL
1						
i	Explain the Main Memory in Computer.			2	CO1	K2
ii	Illustrate web browser			2	CO1	K3
iii	Compare Hardware and Software.			2	CO1	K4
iv	Explain how to use a search engine efficiently.			2	CO2	K2
v	Describe the role of the recycle bin in Windows operating systems.			2	CO2	K2
vi	Explain the functional parts of a computer with examples.			2	CO3	K2
vii	Illustrate how do networks enhance data communication?			2	CO5	K3
viii	Explain LAN.			2	CO5	K2
ix	Illustrate Secondary Memory.			2	CO3	K2
x	Contrast the Primary Memory.			2	CO5	K4

Section B (Answer any FOUR out of SIX) – 20 Marks (Each question Carry 05 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
2	Contrast the different types of computers based on size and purpose.	05	CO2	K4
3	Compare HDD and Pen drive? Provide examples of each.	05	CO1	K4
4	Explain the features of an HDD? How does it differ from SSDs?	05	CO1	K2
5	Identify the key difference between Static Webpage and Dynamic Webpage.	05	CO4	K1
6	Illustrate how has the Internet transformed industries like education and healthcare?	05	CO3	K3
7	Compare DRAM and SRAM.	05	CO5	K4
Section C (Answer any THREE out of FIVE) – 30 Marks (Each question Carry 10 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
8	Describe the role of peripheral devices in a computer system. Provide examples of input and output devices.	10	CO5	K2
9	Illustrate the importance of web browsers and explain how to use them effectively for accessing information.	10	CO3	K3
10	Explain Digital India? Describe its key initiatives and the importance of state and national portals.	10	CO1	K2
11	Describe the steps involved to create a registration form using HTML, CSS.	10	CO4	K2
12	Compare Webpage and Website.	10	CO5	K4

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

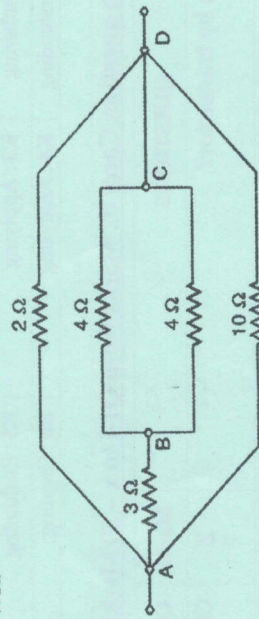
Course Outcomes	CO1	Comfortably work on computer, install and configure OS
	CO2	Assemble a PC
	CO3	Connect it to external devices, write documents
	CO4	Create worksheets, prepare presentations
	CO5	Protect information and computers from basic abuses/attacks
GRAPHICAL REPRESENTATION		
Bloom's level wise Marks Distribution		Course Outcome wise Marks Distribution
 ■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6		 CO-1 CO-2 CO-3 CO-4 CO-5

 ARKA JAIN University Jharkhand			[02-07-2025] END SEM EXAMINATION School of Engineering & IT	
Program	Mechanical & Mechatronics	Branch	Diploma	
Subject Name	Fundamentals of Electrical and Electronics Engineering	Session	Even, 2024-25	
Semester	II	Year	June, 2025	
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 Mobile Phone or any kind of Written Material, Arguments with the Invigilator or Discussion with Co-Student will comes under Unfair Means and will Result in the Cancellation of the Paper(s).		
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.N	QUESTIONS	Marks	COs	KL
i	What does mean by transistor?	2	CO1	K1
ii	What do you mean by Non-Periodic Signal?	2	CO1	K2
iii	Why logic gates are called universal gates?	2	CO2	K1
iv	Write down the abbreviation of Op-Amp and its type?	2	CO2	K2
v	What is electric power?	2	CO3	K1
vi	Define the term "Fleming's left hand rule".	2	CO3	K2
vii	Define RMS value and average value related to alternating waveform.	2	CO4	K2
viii	What are step-up transformer and step-down transformer?	2	CO5	K3
ix	What type of losses occurs in a transformer?	2	CO5	K1
x	The Transformer works on which principle?	2	CO5	K2

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 an OR gate.	05	CO2	K6
4	Write down the difference between series and parallel circuits.	05	CO3	K3
5	Explain AC circuit with pure resistor.	05	CO4	K2
6	Write down the difference between core type and shell type transformer.	05	CO5	K5
7	Determine the equivalent resistances of the circuit shown:	05	CO1	K5



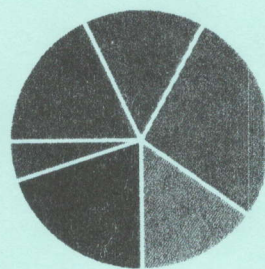
Section C (Answer any THREE out of FIVE) - 30 Marks (Each question Carry 10 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
8	Derive the expression for emf equation of a transformer.	10	CO1	K1
9	Write down the analogy between electric and magnetic circuits.	10	CO2	K3
10	Explain the voltage transformation ratio and current transformation ratio of a transformer.	10	CO3	K4
11	Describe briefly about the following terms related to AC circuits: (1) Time period (2) Cycle (3) Instantaneous value (4) Peak factor.	10	CO4	K3
12	The number of turns in the secondary coil of a 22 kVA, 2200V/220V single-phase transformer is 50. Determine the following: (1) Number of primary turns (2) Number of secondary turns	10	CO5	K5

(ii) Primary full load current (iii) Secondary full load current. Neglect all kinds of losses in the transformer.		
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CO- Course Outcomes,	KL- Knowledge Level,	PO - Program Outcome
CO1	Remembering the basic terminology/ definitions of electrical component & Signals.	
CO2	Understanding the Analog electronic Specially Op-Amp, Digital Electronics, half wave & full wave rectifier and their applications	
CO3	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.	
CO4	Analyzing the formulation and solution of simple and complex AC, DC circuits	
CO5	Evaluating the requirement of transformers and the type of electrical machine used for that particular application.	

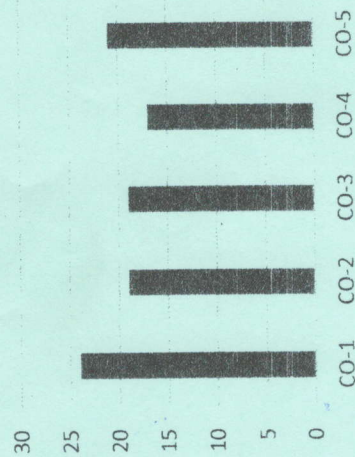
GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome wise Marks Distribution



 ARKA JAIN University Jharkhand		 NAAC GRADE A ACCREDITED UNIVERSITY	[21-06-2025] END SEM EXAMINATION School of Engineering & IT
Program	ME, EEE, CSE & Mechatronics	Branch	Diploma
Subject Name	Mathematics - II	Session	Even, 2024-2025
Semester	II	Year	June, 2025
Time: 3 Hour Max. Marks : 70	• Start writing from 2nd page onwards; <u>don't Write on the 1st Page Backside</u> • 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</u> , <u>Arguments with the Invigilator</u> or <u>Discussion with Co-Student</u> will comes under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation</u> of the <u>Paper(s)</u> . Paper(s): K1 : Remembering K3 : Applying K5 : Evaluating K2 : Understanding K4 : Analysing K6 : Creating		
Knowledge Level (KL)	K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing	K5 : Evaluating K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)				
Q.N	QUESTIONS	Marks	COs	KL
1				
i	What is the result of the multiplication $5 \times \begin{bmatrix} 5 & 0 \\ 2 & -3 \end{bmatrix}$	2	CO1	KL1
ii	Evaluate $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$	2	CO2	KL2
iii	What is a Square matrix? Give one example.	2	CO2	KL2
iv	Find the order and degree of the given differential equation : $\left(\frac{d^2y}{dx^2}\right) + \left(\frac{d^3y}{dx^3}\right)^4 = \frac{dy}{dx}$	2	CO1	KL1
v	Find the integral value a) $\int_0^2 x^2 dx$	2	CO3	KL3
vi	Differentiate $\frac{d}{dx} \{\sin(x^4 + 4)\}$	2	CO5	KL5
vii	Find the differential equation of $y = mx$, by eliminating arbitrary constant m.	2	CO2	KL2
viii	Construct a 2x2 matrix whose elements are given by $a_{ij} = i+j$	2	CO6	KL6
ix	Find the slope of the tangent to the curve $y = x^2$ at $x = 8$.	2	CO5	KL5
x	Check the function $f(x) = x^3$ is an even function or odd function.	2	CO3	KL3

Section B (Answer any FOUR out of SIX) – 20 Marks (Each question Carry 05 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
2	Find the product AB, if $A = \begin{bmatrix} 2 & 1 \\ 0 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 3 \\ 2 & 0 \end{bmatrix}$	05	CO4	KL4
3	Find the solution of the differential equation $\frac{dy}{dx} = \frac{x}{y}$, by variable separable method.	05	CO6	KL6
4	Find the differential equation of $y = ax + b$ by eliminating arbitrary constants a and b.	05	CO3	KL3
5	If $A = \begin{bmatrix} 4 & y+2 \\ 2y-3 & y+1 \end{bmatrix}$ is Symmetric Matrix, find y.	05	CO5	KL5
6	Find the integral $\int x \sin 2x \, dx$	05	CO4	KL4
7	Check the function $f(x) = x^4$ is an even function or odd function. Also find $f(2) = ?$	05	CO4	KL4
Section C (Answer any THREE out of FIVE) – 30 Marks (Each question Carry 10 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
8	Find the Adjoint and Inverse of the matrix $B = \begin{bmatrix} \cos \alpha & \sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$	10	CO2	KL2
9	Solve the system of linear equation using Cramer's Rule $x + 3y = 5$ $x + y = 3$	10	CO3	KL3
10	Find the derivatives of $\sin x$ by First Principle method.	10	CO5	KL5
11	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	CO5	KL5
12	Evaluate $\lim_{x \rightarrow 0} \frac{\sqrt{1+x} - \sqrt{1-x}}{x}$	10	CO6	KL6

CO- Course Outcomes,		KL- Knowledge Level,	PO – Program Outcome
Course Outcomes	CO1	Remembering several areas of mathematics beyond calculus	
	CO2	Understand to solve differential equations using appropriate methods.	
	CO3	Analyzing the Concepts of differentiation in physics & engineering courses	
	CO4	Evaluating the ODE of first degree, first order in engineering field	
	CO5	Creating interest in mathematics	
	CO6	Gain proficiency in calculus computations.	
GRAPHICAL REPRESENTATION			
Bloom's level wise Marks Distribution		Course Outcome wise Marks Distribution	