17/01/25

ARKA JAIN University Jharkhand — NAAC GRADE A		**END SEM EXAMINATION** School of Engineering & IT	
Branch	EEE / CSE	**Program**	Diploma
Subject Name	Mathematics-I	**Semester**	I
		Year	January, 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 1	QUESTIONS	Marks	COs	KL
i	Find the value of $sin\ 3\,30° + cos\ 1\,20°$.	2	CO5	K1
ii	If Sin A = 3/4, calculate cos A and tan A.	2	CO1	K6
iii	How many 4-digit numbers can be formed by using the digits 1 to 9 if repetition of digits is not allowed?	2	CO4	K4
iv	If $z = 2 - 3i$, find $\bar{z}$.	2	CO1	K4
v	If $z = 2 - 3i$, find $z\bar{z}$ =?	2	CO6	K2
vi	If $A = (1,2)$, $B = (3,5)$ and $C = (6,7)$, find $\underset{AB}{\rightarrow}$ and $\underset{CB}{\rightarrow}$.	2	CO3	K3
vii	Find the value of $sin\ 3\,5°$	2	CO3	K5
viii	Evaluate 7 !	2	CO4	K4
ix	If 4x + i(3x – y) = 3 + i (– 6), where x and y are real numbers, then find the values of x and y.	2	CO3	K3
x	Find the number of permutations of the letters of the word ALLAHABAD.	2	CO3	K2

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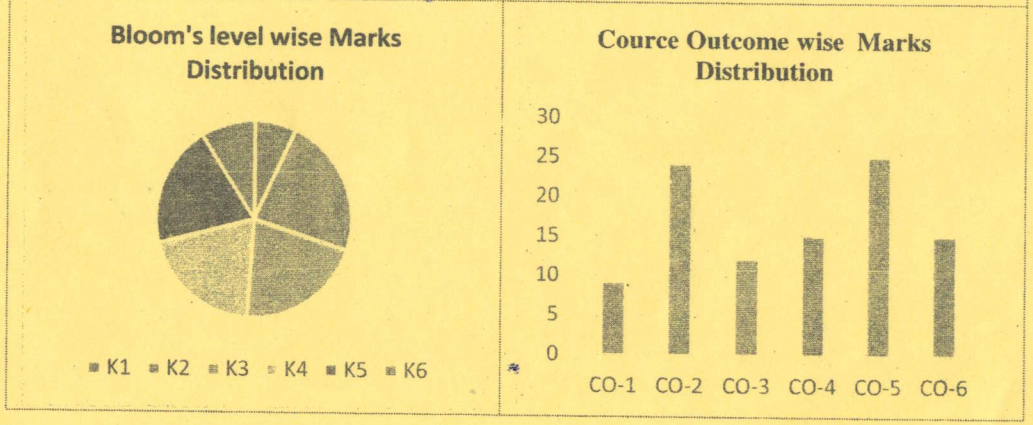
Section B (Answer any FOUR out of SIX) – 20 Marks (Each question Carry 05 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
2	Express $(5-3i)^3$ in the form a + ib	05	CO4	K4
3	Find the slope of the lines: (a) Passing through the points (3, – 2) and (–1, 4), (b) Passing through the points (3, – 2) and (7, – 2), (c) Passing through the points (3, – 2) and (3, 4)	05	CO3	K6
4	Five digits are given 1,2,3,4,5. How many three digits number are possible if repetition is not allowed?	05	CO1	K3
5	If the angle between two vectors $\vec{a} = \hat{\imath} - 2\hat{\jmath} + 3\hat{k}$ and $\vec{b} = 3\hat{\imath} - 2\hat{\jmath} + \hat{k}$ is 60^8, find their dot product .	05	CO4	K1
6	Find the equation of the line passing through the points (–2, 6) and (4, 8).	05	CO3	K3
7	Determine the multiplicative inverse of 4 – 3i.	05	CO6	K2

Section C (Answer any THREE out of FIVE) – 30 Marks (Each question Carry 10 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
8	How many 3-digit numbers can be formed from the digits 1, 2, 3, 4 and 5 assuming that (i) Repetition of the digits is allowed? (ii) Repetition of the digits is not allowed?	10	CO4	K5
9	Find the values of other all other trigonometric functions if cot x = ¾, x lies in the third quadrant.	10	CO3	K3
10	What is the angle between two vectors a and b with magnitude $\sqrt{3}$ and 4, respectively and $\vec{a}.\vec{b} = 2\sqrt{3}$.	10	CO4	K4
11	Find the sum of the vectors $\vec{a} = 2\hat{\imath} + 3\hat{\jmath} - 9\hat{k}$ and $\vec{b} = 3\hat{\imath} + 0\hat{\jmath} - 2\hat{k}$ .Also find the magnitude of $\vec{a} + \vec{b}$.	10	CO3	K6
12	How many numbers lying between 100 and 1000 can be formed with the digits 0, 1, 2, 3, 4, 5, if the repetition of the digits is not allowed?	10	CO1	K1

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

Course Outcomes	CO1	Apply the concept of trigonometric ratios angles in different field of engineering
	CO2	can remember the concept of vectors and use of vectors in mathematics.
	CO3	Understand, predict and optimize engineering systems.
	CO4	Analyzing about different forms of the equation of straight line and curves
	CO5	Analyze vectors in geometrically and algebraically.
	CO6	Evaluating why mathematical thinking is valuable in daily life

GRAPHICAL REPRESENTATION



20/01/25

JGI ARKA JAIN University Jharkhand — NAAC GRADE A ACCREDITED UNIVERSITY			END SEM EXAMINATION School of Engineering & IT
B ranch	EEE / CSE	Program	Diploma
Subject Name	Environmental Science	Semester	I
		Year	January, 2025
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** • **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

Section A (Each question Carry 01 Marks from Q1-i to v) – 05 Marks

Q. N 1	QUESTIONS	Marks	COs	KL
i	Define Eco-System with an example.	01	CO1	K1
ii	Define environment. Mention its components.	01	CO1	K2
iii	Define consumers, producers and de-composers.	01	CO3	K2
iv	Define Pollution.	01	CO2	K1
v	What are types of acid rain?	01	CO5	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Discuss about the prime characteristics of: i. Forest Ecosystem ii. Desert Ecosystem	02	CO1	K4
3	Bring few methods to conserve biodiversity.	02	CO 1	K6
4	What is Municipal Solid Wastes?	02	CO 5	K1
5	What is meant by automobile pollution?	02	CO 5	K1
6	Describe about Wind Energy.	02	CO 4	K2

7	Illustrate any four hazardous wastes.	02	CO 4	K4

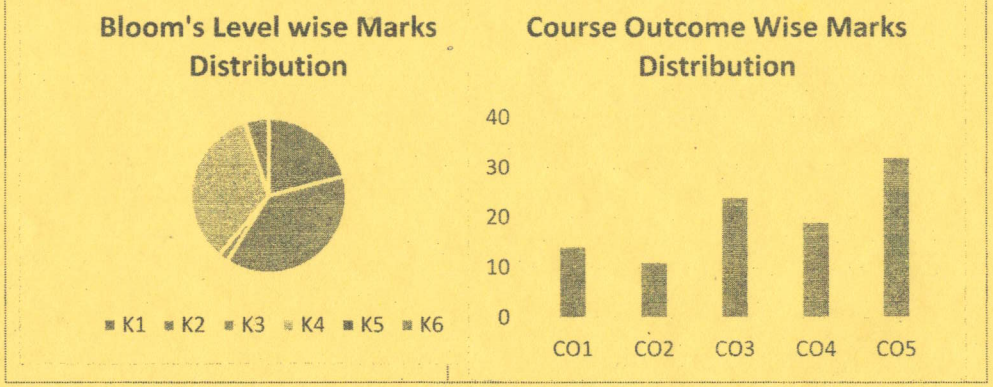
Section C (Answer any TWO out of FOUR) – 20Marks
(Each question Carry 10 Marks)

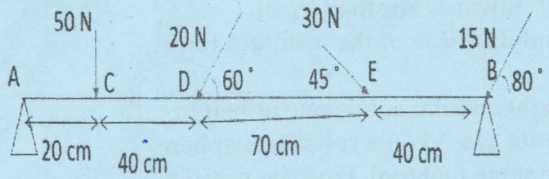
Q. No.	QUESTIONS	Marks	COs	KL
8	Explain the components and functions of a Forest ecosystem.	10	CO 1	K5
9	Mention the sources, effects and control method of air pollution of various air pollutant.	10	CO 5	K4
10	What are the sources, effects & control measures of Marine pollution?	10	CO 2	K1
11	Discuss on Ocean thermal energy and tidal energy with its environmental benefits and problems.	10	CO 4	K3

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

Course Outcomes	CO1	Define the ecosystem and terminology related.
	CO2	Understand the water and soil pollution, and control measures and act.
	CO3	Solve various engineering problems applying ecosystem knowledge to produce eco – friendly products.
	CO4	Compare different renewable energy resources and efficient process of harvesting.
	CO5	Estimate the suitable air, extent of noise pollution, and control measures and acts.

GRAPHICAL REPRESENTATION



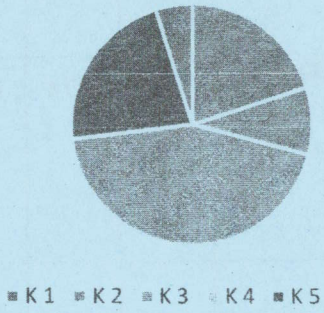
12	Find the reactions at A and B supports.  	10	CO3	K2

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

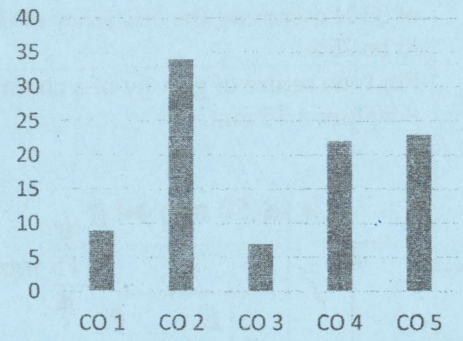
Course Outcomes	CO1	The force systems for given conditions by applying the basics of mechanics.
	CO2	Determine unknown force(s) of different engineering systems.
	CO3	Apply the principles of friction in various conditions for useful purposes.
	CO4	Find the centroid and centre of gravity of various components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

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Course Outcome wise Marks Distribution



22/01/25

ARKA JAIN University Jharkhand — NAAC GRADE A — ACCREDITED UNIVERSITY

END SEM EXAMINATION
School of Engineering & IT

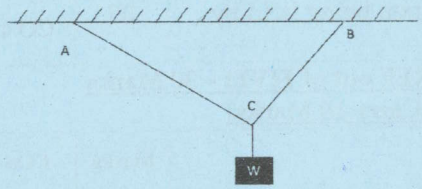
Branch	EEE / CSE	Program	Diploma
Subject Name	Engineering Mechanics	Semester	I
		Year	January, 2025

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
- Scientific Calculators are allowed.
- 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).

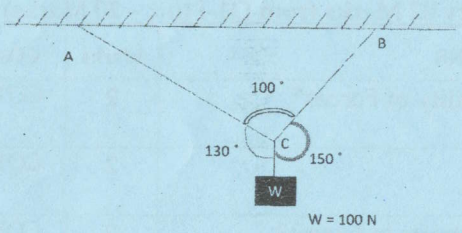
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

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

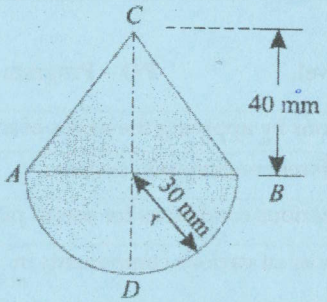
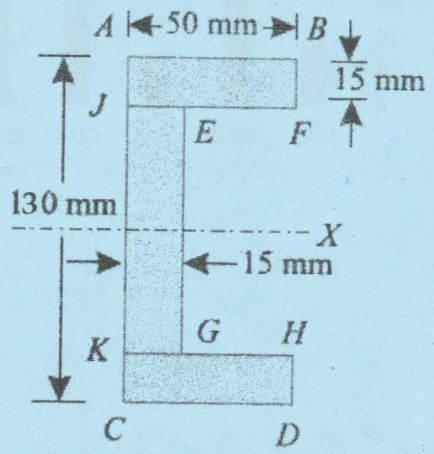
Q. N 1	QUESTIONS	Marks	COs	KL
i	Define "The law of transmissibility of Forces".	2	CO1	K1
ii	State Polygon law of forces.	2	CO1	K2
iii	What are different types of supports in beams?	2	CO3	K2
iv	Draw Free Body Diagram of a ball of weight W supported by two strings as shown in the figure.  	2	CO2	K1
v	Define coefficient of friction and angle of friction.	2	CO5	K1
vi	Draw free body diagram for a body resting on rough inclined plan.	2	CO1	K1
vii	Draw a Semi circle and locate its centroid.	2	CO1	K2
viii	Enlist any 4 types of lifting machines.	2	CO3	K2

ix	Define the term velocity ratio.	2	CO5	K1
x	Draw diagram of simple wheel and axle lifting machine.	2	CO1	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	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 50 N, 40N and 30N act along the sides AB, BC and CA respectively. Determine magnitude of the resultant of such a system of forces.	05	CO1	K4
3	Explain working of Worm and worm Wheel with neat sketch.	05	CO 1	K6
4	Explain any one system of pulleys as lifting machine. Find equation for velocity ratio for the same.	05	CO 5	K1
5	Find Tensions in the strings using Lame's Theorem. 	05	CO 5	K1
6	Find minimum pull force required along plane to just move a body of weight 100 N in an 30° inclined plane. Consider coefficient of friction as 0.25.	05	CO 4	K2
7	Draw the free body diagram of the pen being held by you while writing.	05	CO 4	K4

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

Q. No.	QUESTIONS	Marks	COs	KL
8	Four forces of 50N, 40 N, 30N and 20 N are acting simultaneously along straight lines OA, OB, OC, and OD such that <AOB = 45°, <BOC = 90° and <COD = 125°. Find analytically or graphically magnitude and direction of the resultant force. 10. The following forces act at a point : (i) 20 N inclined at 30° towards North of East. (ii) 25 N towards North. (iii) 30 N towards North West and (iv) 35 N inclined at 40° towards South of West. Find the magnitude and direction of the resultant force.	10	CO 1	K5
9	A body consists of a right circular solid cone of height 40 mm and radius 30 mm placed on a solid hemisphere of radius 30 mm of the same material. Find the position of centre of gravity of the body. 	10	CO 5	K4
10	In a differential wheel and axle, the diameter of the effort wheel is 400 mm. The radii of the axles are 160 mm and 100 mm respectively. The diameter of the rope is 10 mm. Find the load which can be lifted by an effort of 35 N assuming the efficiency of the machine to be 75%.	10	CO 2	K1
11	Find the centre of gravity of a channel section 130 mm × 50 mm × 15 mm. 	10	CO 4	K3

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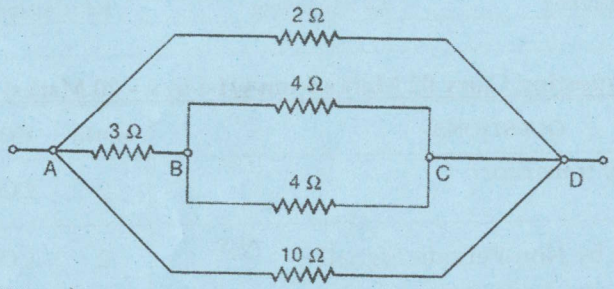
JGI ARKA JAIN University Jharkhand — NAAC GRADE A ACCREDITED UNIVERSITY			END SEM EXAMINATION School of Engineering & IT
Branch	EEE / CSE	Program	Diploma
Subject Name	Fundamentals of Electrical and Electronics Engineering	Semester	I
		Year	January, 2025
Time: 3 Hour Max. Marks : 70	• Start writing from 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 1	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 are logic gates 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 "Flemings left hand rule".	2	CO3	K2
vii	Define RMS value and average value related to alternating waveform.	2	CO4	K2
viii	What is 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 a OR gate.	05	CO2	K6
4	Describe briefly about the hysteresis loop.	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

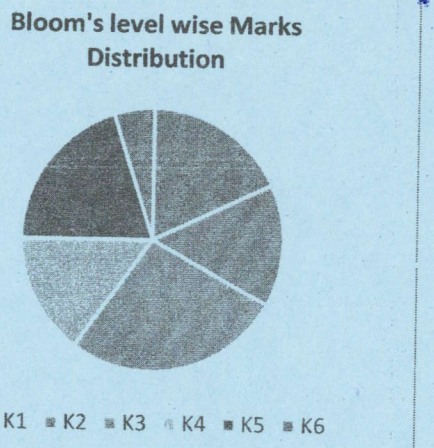
Section C (Answer any THREE out of FIVE) – 30 Marks-
(Each question Carry 10 Marks)

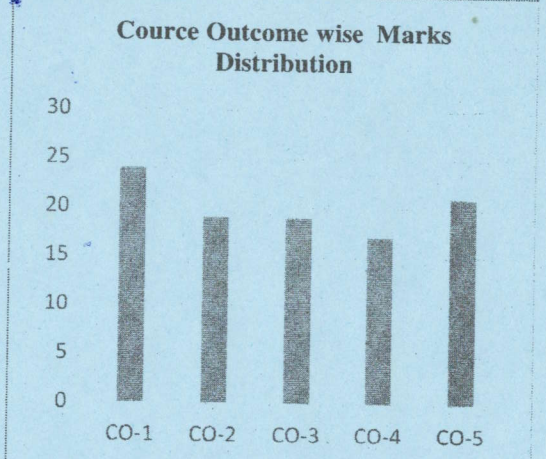
Q. No.	QUESTIONS	Marks	COs	KL
8	Write down the short notes on the followings, including their symbol and S.I. units: a) Capacitor b) Ideal and Practical Voltage Source c) Resistivity	10	CO1	K1
9	Write down the analogy between electric and magnetic circuits.	10	CO2	K3
10	Explain the voltage transformation 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 of the followings: (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

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 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.

GRAFICAL REPRESENTATION





28/01/25

ARKA JAIN University, Jharkhand — NAAC GRADE A			END SEM EXAMINATION School of Engineering & IT
Branch	EEE & CSE	Program	Diploma
Subject Name	Introduction to IT System	Semester	I
		Year	January, 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 1	QUESTIONS	Marks	COs	KL
i	Explain the role of an IP address in Internet communication.	2	CO1	K2
ii	Illustrate web browser along with example.	2	CO1	K3
iii	Compare system software and application 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 primary uses of the Internet in daily life?	2	CO3	K2
vii	Illustrate how do networks enhance data communication?	2	CO5	K3
viii	Explain information security.	2	CO5	K2
ix	Illustrate search engine	2	CO3	K3
x	Compare ethical hacking and malicious hacking	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 hardware and software? 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 a presentation and a document?	05	CO4	K1
6	Illustrate computer network, and how does it differ from a standalone computer system	05	CO3	K3
7	Compare domain name and an IP address?	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 role of a web browser in accessing the World Wide Web? Name three commonly used web browsers.	10	CO3	K3
10	Explain Digital India? Describe its key initiatives and the importance of state and national portals.	10	CO1	K2
11	Describe URL, and how is it structured? Explain the difference between a URL and a domain name.	10	CO4	K2
12	Compare LAN (Local Area Network) and WAN (Wide Area Network). Provide examples of each.	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