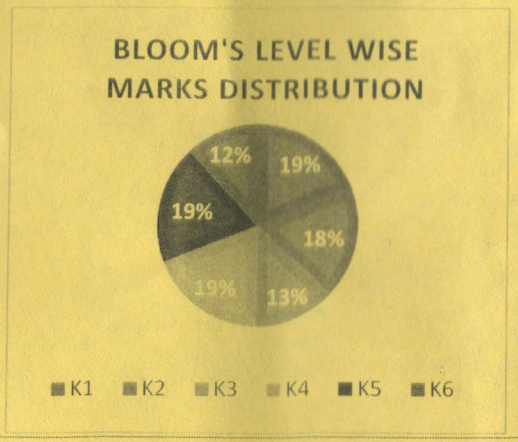
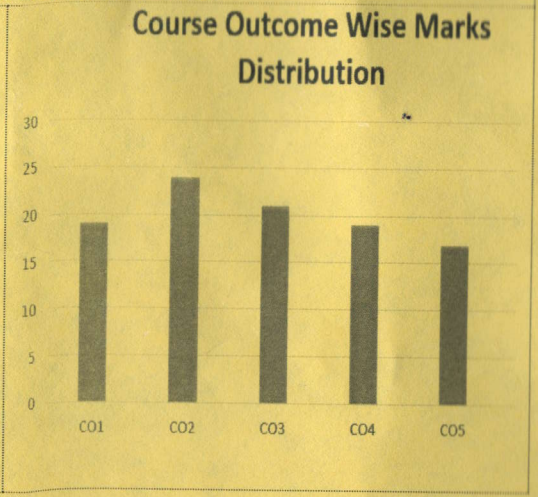
CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	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 behaviour of any electrical and magnetic circuits and Use the principles of electromagnetic induction in electrical applications
	CO4	Analysing 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





JGI **ARKA JAIN University** Jharkhand — NAAC GRADE A

END TERM EXAMINATION
School of Engineering & IT

Program	Diploma	Branch	EEE/CSE
Subject Name	Fundamentals of Electrical & Electronics Engineering	Session	Odd, 2025-26
Semester	I	Year	January, 2026

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**
- **Graph Paper / Drawing Sheet/ Log Book/ Ledger (please Mention if any)**
- **Possession of Mobile Phones** or any kind of **Written Material, Arguments with the Invigilator** or **Discussing with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Papers**.

Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Q. N 1	QUESTIONS	Marks	COs	KL
i	State one use of a capacitor.	2	CO1	K2
ii	Define frequency of AC supply	2	CO3	K5
iii	Give one application of a transformer.	2	CO1	K5
iv	State what is Ohm's law?	2	CO3	K5
V	What is the function of a transistor in a circuit?	2	CO4	K6
vi	Write the difference between voltage source and current source.	2	CO2	K2
vii	State how series and parallel resistor connections differ in terms of current flow.	2	CO2	K6
viii	What is the role of an operational amplifier when used as a voltage amplifier?	2	CO3	K4
ix	Two equal resistors are connected in series and then in parallel. Explain in which case the total resistance is higher.	2	CO4	K5
x	Electrical power depends on voltage and current. Explain how power changes when current increases.	2	CO5	K4

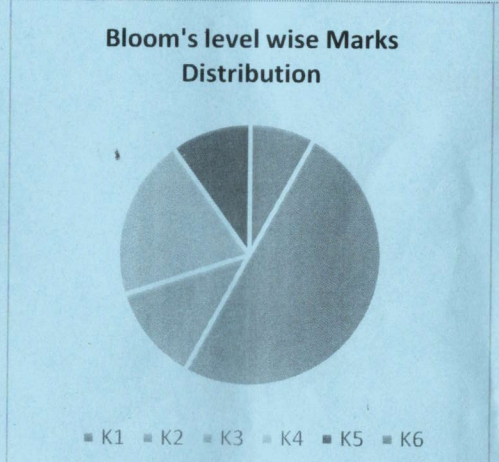
Q. No.	QUESTIONS	Marks	COs	KL
2	Explain forward biased P–N junction diode and its working in simple words.	5	CO2	K6

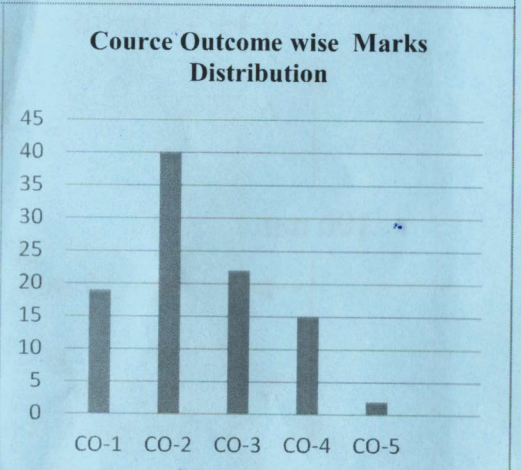
3	Give the truth table and symbolic representation of AND, OR and NOT operations.	5	CO4	K3
4	Explain ideal op-amp and list any four characteristics.	5	CO2	K3
5	A logic function is expressed as 1. F=(A+B)′+C 2. F=(M+N)′·P Apply De Morgan's law to the complemented term and write the final simplified expression.	5	CO1	K4
6	A resistor has colour bands 1. Brown – Black – Red – Gold. 2. Orange – Orange – Brown – Gold Calculate the resistance value and mention the tolerance.	5	CO3	K1
7	Explain the working of a step-up transformer.	5	CO5	K3
Q. No.	**QUESTIONS**	**Marks**	**COs**	**KL**
8	State the working of half wave rectifier with a circuit diagram and waveform.	10	CO2	K1
9	a) Explain the working of a diode in forward and reverse bias conditions. b) A silicon diode is connected to a 5 V DC supply through a resistor. Assume diode drop as 0.7 V. Calculate the voltage across the resistor.	10	CO4	K2
10	a) Explain cycle, frequency, and time period of an AC waveform. b. An AC supply has a frequency of 60 Hz. 1. Find the time period of the AC waveform. 2. Determine the number of cycles completed in 5 seconds.	10	CO1	K4
11	With a circuit diagram, explain common base transistor configuration and give its current amplification factor.	10	CO5	K4
12	Define: 1. Electric Current 2. Voltage 3. Inductance 4. Kirchhoff's voltage Law 5. Avalanche Breakdown	10	CO3	K5

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

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 center of gravity of various components in engineering systems.
	CO5	Select the relevant simple lifting machine(s) for given purposes.

GRAPHICAL REPRESENTATION





JGI **ARKA JAIN University** Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY

END SEM EXAMINATION
School of Engineering & IT

Program	**Diploma**	**Branch**	**EEE /CSE**
Subject Name	**Engineering Mechanics**	**Session**	**Odd, 2025-26**
Semester	**1st**	**Year**	**Jan, 2026**

Time: 3 Hour
Max. Marks : 70

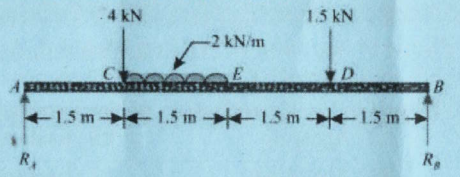
- Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**
- **Answer all Questions of Section A (Compulsory)**
- **Answer Any Four out of Six of Section B**
- **Answer Any Three out of Five of Section C**
- **Graf Paper / Drawing Sheet/ Log Book/ Ledger (please Mention if any)**
- **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

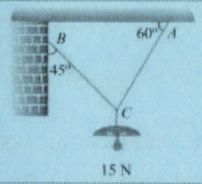
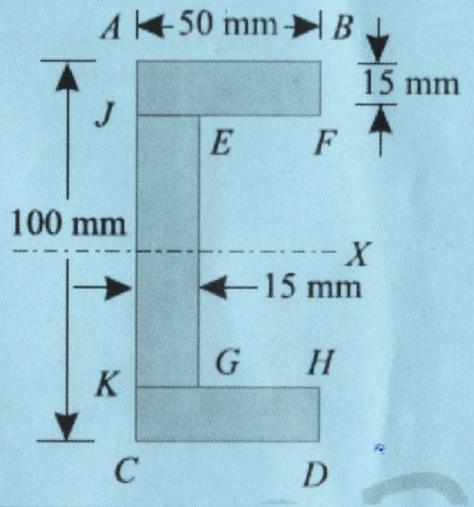
Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

Q. N 1	QUESTIONS	Marks	COs	KL
i	Explain the concepts of scaler quantities.	2	CO1	K2
ii	What is Mechanics and explain its significance in engineering applications.	2	CO2	K1
iii	What do you mean by couple and moment of couple?	2	CO2	K3
iv	State Lami's theorem.	2	CO1	K2
v	Explain the significance of equilibrium and equilibrant in mechanics.	2	CO2	K2
vi	State parallelogram Law of forces.	2	CO2	K1
vii	Define resolution of force with a suitable example.	2	CO1	K1
viii	explain coplanar forces with examples	2	CO2	K2
ix	Highlight the disadvantages of Friction.	2	CO3	K1
x	What is Efficiency of a machine?	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	Differentiate between Statics and Dynamics	05	CO1	K2
3	State and proof triangle law of vector addition	05	CO1	K2
4	A simply supported beam, AB of span 6 m is loaded as shown in Fig. Determine the reactions RA and RB of the beam 	05	CO2	K4
5	Analyze a concurrent force system using the law of the triangle of forces. Compare it with the parallelogram law of forces.	05	CO1	K4
6	Distinguish between centroid and centre of gravity.	05	CO4	K2
7	Differentiate between point load, inclined point load, and uniformly distributed load acting on a beam.	05	CO2	K2

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

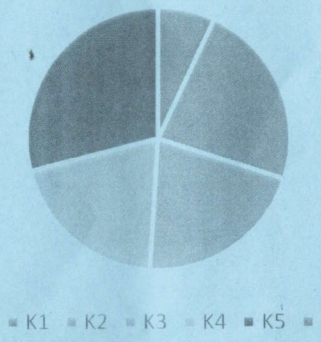
Q. No.	QUESTIONS	Marks	COs	KL
8	What is the angle of friction? How is it related to the coefficient of friction?	10	CO3	K3
9	Compare ideal machines and real machines. How does friction affect machine efficiency?	10	CO3	K2
10	An electric light fixture weighting 15 N hangs from a point C, by two strings AC and BC. The string AC is inclined at 60° to the horizontal and BC at 45° to the horizontal as shown in Fig. or otherwise, determine the forces in the strings AC and BC. 	10	CO2	K4
11	What is a Beam? Describe different types of beams with neat sketch.	10	CO2	K2
12	Evaluate the centre of gravity of a channel section 100 mm × 50 mm × 15 mm. 	10	CO4	K5

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

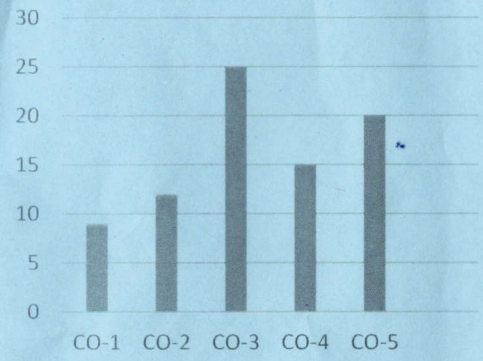
Course Outcomes	CO1	Comfortably work on computer, install and configure OS
	CO2	Assemble a PC
	CO3	Connect it to external devices, write documents,
	CO4	Create worksheets, prepare presentations
	CO5	Protect information and computers from basic abuses/ attacks.

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Cource Outcome wise Marks Distribution



ARKA JAIN University
Jharkhand

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END SEM EXAMINATION
School of Engineering & IT

Program	**Diploma**	**Branch**	**EEE/CSE**
Subject Name	**Introduction to IT System**	**Session**	**Odd, 2025-26**
Semester	**1st**	**Year**	**Jan, 2026**

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**
- **Graf Paper / Drawing Sheet/ Log Book/ Ledger (please Mention if any)**
- **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 1	QUESTIONS	Marks	COs	KL
i	Define a computer and its basic functions.	2	CO1	K1
ii	Differentiate between input devices and output devices.	2	CO1	K1
iii	What is a web browser? Name some popular web browsers.	2	CO2	K3
iv	Define hardware and software with examples.	2	CO3	K1
v	What is the role of an operating system in a computer?	2	CO4	K2
vi	How does a search engine work?	2	CO2	K3
vii	Differentiate between first-generation and fifth-generation computers.	2	CO1	K2
viii	Explain what is an IP address?	2	CO5	K4
ix	What are the functional parts of a computer?	2	CO4	K1
x	Explain the role of the Central Processing Unit (CPU)?	2	CO2	K2

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

Q. No.	QUESTIONS	Marks	COs	KL
2	List the advantages and disadvantages of computers.	05	CO1	K2
3	Define HDD. How does it differ from SSD?	05	CO2	K1
4	What are the different types of storage devices? Give examples.	05	CO2	K2
5	Write about RAM? How is it different from ROM?	05	CO3	K1
6	What is an operating system? Explain its functions.	05	CO4	K2
7	Differentiate between first-generation and fifth-generation computers.	05	CO1	K2

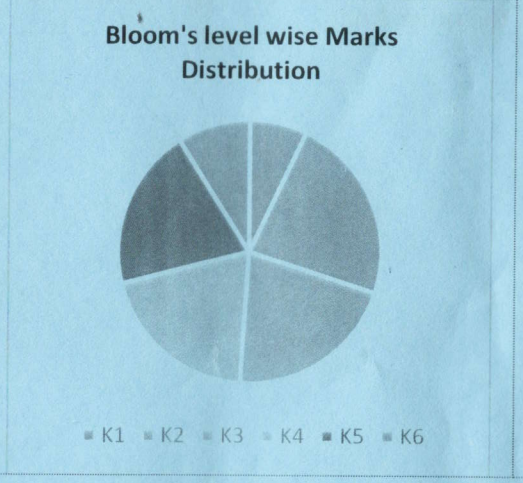
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

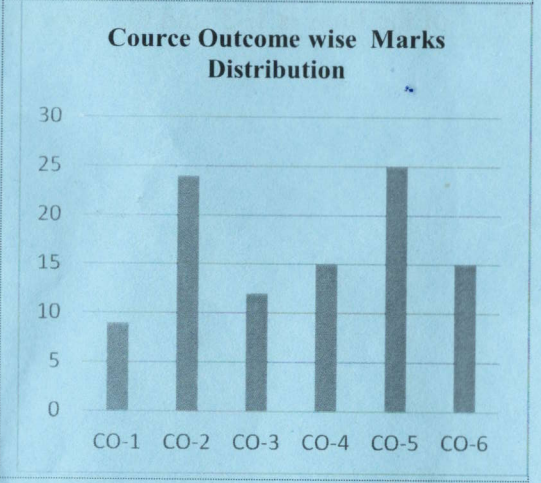
Q. No.	QUESTIONS	Marks	COs	KL
8	What is the purpose of the Recycle Bin? How do you restore a deleted file?	10	CO2	K1
9	Discuss the main applications of the Internet in daily life.	10	CO3	K2
10	Write the difference between the Internet and the World Wide Web (WWW)?	10	CO3	K1
11	Differentiate between LAN (Local Area Network) and WAN (Wide Area Network).	10	CO2	K3
12	Define and explain the following: 1. Server 2. Client 3. Protocols (e.g., HTTP, FTP)	10	CO4	K4

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

Course Outcomes	CO1	Able to apply the concept of Matrices &Determinants
	CO2	To understand about the Probability & Statistics
	CO3	Understand, predict and optimize engineering systems.
	CO4	Analysing about different forms of the equation of straight line and curves
	CO5	Analyse vectors in geometrically and algebraically.
	CO6	Evaluating why mathematical thinking is valuable in daily life

GRAFICAL REPRESENTATION





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Jharkhand
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END SEM EXAMINATION
School of Engineering & IT

Program	Diploma	Branch	EEE/ME/CSE/MT
Subject Name	Mathematics-I	Semester	1st
		Year	January 2026

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**
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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 1	QUESTIONS	Marks	COs	KL
i	Simplify $\frac{99!\ X\ 5!}{100!}$	2	CO1	K4
ii	Five digits are given 2, 4,5,3,1. How many 4- digits even numbers are possible if repetition is allowed.	2	CO3	K2
iii	Find the conjugate of the complex no. 5 + 7i.	2	CO2	K3
iv	Evaluate 6! + 7!	2	CO1	K2
v	Find a point on the x-axis, which is equidistant from the points (7, 6) and (3, 4).	2	CO3	K4
vi	If Sin A = 3/4, Calculate cos A and tan A.	2	CO6	K5
vii	Find the magnitude of the vector $\vec{a} = \hat{7\imath} + 2\hat{\jmath} + 0\hat{k}$	2	CO2	K1

viii	Find the slope of the line Passing through the points (3, – 2) and (–1, 4).	2	CO5	K4
ix	Find the number of permutations of the letters of the word ALLAHABAD	2	CO5	K5
x	Find the multiplicative inverse of 3 – 5i.	2	CO1	K2

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

(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
	If in two circles, arcs of the same length subtend angles 60° and 75° at the center, find the ratio of their radii.	05	CO5	K5
	Prove the following: Sin 2x + 2 Sin 4x + Sin 6x = $4cos^2$ x sin 4x	05	CO3	K2
	Express $(2 + 5i)^3$ in the form a + ib	05	CO4	K3
	Compute the magnitude of the following vectors a) $\vec{a} = \hat{\imath} + \hat{\jmath} + \hat{k}$ b) $\vec{b} = \hat{2\imath} - \hat{\jmath} + \hat{k}$ c) $\vec{d} = \hat{5\imath} + 2\hat{\jmath} + 0\hat{k}$	05	CO3	K4
	Find the sum of the vectors $\vec{a} = 2\hat{\imath} + 3\hat{\jmath} - 9\hat{k}$ and $\vec{b} = 3\hat{\imath} + 0\hat{\jmath} \widehat{-2k}$ .Also find the magnitude of $\vec{a}$ and $\vec{b}$.	05	CO4	K5
	How many 3-digit numbers can be formed from the digits 1, 2, 3, 4 and 5 assuming that a) Repetition of the digits is allowed. Repetition of the digits is not allowed.	05	CO6	K6

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

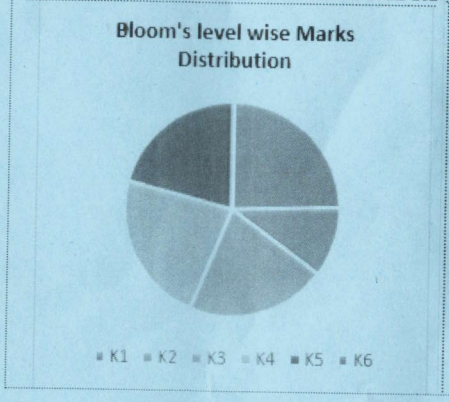
(Each question Carry 10 Marks)

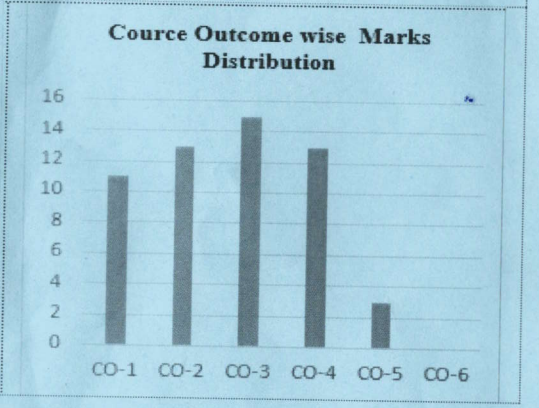
Q. No.	QUESTIONS	Marks	COs	KL
8	If 4x + i(3x – y) = 3 + i (– 6), where x and y are real numbers, then find the values of x and y.	10	CO2	K4
9	Prove that cot 4x (sin 5x + sin 3x) = cot x (sin 5x – sin 3x)	10	CO5	K6
10	Line through the points (–2, 6) and (4, 8) is Perpendicular to the line through the Points (8, 12) and (x, 24). Find the value of x.	10	CO4	K3
11	Find the values of other **five** trigonometric functions if cos x = -1/2, x lies in the third quadrant.	10	CO5	K4
12	If the angle between two lines is π/ 4 and slope of one of the lines is 1/ 2 find the slope of the other line.	10	CO1	K5

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

Course Outcomes	CO1	Remember the ecosystem and terminology and solve various engineering problems.
	CO2	Understand the suitable air, extent of noise pollution, and control measures and acts
	CO3	Analyze the water and soil pollution, and control measures and acts.
	CO4	Evaluate renewable energy resources and efficient process of harvesting
	CO5	Applying ecosystem knowledge to produce eco – friendly products

GRAPHICAL REPRESENTATION





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END SEM EXAMINATION
School of Engineering & IT

Program	**Diploma**	**Branch**	**DEEE, DCSE**
Subject Name	**Environmental Science**	**Session**	**Odd, 2025-26**
Semester	**1st**	**Year**	**Jan, 2026**

Time: 1.5 Hour
Max. Marks : 35

- Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**
- **Answer all Questions of Section A (Compulsory)**
- **Answer Any Five out of Six of Section B**
- **Answer Any Two out of Four of Section C**
- **Graf Paper / Drawing Sheet/ Log Book/ Ledger (please Mention if any)**
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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 v) – 05 Marks

Q. N 1	QUESTIONS	Marks	COs	KL
i	Define Noise Pollution.	01	CO2	K1
ii	What is Air Pollution?	01	CO2	K2
iii	Name any one Renewable energy source	01	CO4	K2
iv	What does the term "eco-friendly product" mean?	01	CO5	K1
v	Define an Ecosystem.	01	CO1	K1

Section B (Answer any FIVE out of SIX) – 10 Marks
(Each question Carry 02 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	List two major sources of Air pollution and their effects	02	CO2	K2
3	State two ways ecosystem knowledge can help in developing eco-friendly products.	02	CO5	K3
4	Explain the role of pH in determining water quality.	02	CO3	K2

5	Mention two harmful effects of Soil pollution on human health.	02	CO3	K4
6	Briefly explain the working principle of a solar photovoltaic system.	02	CO4	K1
7	Differentiate between Biotic and Abiotic components with one example each.	02	CO1	K5

Section C (Answer any TWO out of FOUR) – 20 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Analyze the structure and functions of an ecosystem with a neat diagram	10	CO1	K5
9	Discuss the causes, effects, and control measures of water pollution	10	CO3	K4
10	Discuss about various renewable energy resources	10	CO4	K1
11	Discuss about the causes of Air pollution and discuss suitable control measures	10	CO2	K3