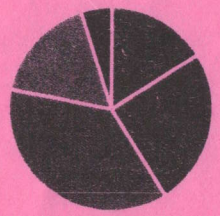
CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

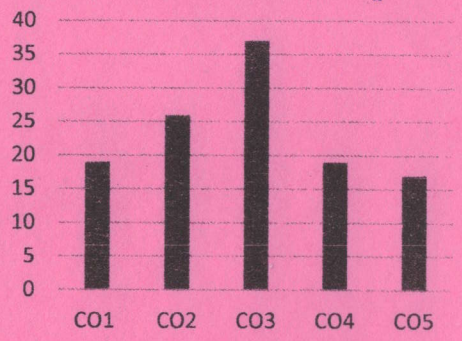
Course Outcomes	CO1	Apply the principles of logic, proofs, and set theory to solve discrete mathematical problems.
	CO2	Remember and use relations, functions, and recurrence relations in computational applications.
	CO3	Apply combinatorial techniques and understand the basics of counting principles.
	CO4	Analyze and model problems using graphs and trees.
	CO5	Develop mathematical reasoning and discrete structures in computer science.

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Course Outcomewise Marks Distribution



ARKA JAIN University
Jharkhand

NAAC GRADE A
ACCREDITED UNIVERSITY

[31-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	Bachelor of Computer Application [Regular / AIDL / Cyber Security]		
Subject Name	Discrete Mathematics	Session	Odd, 2025-26
Semester	I	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**
- **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	If $U = \{1,2,3,4,5\}$ and $A = \{2,5\}$, then $A' =$	02	CO1	K1
ii	If A={x | x is odd}, B={1,2,3}, then A∩B =?	02	CO2	K2
iii	When is a relation R on a set called reflexive?	02	CO2	K1
iv	Find the domain of the relation {(1,3), (2,5), (6,8)}.	02	CO2	K2
v	Define sequence with an example.	02	CO4	K2
vi	In strong induction, for which values are the statement assumed to be true?	02	CO4	K2
vii	What is meant by graph isomorphism?	02	CO5	K4
viii	Explain shortest path between two vertices.	02	CO1	K2
ix	What is the probability of obtaining an odd number when a fair die is rolled?	02	CO3	K3
x	In how many ways can 3 objects be selected from a set of 10 objects?	02	CO5	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	If $A = \{1,3,4,5,6,7\}$, B =even numbers, $C = \{2,3,4,5,6\}$, find $(A \cap B) - C$	05	CO1	K2
3	Test whether R on A={1,2,3,4} is reflexive: $R = \{(1,1),(2,2),(1,3),(2,4),(3,3),(3,4),(4,4)\}$.	05	CO2	K3
4	What is Bayes' Theorem? Explain.	05	CO2	K4
5	Define recursive sequences and solve using iteration: $a_n = 2a_{n-1} + 3, a_0 = 1$.	05	CO3	K3
6	Draw tree diagram of two-dice experiment and list the sample space.	05	CO4	K5
7	Compute the probability that the first ball drawn is red and the second ball drawn is blue from a bag containing 7 blue, 5 yellow, and 3 red balls.	05	CO5	K3

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

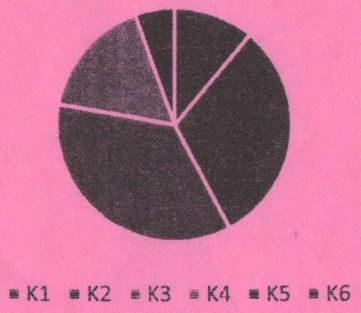
Q. No.	QUESTIONS	Marks	COs	KL
8	Explain tree isomorphism with diagrams.	10	CO4	K4
9	Explain mathematical induction and strong induction. Prove a suitable identity using both methods.	10	CO3	K3
10	Prove that $f(x) = 2x - 3$is bijective. For $f(x) = 2x + 1, g(x) = 4x - 7$, solve (i) $f(x) = g(x)$, (ii) $f(x) < g(x)$.	10	CO2	K2
11	Explain Cartesian product, properties, and compute $X \times Y \times Z$for sample sets.	10	CO1	K1
12	Two fair six-sided dice are rolled. Let the outcome be represented as an ordered pair (X, Y), where $X$is the result on the first die and $Y$is the result on the second die. I. Find the probability that the sum of the two dice is greater than 8. II. Find the probability that both dice show even numbers. III. Find the probability that at least one die shows a 6. IV. Given that the sum of the dice is 9, find the probability that the first die shows a 4. V. Find the probability that the product of the two dice is a multiple of 3.	10	CO5	K3

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

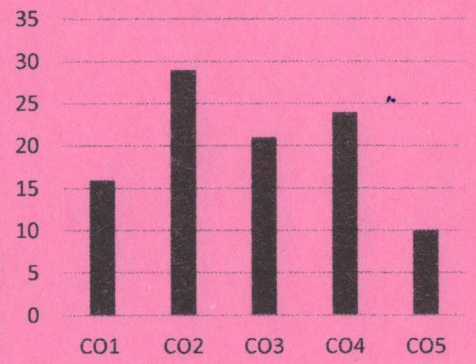
Course Outcomes	CO1	Understand the process of problem solving and algorithm development.
	CO2	Develop flowcharts and algorithms for computational problems.
	CO3	Apply C programming concepts for real-time problem solving.
	CO4	Write, debug, and execute modular and efficient C programs.
	CO5	Analyse program logic and implement memory-efficient solutions.

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Course Outcomewise Marks Distribution



ARKA JAIN University
Jharkhand

NAAC GRADE A
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[16-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Bachelor of Computer Application [Regular / AIDL / CS]**		
Subject Name	**Problem Solving Using C**	**Session**	**Odd, 2025-26**
Semester	**I**	**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**
- **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 do you mean by Pointer?	02	CO3	K2
ii	What are pre-processor directives?	02	CO1	K1
iii	What are operators? Give an example.	02	CO1	K1
iv	What do you mean by Function?	02	CO2	K2
v	Write down the purpose of using pseudo code in C.	02	CO1	K1
vi	What do you mean by dynamic memory allocation?	02	CO3	K2
vii	What is file handling?	02	CO4	K3
viii	What is a union?	02	CO4	K1
ix	Define 2D array.	02	CO3	K2
x	What is recursion?	02	CO2	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain the structure of a C program with an example.	05	CO1	K2
3	Differentiate between constants, variables, and keywords with examples.	05	CO1	K2
4	Discuss file operations (open, read, write, delete).	05	CO4	K3
5	Explain various looping statements in C with syntax and examples	05	CO2	K3
6	Differentiate between structure and union with memory diagrams.	05	CO4	K4
7	Write a Program in C to calculate the factorial of a given integer by using recursive functions.	05	CO3	K5

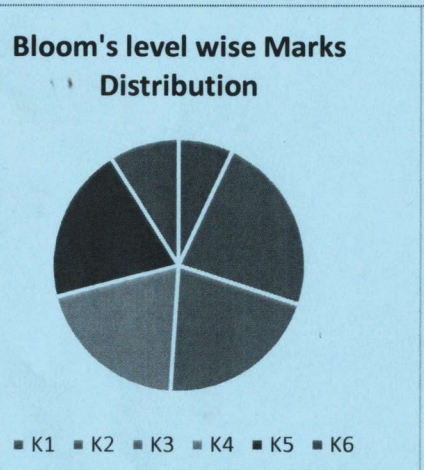
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

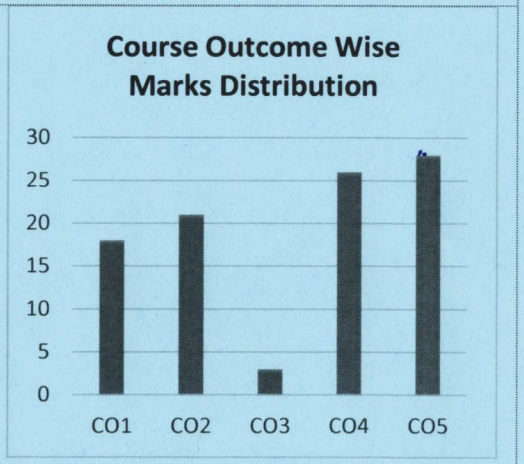
Q. No.	QUESTIONS	Marks	COs	KL
8	Explain string handling in C. Discuss any four string functions with examples.	10	CO3	K3
9	Explain the program development life cycle and tools used in C programming.	10	CO5	K2
10	Explain file management with example. Write a program in C to read and write in a file. Explain the functionality of fgets() and fputs().	10	CO4	K3
11	Write a program using switch-case to perform addition, subtraction, multiplication, and division.	10	CO2	K2
12	Explain call by value and call by reference. Write programs for both methods to swap two numbers and compare memory usage, execution, and results.	10	CO2	K4

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

Course Outcomes	CO1	Build the students' confidence and enhance competitiveness by projecting a strong personality.
	CO2	Improve their listening & speaking abilities.
	CO3	Write error-free content while improving vocabulary & grammar.
	CO4	Deliver effective oral business presentations.
	CO5	Demonstrate verbal and non-verbal communication abilities through presentations.

GRAPHICAL REPRESENTATION





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[27-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Bachelor of Computer Application [Regular / AIDL / Cyber Security]**		
Subject Name	**Business Communication**	**Session**	**Odd, 2025-26**
Semester	**I**	**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** • **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	State one example of a physical barrier in communication.	02	CO1	K1
ii	What is informal communication?	02	CO5	K2
iii	Mention any one type of business report.	02	CO1	K5
iv	What is the ideal length of a précis compared to the original passage?	02	CO3	K1
v	What is a formal telephonic conversation?	02	CO2	K5
vi	State any one principle of effective oral communication.	02	CO1	K4
vii	What is meant by group discussion (GD)?	02	CO4	K6
viii	Mention one skill required for effective participation in a group discussion.	02	CO3	K6
ix	Mention one commonly used safety symbol.	02	CO2	K3
x	What are helpful expressions in communication?	02	CO1	K6

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Describe the communication process or cycle with a neat explanation of each step.	05	CO5	K4
3	What are the common barriers to communication? Suggest practical ways to overcome these barriers.	05	CO2	K2
4	What are the key elements of basic communication skills? Explain with examples.	05	CO4	K6
5	What makes an oral business presentation effective? Explain important strategies and techniques.	05	CO1	K4
6	What is a group discussion? Write any four benefits of participating in a group discussion.	05	CO2	K6
7	Define speaking skills. Mention any four components needed to develop effective speaking skills.	05	CO3	K3

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

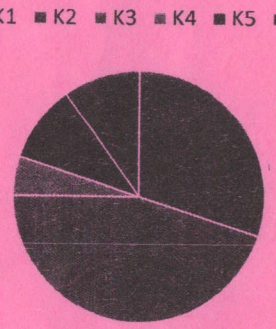
Q. No.	QUESTIONS	Marks	COs	KL
8	Discuss in detail the essential communication etiquette required during a group discussion. Explain the importance of body language, listening skills, language techniques, and respectful interaction.	10	CO5	K5
9	Describe in detail the role of body language in communication. Explain how posture, eye contact, gestures, and facial expressions support verbal communication.	10	CO4	K1
10	Analyze the barriers to entrepreneurship in the Indian context. How can these barriers be overcome through policy and education?	10	CO4	K4
11	Explain the concept of business opportunity identification. Discuss the steps involved in evaluating business opportunities.	10	CO5	K6
12	Discuss the objectives and benefits of Startup India, Make in India, and Digital India initiatives.	10	CO5	K3

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

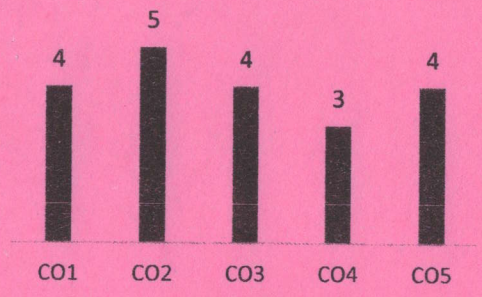
Course Outcomes	CO1	Remember the concept of entrepreneurship, its types, and role in economic development.
	CO2	Analyze business opportunities and apply creativity for idea generation.
	CO3	Create a comprehensive business plan including marketing, financial, and operational strategies.
	CO4	Evaluate various funding options and government support schemes.
	CO5	Apply entrepreneurial competencies with leadership, and decision-making skills.

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Cource Outcome wise Marks Distribution



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[29-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	Bachelor of Computer Application [Regular / AIDL]		
Subject Name	Entrepreneurship Development	Session	Odd, 2025-26
Semester	I	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**
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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	Define a business plan.	02	CO3	K5
ii	Mention one selection technique for project evaluation.	02	CO3	K2
iii	What is the purpose of make in india program.	02	CO4	K3
iv	Define business incubator.	02	CO4	K2
v	What is mean by family business.	02	CO5	K3
vi	State any two cause of startup failure.	02	CO5	K2
vii	List two characteristics of successful entrepreneurs.	02	CO1	K3
viii	What is social entrepreneurship?	02	CO1	K2
ix	State one importance of innovation for entrepreneurs.	02	CO2	K2
x	What do you mean by customer needs?	02	CO2	K3

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

Q. No.	QUESTIONS	Marks	COs	KL
2	What is risk and uncertainty in entrepreneurship? How can they be managed?	05	CO5	K4
3	Explain the importance of work-life balance for entrepreneurs.	05	CO5	K3
4	Define entrepreneurship and explain its importance in economic development.	05	CO1	K6
5	What is a business plan? Explain its main components.	05	CO3	K5
6	Discuss the objectives and benefits of the Startup India initiative.	05	CO4	K2
7	What is a business opportunity? Explain the process of opportunity identification.	05	CO2	K3

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

Q. No.	QUESTIONS	Marks	COs	KL
8	Compare and contrast the characteristics and roles of entrepreneurs and intrapreneurs, with suitable case studies.	10	CO1	K3
9	Discuss in detail the importance of entrepreneurship in shaping the economic development of a nation. Provide relevant examples.	10	CO1	K6
10	Discuss hoe excel supports enterprise planning.	10	CO2	K3
11	Explain market segmentation and its importance for entrepreneurs.	10	CO2	K3
12	Describe various sources of startup financing, including venture capital and angel investors.	10	CO3	K5

JGI	ARKA JAIN University Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	[21-01-2026] END SEM EXAMINATION School of Engineering & IT.

Program	**Bachelor of Computer Application [Regular / AIDL / CS]**		
Subject Name	**Environmental Studies**	**Session**	**Odd, 2025-26**
Semester	**I**	**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** • **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 Mark from Q1-i to v) – 05 Marks

Q. N 1	QUESTIONS	Marks	COs	KL
i	What is an ecosystem?	01	CO1	K1
ii	Define a food chain.	01	CO1	K1
iii	What is meant by sustainable development?	01	CO2	K1
iv	Name any one major global environmental issue.	01	CO3	K1
v	Write any one effect of population growth on the environment.	01	CO3	K2

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

Q. No.	QUESTIONS	Marks	COs	KL
2	What is an ecosystem? Briefly mention its two main structural components.	02	CO1	K2
3	What is an ecological pyramid? Name any two types of ecological pyramids.	02	CO1	K1
4	State any two problems caused by rapid population growth.	02	CO3	K2

5	What is the Family Welfare Program? Mention its three objectives.	02	CO5	K1
6	What are resources? Give one example of a natural resource.	02	CO2	K1
7	What is water pollution? Mention any one major source of water pollution	02	CO2	K2

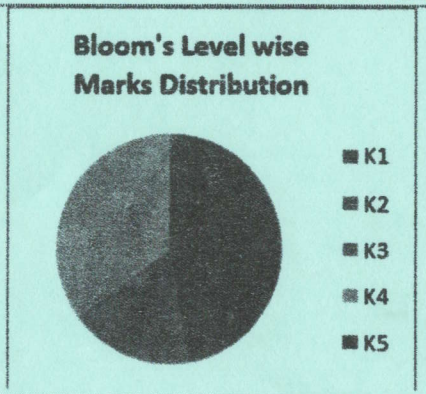
Section C (Answer any TWO out of FOUR) – 20 Marks
(Each question Carry 10 Marks)

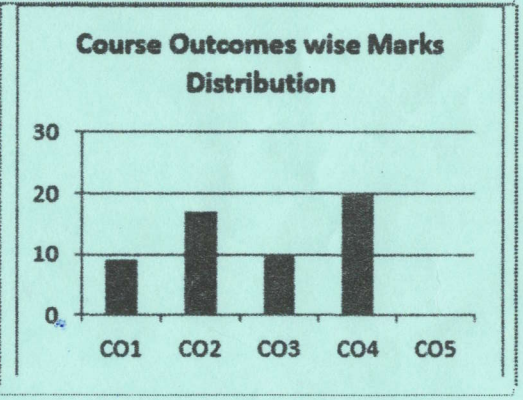
Q. No.	QUESTIONS	Marks	COs	KL
8	Define biodiversity and explain its major issues.	10	CO3	K2
9	Explain the problem of population growth and population explosion. Discuss their causes, effects on the environment, and measures to control them.	10	CO3	K4
10	Explain soil degradation and land degradation in detail. Discuss their causes, effects, and control measures.	10	CO2	K4
11	Discuss the role of Information Technology (IT) in environmental monitoring.	10	CO5	K3

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

Course Outcomes	CO1	Concept clarification about the components of environment and their inter relatedness.
	CO2	Understanding of all the resources available and their origin and the ways to conserve them for sustainable future.
	CO3	To evaluate the environment and various species present and their importance and ways to conserve biodiversity.
	CO4	To construct and evaluate ways of managing solid waste and safe disposal techniques.
	CO5	To understand various measures undertaken by Govt. and Laws related to protection of environment.

GRAPHICAL REPRESENTATION

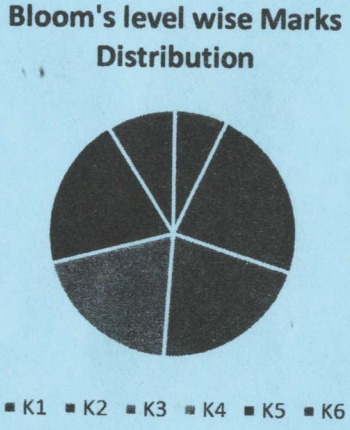


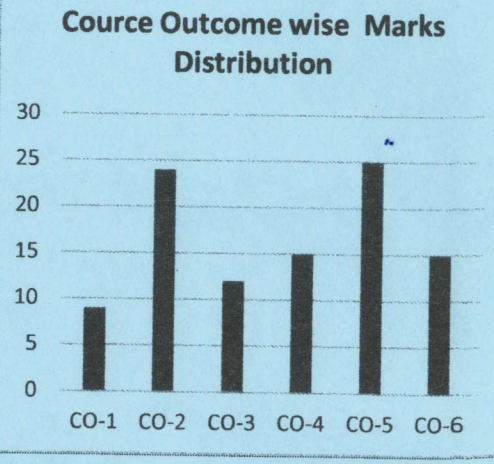


CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Understand the fundamentals of Computer Architecture.
	CO2	Learn about components and subsystems of Computer Architecture.
	CO3	Explore real-world applications of different computer Architecture
	CO4	Analyse case studies and real-world examples of Computer Architecture.
	CO5	Analyse the behaviour of memory hierarchy and cache memory

GRAPHICAL REPRESENTATION





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

[19-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Bachelor of Computer Application [Regular / AIDL]**		
Subject Name	**Computer Architecture**	**Session**	**Odd, 2025-26**
Semester	**I**	**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**
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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	What is instruction pipelining?	02	CO1	K1
ii	What is a data bus? State its main function.	02	CO4	K1
iii	Why are hexadecimal numbers used instead of binary in computer systems?	02	CO2	K1
iv	What is meant by the output of a combinational circuit being time-independent?	02	CO3	K2
v	What is interrupt-driven I/O?	02	CO1	K4
vi	What is meant by a cache hit?	02	CO4	K3
vii	What is cluster computing?	02	CO2	K1
viii	Name two main types of storage systems in a computer.	02	CO3	K2
ix	Name one key metric used to measure the performance of a storage system.	02	CO5	K1
x	What is a benchmark in computer systems?	02	CO1	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	What is the process for converting a hexadecimal number to octal? Describe the Steps involved.	05	CO1	K2
3	Define the basic operations in Boolean algebra.	05	CO4	K1
4	What distinguishes sequential circuits from combinational circuits?	05	CO2	K2
5	What is the primary function of the Control Unit in a CPU?	05	CO3	K1
6	What is instruction pipelining, and how does it improve CPU throughput?	05	CO5	K2
7	What are the main types of storage systems used in computer architecture?	05	CO1	K2

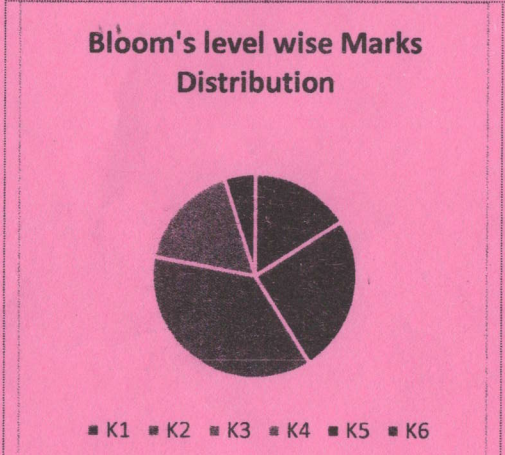
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

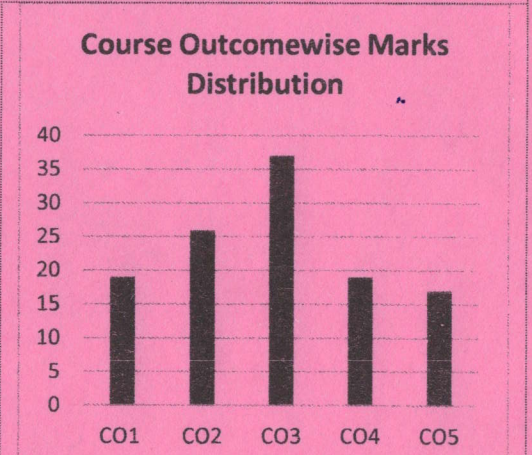
Q. No.	QUESTIONS	Marks	COs	KL
8	How would you convert the binary number 1101010 to decimal? Explain the conversion process and state the final decimal value.	10	CO2	K2
9	Describe the differences between volatile and non-volatile memory. Provide examples of each.	10	CO3	K3
10	Describe the structure of a traditional hard disk drive (HDD). What are its key Components?	10	CO5	K1
11	What are I/O devices, and how do they interact with the CPU? Explain the role of I/O Interfaces.	10	CO1	K4
12	How does flash memory work, and what types of flash memory are commonly used in SSDs? Explain in detail.	10	CO1	K2

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

Course Outcomes	CO1	Apply the principles of logic, proofs, and set theory to solve discrete mathematical problems.
	CO2	Remember and use relations, functions, and recurrence relations in computational applications.
	CO3	Apply combinatorial techniques and understand the basics of counting principles.
	CO4	Analyze and model problems using graphs and trees.
	CO5	Develop mathematical reasoning and discrete structures in computer science.

GRAPHICAL REPRESENTATION





ARKA JAIN University
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[31-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Bachelor of Computer Application [Regular / AIDL / Cyber Security]**		
Subject Name	**Discrete Mathematics**	**Session**	**Odd, 2025-26**
Semester	**I**	**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 • 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	If $U = \{1,2,3,4,5\}$ and $A = \{2,5\}$, then $A' =$	02	CO1	K1
ii	If A={x | x is odd}, B={1,2,3}, then A∩B =?	02	CO2	K2
iii	When is a relation R on a set called reflexive?	02	CO2	K1
iv	Find the domain of the relation {(1,3), (2,5), (6,8)}.	02	CO2	K2
v	Define sequence with an example.	02	CO4	K2
vi	In strong induction, for which values are the statement assumed to be true?	02	CO4	K2
vii	What is meant by graph isomorphism?	02	CO5	K4
viii	Explain shortest path between two vertices.	02	CO1	K2
ix	What is the probability of obtaining an odd number when a fair die is rolled?	02	CO3	K3
x	In how many ways can 3 objects be selected from a set of 10 objects?	02	CO5	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	If $A = \{1,3,4,5,6,7\}$, B =even numbers, $C = \{2,3,4,5,6\}$, find $(A \cap B) - C$	05	CO1	K2
3	Test whether R on A={1,2,3,4} is reflexive: $R = \{(1,1),(2,2),(1,3),(2,4),(3,3),(3,4),(4,4)\}$.	05	CO2	K3
4	What is Bayes' Theorem? Explain.	05	CO2	K4
5	Define recursive sequences and solve using iteration: $a_n = 2a_{n-1} + 3$, $a_0 = 1$.	05	CO3	K3
6	Draw tree diagram of two-dice experiment and list the sample space.	05	CO4	K5
7	Compute the probability that the first ball drawn is red and the second ball drawn is blue from a bag containing 7 blue, 5 yellow, and 3 red balls.	05	CO5	K3

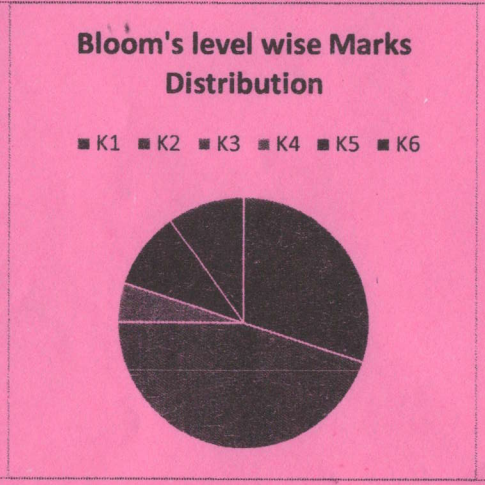
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

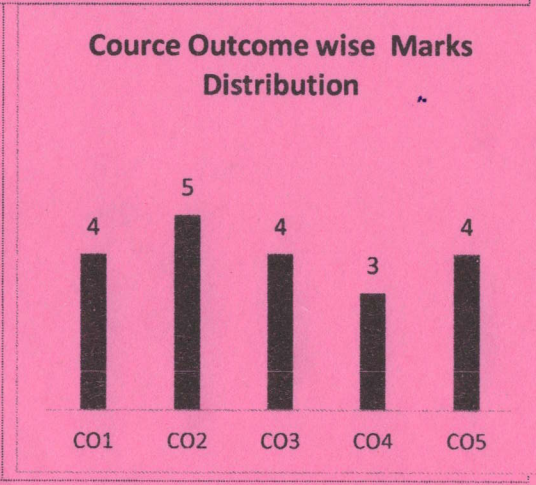
Q. No.	QUESTIONS	Marks	COs	KL
8	Explain tree isomorphism with diagrams.	10	CO4	K4
9	Explain mathematical induction and strong induction. Prove a suitable identity using both methods.	10	CO3	K3
10	Prove that $f(x) = 2x - 3$is bijective. For $f(x) = 2x + 1, g(x) = 4x - 7$, soive (i) $f(x) = g(x)$, (ii) $f(x) < g(x)$.	10	CO2	K2
11	Explain Cartesian product, properties, and compute $X \times Y \times Z$for sample sets.	10	CO1	K1
12	Two fair six-sided dice are rolled. Let the outcome be represented as an ordered pair (X, Y), where $X$is the result on the first die and $Y$is the result on the second die. I. Find the probability that the sum of the two dice is greater than 8. II. Find the probability that both dice show even numbers. III. Find the probability that at least one die shows a 6. IV. Given that the sum of the dice is 9, find the probability that the first die shows a 4. V. Find the probability that the product of the two dice is a multiple of 3.	10	CO5	K3

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

Course Outcomes	CO1	Remember the concept of entrepreneurship, its types, and role in economic development.
	CO2	Analyze business opportunities and apply creativity for idea generation.
	CO3	Create a comprehensive business plan including marketing, financial, and operational strategies.
	CO4	Evaluate various funding options and government support schemes.
	CO5	Apply entrepreneurial competencies with leadership, and decision-making skills.

GRAPHICAL REPRESENTATION





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[29-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Bachelor of Computer Application [Regular / AIDL]**		
Subject Name	**Entrepreneurship Development**	**Session**	**Odd, 2025-26**
Semester	**I**	**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**
- **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 business plan.	02	CO3	K5
ii	Mention one selection technique for project evaluation.	02	CO3	K2
iii	What is the purpose of make in india program.	02	CO4	K3
iv	Define business incubator.	02	CO4	K2
v	What is mean by family business.	02	CO5	K3
vi	State any two cause of startup failure.	02	CO5	K2
vii	List two characteristics of successful entrepreneurs.	02	CO1	K3
viii	What is social entrepreneurship?	02	CO1	K2
ix	State one importance of innovation for entrepreneurs.	02	CO2	K2
x	What do you mean by customer needs?	02	CO2	K3

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

Q. No.	QUESTIONS	Marks	COs	KL
2	What is risk and uncertainty in entrepreneurship? How can they be managed?	05	CO5	K4
3	Explain the importance of work-life balance for entrepreneurs.	05	CO5	K3
4	Define entrepreneurship and explain its importance in economic development.	05	CO1	K6
5	What is a business plan? Explain its main components.	05	CO3	K5
6	Discuss the objectives and benefits of the Startup India initiative.	05	CO4	K2
7	What is a business opportunity? Explain the process of opportunity identification.	05	CO2	K3

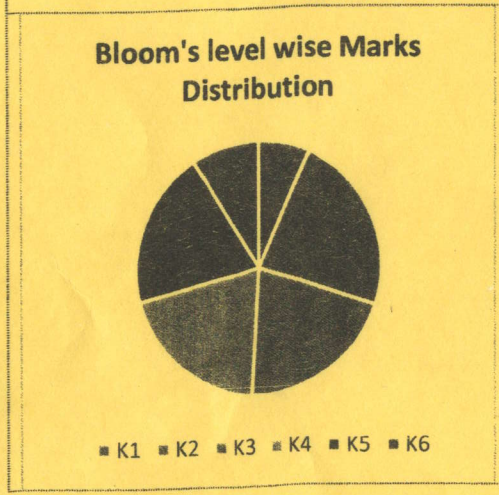
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

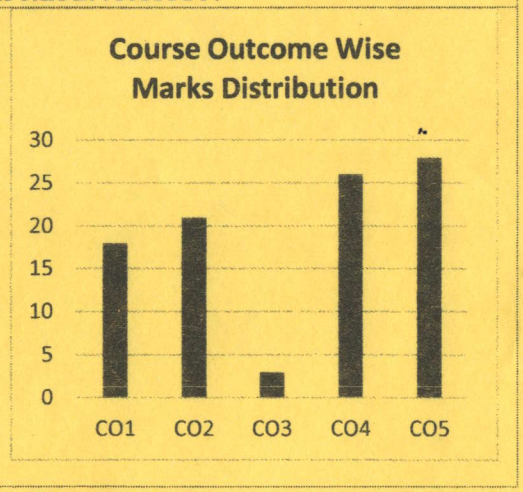
Q. No.	QUESTIONS	Marks	COs	KL
8	Compare and contrast the characteristics and roles of entrepreneurs and intrapreneurs, with suitable case studies.	10	CO1	K3
9	Discuss in detail the importance of entrepreneurship in shaping the economic development of a nation. Provide relevant examples.	10	CO1	K6
10	Discuss hoe excel supports enterprise planning.	10	CO2	K3
11	Explain market segmentation and its importance for entrepreneurs.	10	CO2	K3
12	Describe various sources of startup financing, including venture capital and angel investors.	10	CO3	K5

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

Course Outcomes	CO1	Build the students' confidence and enhance competitiveness by projecting a strong personality.
	CO2	Improve their listening & speaking abilities.
	CO3	Write error-free content while improving vocabulary & grammar.
	CO4	Deliver effective oral business presentations.
	CO5	Demonstrate verbal and non-verbal communication abilities through presentations.

GRAPHICAL REPRESENTATION





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[27-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Bachelor of Computer Application [AIDL / Cyber Security]**		
Subject Name	**Business Communication**	**Session**	**Odd, 2025-26**
Semester	**I**	**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** • **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	State one example of a physical barrier in communication.	02	CO1	K1
ii	What is informal communication?	02	CO5	K2
iii	Mention any one type of business report.	02	CO1	K5
iv	What is the ideal length of a précis compared to the original passage?	02	CO3	K1
v	What is a formal telephonic conversation?	02	CO2	K5
vi	State any one principle of effective oral communication.	02	CO1	K4
vii	What is meant by group discussion (GD)?	02	CO4	K6
viii	Mention one skill required for effective participation in a group discussion.	02	CO3	K6
ix	Mention one commonly used safety symbol.	02	CO2	K3
x	What are helpful expressions in communication?	02	CO1	K6

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Describe the communication process or cycle with a neat explanation of each step.	05	CO5	K4
3	What are the common barriers to communication? Suggest practical ways to overcome these barriers.	05	CO2	K2
4	What are the key elements of basic communication skills? Explain with examples.	05	CO4	K6
5	What makes an oral business presentation effective? Explain important strategies and techniques.	05	CO1	K4
6	What is a group discussion? Write any four benefits of participating in a group discussion.	05	CO2	K6
7	Define speaking skills. Mention any four components needed to develop effective speaking skills.	05	CO3	K3

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

Q. No.	QUESTIONS	Marks	COs	KL
8	Discuss in detail the essential communication etiquette required during a group discussion. Explain the importance of body language, listening skills, language techniques, and respectful interaction.	10	CO5	K5
9	Describe in detail the role of body language in communication. Explain how posture, eye contact, gestures, and facial expressions support verbal communication.	10	CO4	K1
10	Analyze the barriers to entrepreneurship in the Indian context. How can these barriers be overcome through policy and education?	10	CO4	K4
11	Explain the concept of business opportunity identification. Discuss the steps involved in evaluating business opportunities.	10	CO5	K6
12	Discuss the objectives and benefits of Startup India, Make in India, and Digital India initiatives.	10	CO5	K3

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Program	**Bachelor of Computer Application [Regular / AIDL / CS]**		
Subject Name	**Environmental Studies**	**Session**	**Odd, 2025-26**
Semester	**I**	**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** • **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 Mark from Q1-i to v) – 05 Marks

Q. N 1	QUESTIONS	Marks	COs	KL
i	What is an ecosystem?	01	CO1	K1
ii	Define a food chain.	01	CO1	K1
iii	What is meant by sustainable development?	01	CO2	K1
iv	Name any one major global environmental issue.	01	CO3	K1
v	Write any one effect of population growth on the environment.	01	CO3	K2

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

Q. No.	QUESTIONS	Marks	COs	KL
2	What is an ecosystem? Briefly mention its two main structural components.	02	CO1	K2
3	What is an ecological pyramid? Name any two types of ecological pyramids.	02	CO1	K1
4	State any two problems caused by rapid population growth.	02	CO3	K2

5	What is the Family Welfare Program? Mention its three objectives.	02	CO5	K1
6	What are resources? Give one example of a natural resource.	02	CO2	K1
7	What is water pollution? Mention any one major source of water pollution	02	CO2	K2

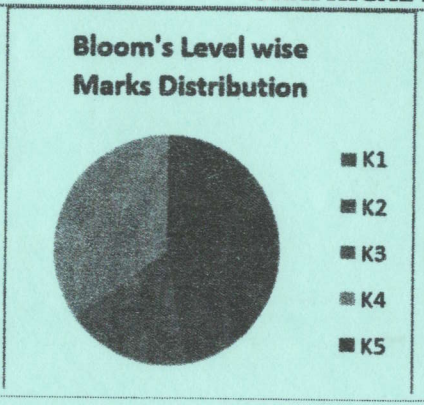
Section C (Answer any TWO out of FOUR) – 20 Marks
(Each question Carry 10 Marks)

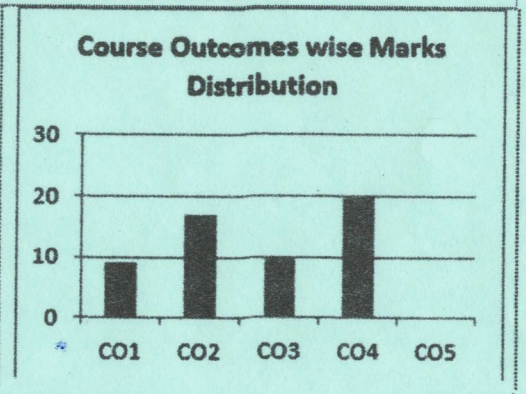
Q. No.	QUESTIONS	Marks	COs	KL
8	Define biodiversity and explain its major issues.	10	CO3	K2
9	Explain the problem of population growth and population explosion. Discuss their causes, effects on the environment, and measures to control them.	10	CO3	K4
10	Explain soil degradation and land degradation in detail. Discuss their causes, effects, and control measures.	10	CO2	K4
11	Discuss the role of Information Technology (IT) in environmental monitoring.	10	CO5	K3

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

Course Outcomes	CO1	Concept clarification about the components of environment and their inter relatedness.
	CO2	Understanding of all the resources available and their origin and the ways to conserve them for sustainable future.
	CO3	To evaluate the environment and various species present and their importance and ways to conserve biodiversity.
	CO4	To construct and evaluate ways of managing solid waste and safe disposal techniques.
	CO5	To understand various measures undertaken by Govt. and Laws related to protection of environment.

GRAPHICAL REPRESENTATION

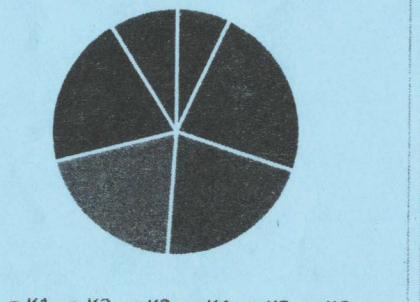


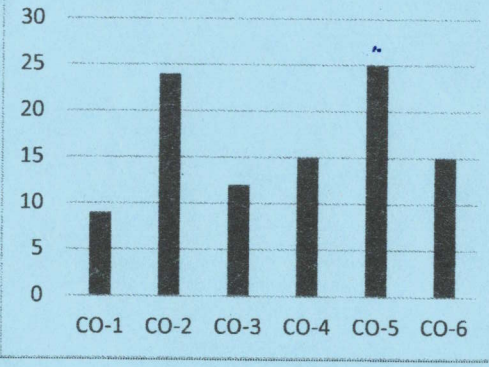


CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Understand the fundamentals of Computer Architecture.
	CO2	Learn about components and subsystems of Computer Architecture.
	CO3	Explore real-world applications of different computer Architecture
	CO4	Analyse case studies and real-world examples of Computer Architecture.
	CO5	Analyse the behaviour of memory hierarchy and cache memory

GRAPHICAL REPRESENTATION





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[19-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Bachelor of Computer Application [Regular / AIDL]**		
Subject Name	**Computer Architecture**	**Session**	**Odd, 2025-26**
Semester	**I**	**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** • **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 is instruction pipelining?	02	CO1	K1
ii	What is a data bus? State its main function.	02	CO4	K1
iii	Why are hexadecimal numbers used instead of binary in computer systems?	02	CO2	K1
iv	What is meant by the output of a combinational circuit being time-independent?	02	CO3	K2
v	What is interrupt-driven I/O?	02	CO1	K4
vi	What is meant by a cache hit?	02	CO4	K3
vii	What is cluster computing?	02	CO2	K1
viii	Name two main types of storage systems in a computer.	02	CO3	K2
ix	Name one key metric used to measure the performance of a storage system.	02	CO5	K1
x	What is a benchmark in computer systems?	02	CO1	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	What is the process for converting a hexadecimal number to octal? Describe the Steps involved.	05	CO1	K2
3	Define the basic operations in Boolean algebra.	05	CO4	K1
4	What distinguishes sequential circuits from combinational circuits?	05	CO2	K2
5	What is the primary function of the Control Unit in a CPU?	05	CO3	K1
6	What is instruction pipelining, and how does it improve CPU throughput?	05	CO5	K2
7	What are the main types of storage systems used in computer architecture?	05	CO1	K2

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

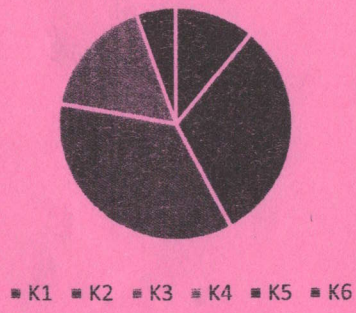
Q. No.	QUESTIONS	Marks	COs	KL
8	How would you convert the binary number 1101010 to decimal? Explain the conversion process and state the final decimal value.	10	CO2	K2
9	Describe the differences between volatile and non-volatile memory. Provide examples of each.	10	CO3	K3
10	Describe the structure of a traditional hard disk drive (HDD). What are its key Components?	10	CO5	K1
11	What are I/O devices, and how do they interact with the CPU? Explain the role of I/O Interfaces.	10	CO1	K4
12	How does flash memory work, and what types of flash memory are commonly used in SSDs? Explain in detail.	10	CO1	K2

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

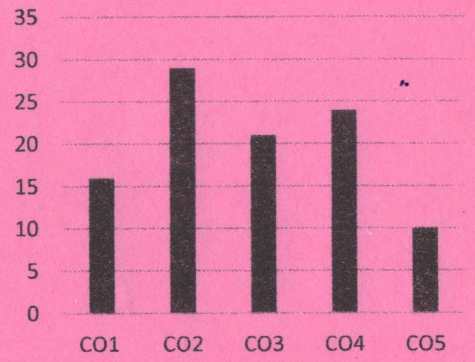
Course Outcomes	CO1	Understand the process of problem solving and algorithm development.
	CO2	Develop flowcharts and algorithms for computational problems.
	CO3	Apply C programming concepts for real-time problem solving.
	CO4	Write, debug, and execute modular and efficient C programs.
	CO5	Analyse program logic and implement memory-efficient solutions.

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Course Outcomewise Marks Distribution



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[16-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	Bachelor of Computer Application [Regular / AIDL / CS]		
Subject Name	Problem Solving Using C	Session	Odd, 2025-26
Semester	I	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**
- **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 do you mean by Pointer?	02	CO3	K2
ii	What are pre-processor directives?	02	CO1	K1
iii	What are operators? Give an example.	02	CO1	K1
iv	What do you mean by Function?	02	CO2	K2
v	Write down the purpose of using pseudo code in C.	02	CO1	K1
vi	What do you mean by dynamic memory allocation?	02	CO3	K2
vii	What is file handling?	02	CO4	K3
viii	What is a union?	02	CO4	K1
ix	Define 2D array.	02	CO3	K2
x	What is recursion?	02	CO2	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain the structure of a C program with an example.	05	CO1	K2
3	Differentiate between constants, variables, and keywords with examples.	05	CO1	K2
4	Discuss file operations (open, read, write, delete).	05	CO4	K3
5	Explain various looping statements in C with syntax and examples	05	CO2	K3
6	Differentiate between structure and union with memory diagrams.	05	CO4	K4
7	Write a Program in C to calculate the factorial of a given integer by using recursive functions.	05	CO3	K5

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

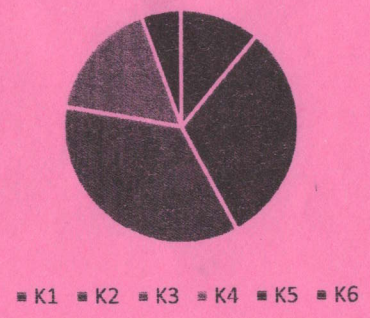
Q. No.	QUESTIONS	Marks	COs	KL
8	Explain string handling in C. Discuss any four string functions with examples.	10	CO3	K3
9	Explain the program development life cycle and tools used in C programming.	10	CO5	K2
10	Explain file management with example. Write a program in C to read and write in a file. Explain the functionality of fgets() and fputs().	10	CO4	K3
11	Write a program using switch-case to perform addition, subtraction, multiplication, and division.	10	CO2	K2
12	Explain call by value and call by reference. Write programs for both methods to swap two numbers and compare memory usage, execution, and results.	10	CO2	K4

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

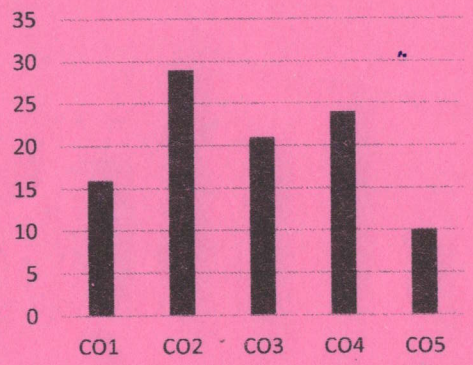
Course Outcomes	CO1	Understand the process of problem solving and algorithm development.
	CO2	Develop flowcharts and algorithms for computational problems.
	CO3	Apply C programming concepts for real-time problem solving.
	CO4	Write, debug, and execute modular and efficient C programs.
	CO5	Analyse program logic and implement memory-efficient solutions.

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Course Outcomewise Marks Distribution



ARKA JAIN University
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NAAC GRADE A ACCREDITED UNIVERSITY

[16-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	Bachelor of Computer Application [Regular / AIDL / CS]		
Subject Name	Problem Solving Using C	Session	Odd, 2025-26
Semester	I	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**
- **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 do you mean by Pointer?	02	CO3	K2
ii	What are pre-processor directives?	02	CO1	K1
iii	What are operators? Give an example.	02	CO1	K1
iv	What do you mean by Function?	02	CO2	K2
v	Write down the purpose of using pseudo code in C.	02	CO1	K1
vi	What do you mean by dynamic memory allocation?	02	CO3	K2
vii	What is file handling?	02	CO4	K3
viii	What is a union?	02	CO4	K1
ix	Define 2D array.	02	CO3	K2
x	What is recursion?	02	CO2	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain the structure of a C program with an example.	05	CO1	K2
3	Differentiate between constants, variables, and keywords with examples.	05	CO1	K2
4	Discuss file operations (open, read, write, delete).	05	CO4	K3
5	Explain various looping statements in C with syntax and examples	05	CO2	K3
6	Differentiate between structure and union with memory diagrams.	05	CO4	K4
7	Write a Program in C to calculate the factorial of a given integer by using recursive functions.	05	CO3	K5

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

Q. No.	QUESTIONS	Marks	COs	KL
8	Explain string handling in C. Discuss any four string functions with examples.	10	CO3	K3
9	Explain the program development life cycle and tools used in C programming.	10	CO5	K2
10	Explain file management with example. Write a program in C to read and write in a file. Explain the functionality of fgets() and fputs().	10	CO4	K3
11	Write a program using switch-case to perform addition, subtraction, multiplication, and division.	10	CO2	K2
12	Explain call by value and call by reference. Write programs for both methods to swap two numbers and compare memory usage, execution, and results.	10	CO2	K4

JGI	ARKA JAIN University Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	[21-01-2026] END SEM EXAMINATION School of Engineering & IT.

Program	Bachelor of Computer Application [Regular / AIDL / CS]		
Subject Name	Environmental Studies	Session	Odd, 2025-26
Semester	I	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 • 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 Mark from Q1-i to v) – 05 Marks

Q. N 1	QUESTIONS	Marks	COs	KL
i	What is an ecosystem?	01	CO1	K1
ii	Define a food chain.	01	CO1	K1
iii	What is meant by sustainable development?	01	CO2	K1
iv	Name any one major global environmental issue.	01	CO3	K1
v	Write any one effect of population growth on the environment.	01	CO3	K2

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

Q. No.	QUESTIONS	Marks	COs	KL
2	What is an ecosystem? Briefly mention its two main structural components.	02	CO1	K2
3	What is an ecological pyramid? Name any two types of ecological pyramids.	02	CO1	K1
4	State any two problems caused by rapid population growth.	02	CO3	K2

5	What is the Family Welfare Program? Mention its three objectives.	02	CO5	K1
6	What are resources? Give one example of a natural resource.	02	CO2	K1
7	What is water pollution? Mention any one major source of water pollution	02	CO2	K2

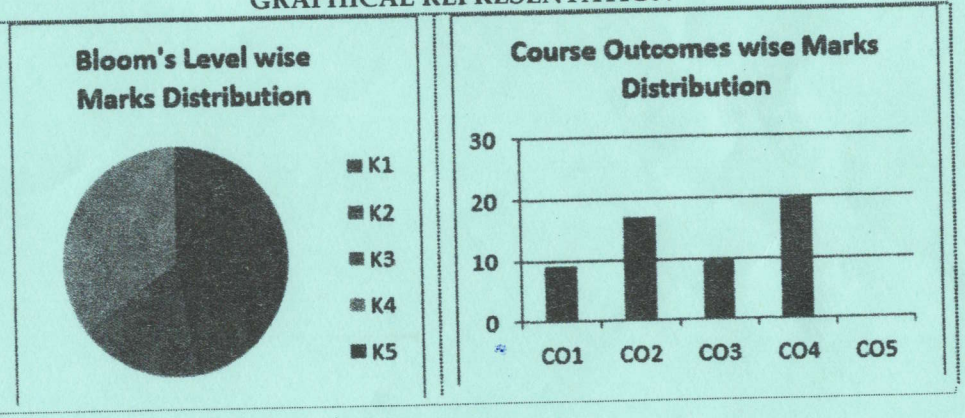
Section C (Answer any TWO out of FOUR) – 20 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Define biodiversity and explain its major issues.	10	CO3	K2
9	Explain the problem of population growth and population explosion. Discuss their causes, effects on the environment, and measures to control them.	10	CO3	K4
10	Explain soil degradation and land degradation in detail. Discuss their causes, effects, and control measures.	10	CO2	K4
11	Discuss the role of Information Technology (IT) in environmental monitoring.	10	CO5	K3

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

Course Outcomes	CO1	Concept clarification about the components of environment and their inter relatedness.
	CO2	Understanding of all the resources available and their origin and the ways to conserve them for sustainable future.
	CO3	To evaluate the environment and various species present and their importance and ways to conserve biodiversity.
	CO4	To construct and evaluate ways of managing solid waste and safe disposal techniques.
	CO5	To understand various measures undertaken by Govt. and Laws related to protection of environment.

GRAPHICAL REPRESENTATION

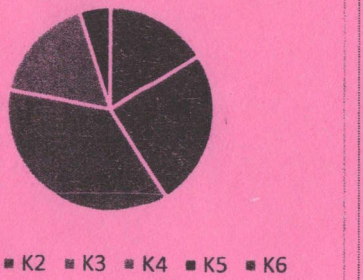


CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

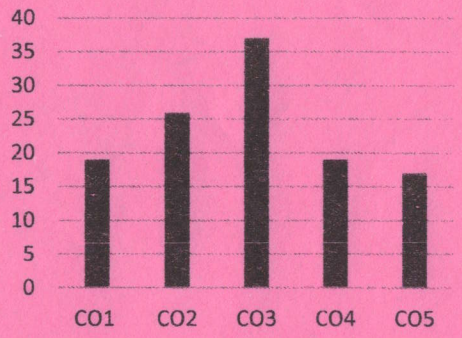
Course Outcomes	CO1	Apply the principles of logic, proofs, and set theory to solve discrete mathematical problems.
	CO2	Remember and use relations, functions, and recurrence relations in computational applications.
	CO3	Apply combinatorial techniques and understand the basics of counting principles.
	CO4	Analyze and model problems using graphs and trees.
	CO5	Develop mathematical reasoning and discrete structures in computer science.

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Course Outcomewise Marks Distribution



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NAAC GRADE A
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[31-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Bachelor of Computer Application [Regular / AIDL / Cyber Security]**		
Subject Name	**Discrete Mathematics**	**Session**	**Odd, 2025-26**
Semester	**I**	**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**
- **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	If $U = \{1,2,3,4,5\}$ and $A = \{2,5\}$, then $A' =$	02	CO1	K1
ii	If A={x | x is odd}, B={1,2,3}, then A∩B =?	02	CO2	K2
iii	When is a relation R on a set called reflexive?	02	CO2	K1
iv	Find the domain of the relation {(1,3), (2,5), (6,8)}.	02	CO2	K2
v	Define sequence with an example.	02	CO4	K2
vi	In strong induction, for which values are the statement assumed to be true?	02	CO4	K2
vii	What is meant by graph isomorphism?	02	CO5	K4
viii	Explain shortest path between two vertices.	02	CO1	K2
ix	What is the probability of obtaining an odd number when a fair die is rolled?	02	CO3	K3
x	In how many ways can 3 objects be selected from a set of 10 objects?	02	CO5	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	If $A = \{1,3,4,5,6,7\}$, B =even numbers, $C = \{2,3,4,5,6\}$, find $(A \cap B) - C$	05	CO1	K2
3	Test whether R on A={1,2,3,4} is reflexive: $R = \{(1,1),(2,2),(1,3),(2,4),(3,3),(3,4),(4,4)\}$.	05	CO2	K3
4	What is Bayes' Theorem? Explain.	05	CO2	K4
5	Define recursive sequences and solve using iteration: $a_n = 2a_{n-1} + 3, a_0 = 1$.	05	CO3	K3
6	Draw tree diagram of two-dice experiment and list the sample space.	05	CO4	K5
7	Compute the probability that the first ball drawn is red and the second ball drawn is blue from a bag containing 7 blue, 5 yellow, and 3 red balls.	05	CO5	K3

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

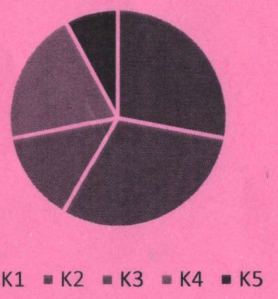
Q. No.	QUESTIONS	Marks	COs	KL
8	Explain tree isomorphism with diagrams.	10	CO4	K4
9	Explain mathematical induction and strong induction. Prove a suitable identity using both methods.	10	CO3	K3
10	Prove that $f(x) = 2x - 3$is bijective. For $f(x) = 2x + 1, g(x) = 4x - 7$, solve (i) $f(x) = g(x)$, (ii) $f(x) < g(x)$.	10	CO2	K2
11	Explain Cartesian product, properties, and compute $X \times Y \times Z$for sample sets.	10	CO1	K1
12	Two fair six-sided dice are rolled. Let the outcome be represented as an ordered pair (X, Y), where $X$is the result on the first die and $Y$is the result on the second die. I. Find the probability that the sum of the two dice is greater than 8. II. Find the probability that both dice show even numbers. III. Find the probability that at least one die shows a 6. IV. Given that the sum of the dice is 9, find the probability that the first die shows a 4. V. Find the probability that the product of the two dice is a multiple of 3.	10	CO5	K3

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

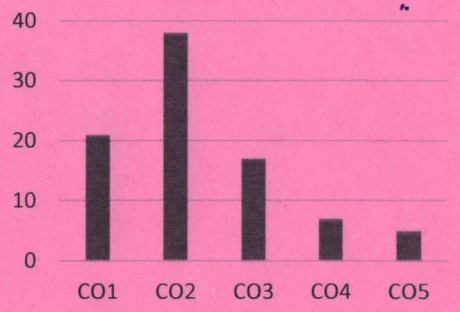
Course Outcomes	CO1	Understand the fundamentals of operating system security principles and concepts.
	CO2	Identify common security threats and vulnerabilities in operating systems.
	CO3	Learn techniques for securing user authentication and access control.
	CO4	Develop skills in malware detection, analysis, and mitigation.
	CO5	Implement system hardening techniques to enhance security posture.

GRAPHICAL REPRESENTATION

Bloom's Level Wise Marks Distribution



Course Outcome Wise Marks Distribution



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[29-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Bachelor of Computer Application [Cyber Security]**		
Subject Name	**Operating System for Security Perspective**	**Session**	**Odd, 2025-26**
Semester	**I**	**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** • **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	Write down the use of Virtual Memory.	02	CO1	K1
ii	Which architecture uses multiple independent instruction and data streams?	02	CO1	K2
iii	What do you mean Unix Operating System?	02	CO2	K2
iv	Define Platform-agnostic security mechanism.	02	CO2	K1
v	Define Intrusion Detection and Prevention System (IDPS).	02	CO4	K1
vi	Write down the use of Active Directory.	02	CO2	K2
vii	Which Linux command is used to monitor real-time system processes?	02	CO2	K1
viii	Which feature encrypts the entire disk in Windows?	02	CO3	K3
ix	Which tool is used for configuring Windows firewall rules?	02	CO4	K2
x	Which layer interacts directly with hardware?	02	CO1	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Describe the purpose of User Account Control (UAC) and how it enhances system security.	05	CO2	K2
3	Compare SISD, SIMD, MISD, and MIMD architectures with diagrams.	05	CO1	K1
4	Write the uses of 5 essential Linux commands and 5 Linux networking commands.	05	CO4	K1, K2
5	Distinguish between Intrusion Detection System (IDS) and Intrusion Prevention System (IPS). Explain its basic purpose in network security.	05	CO3	K2, K3
6	Explain the difference between Local Security Policy and Group Policy Editor.	05	CO2	K1
7	Analyze how improper user privilege management can lead to security breaches. Provide real-world examples.	05	CO2	K4

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

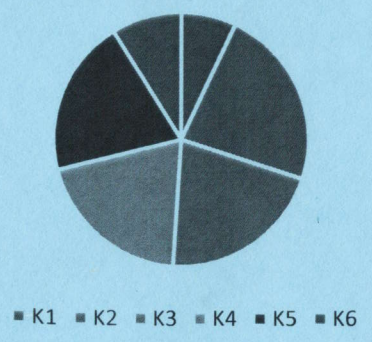
Q. No.	QUESTIONS	Marks	COs	KL
8	Explain the working principle of Round Robin scheduling with an example.	10	CO1	K1, K2
9	Explain the architecture and security model of Windows OS, Linux OS, and UNIX OS. Compare them regarding access control, permissions, and malware resistance.	10	CO2	K2
10	Explain the step-by-step configuration of Active Directory Domain Services (ADDS) and evaluate its importance in enterprise security.	10	CO3	K5
11	Analyze Windows Firewall architecture. Illustrate the flow of inbound and outbound traffic filtering and evaluate its effectiveness	10	CO2	K4
12	Explain secure communication protocols such as SSL and TLS and their role in securing network communications.	10	CO5	K3, K4

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

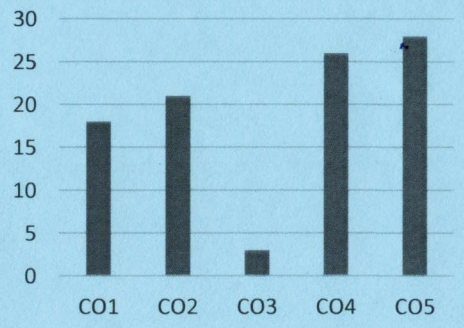
Course Outcomes	CO1	Build the students' confidence and enhance competitiveness by projecting a strong personality.
	CO2	Improve their listening & speaking abilities.
	CO3	Write error-free content while improving vocabulary & grammar.
	CO4	Deliver effective oral business presentations.
	CO5	Demonstrate verbal and non-verbal communication abilities through presentations.

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Course Outcome Wise Marks Distribution



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[27-01-2026]
END SEM EXAMINATION
School of Engineering & IT

Program	**Bachelor of Computer Application [Regular / AIDL / Cyber Security]**		
Subject Name	**Business Communication**	**Session**	**Odd, 2025-26**
Semester	**I**	**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** • **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	State one example of a physical barrier in communication.	02	CO1	K1
ii	What is informal communication?	02	CO5	K2
iii	Mention any one type of business report.	02	CO1	K5
iv	What is the ideal length of a précis compared to the original passage?	02	CO3	K1
v	What is a formal telephonic conversation?	02	CO2	K5
vi	State any one principle of effective oral communication.	02	CO1	K4
vii	What is meant by group discussion (GD)?	02	CO4	K6
viii	Mention one skill required for effective participation in a group discussion.	02	CO3	K6
ix	Mention one commonly used safety symbol.	02	CO2	K3
x	What are helpful expressions in communication?	02	CO1	K6

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Describe the communication process or cycle with a neat explanation of each step.	05	CO5	K4
3	What are the common barriers to communication? Suggest practical ways to overcome these barriers.	05	CO2	K2
4	What are the key elements of basic communication skills? Explain with examples.	05	CO4	K6
5	What makes an oral business presentation effective? Explain important strategies and techniques.	05	CO1	K4
6	What is a group discussion? Write any four benefits of participating in a group discussion.	05	CO2	K6
7	Define speaking skills. Mention any four components needed to develop effective speaking skills.	05	CO3	K3

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

Q. No.	QUESTIONS	Marks	COs	KL
8	Discuss in detail the essential communication etiquette required during a group discussion. Explain the importance of body language, listening skills, language techniques, and respectful interaction.	10	CO5	K5
9	Describe in detail the role of body language in communication. Explain how posture, eye contact, gestures, and facial expressions support verbal communication.	10	CO4	K1
10	Analyze the barriers to entrepreneurship in the Indian context. How can these barriers be overcome through policy and education?	10	CO4	K4
11	Explain the concept of business opportunity identification. Discuss the steps involved in evaluating business opportunities.	10	CO5	K6
12	Discuss the objectives and benefits of Startup India, Make in India, and Digital India initiatives.	10	CO5	K3