

JGI	ARKA JAIN University Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	[21-06-2025] END SEM EXAMINATION School of Engineering & IT
Program	Bachelor of Computer Application (AIDL)		
Subject Name	Operating System	Session	Even, 2024-2025
Semester	II	Year	June, 2025
- 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 come under <u>Unfair Means</u> and will Result in the <u>Cancellation of the Paper(s)</u>.			
Time: 3 Hour Max. Marks : 70	Knowledge Level (KL)	K1 : Remembering	K5 : Evaluating
		K2 : Understanding	K6 : Creating

Q.N	Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)			Marks	COs	KL
1	QUESTIONS					
i	What are system calls in an operating system?			02	CO2	K2
ii	Mention two key differences between Linux and Windows memory management.			02	CO1	K1
iii	Define I/O virtualization and explain its purpose.			02	CO2	K4
iv	What is the difference between multiprocessor and multicomputer systems?			02	CO4	K2
v	Define a file and a directory.			02	CO3	K2
vi	Write the role of the ostrich algorithm in deadlock handling.			02	CO5	K4
vii	What is virtual memory?			02	CO6	K2
viii	What is the difference between deadlock prevention and deadlock avoidance?			02	CO5	K1
ix	Name any two file systems used in operating systems.			02	CO4	K1
x	What is the role of a hypervisor in a virtualized environment?			02	CO5	K4

CO- Course Outcomes,		KL- Knowledge Level,		PO - Program Outcome	
Course Outcomes	CO1	To acquire the fundamental knowledge of the operating system architecture and components			
	CO2	To know the various operations performed by the operating system			
	CO3	To Know about the Types of operating systems and differences among them			
	CO4	To Know about the Processes, threads, and the differences between the two			
	CO5	To Know about the Interrupts, synchronization, waiting, and atomic behaviour			
	CO6	To Know about the Virtual memory, paging, and memory allocation Caching principles and quantitative estimation of cache behaviour.			
GRAPHICAL REPRESENTATION					
Bloom's level wise Marks Distribution			Course Outcome wise Marks Distribution		
 ■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6			 CO-1 CO-2 CO-3 CO-4 CO-5 CO-6		

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 internal & external fragmentation? Explain with proper example.	05	CO2	K4
3	Explain Dining Philosophers problem and their solution.	05	CO4	K2
4	What is Semaphores? Explain Binary Semaphore with one example.	05	CO4	K1
5	Explain Dining Philosophers problem and their solution.	05	CO3	K5
6	Discuss various methods for the prevention of deadlocks.	05	CO1	K3
7	Explain the concept of process scheduling. Illustrate the working of the CPU scheduler with the help of a neat diagram.	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	Given below are the arrival and burst times of four processes P1, P2, P3 and P4. Draw the Gantt Chart using SJF pre-emptive and non-preemptive scheduling and calculate the average waiting time and compare. Process Arrival Time Burst Time P1 0.0 7 P2 2.0 4 P3 4.0 1 P4 5.0 4	10	CO6	K5
9	What is Deadlock? Discuss the necessary conditions that cause deadlock situation to occur.	10	CO4	K2
10	Consider the page references 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 3 with 3 & 4-page frame. Find number of page fault using Optimal Page Replacement Algorithm & Compare it.	10	CO6	K5
11	Explain the Operating System from the perspective of a system designer. Highlight the goals, structure, and abstraction levels involved in OS design.	10	CO3	K2
12	Distinguish between Type 1 (Bare-Metal) and Type 2 (Hosted) hypervisors with examples. Provide advantages and disadvantages of each type.	10	CO5	K4

	ARKA JAIN University Jharkhand				[24-06-2025] END SEM EXAMINATION School of Engineering & IT
	Program	Bachelor of Computer Application (AIDL)			
	Subject Name	Programming with Java			
Semester	II	Session	Even, 2024-2025		
		Year	June, 2025		
Time: 3 Hour Max. Marks : 70	• Start writing from 2nd page onwards; <u>don't Write on the 1st Page Backside</u> • Answer all Questions of Section A (Compulsory) • Answer Any <u>Four</u> out of Six of Section B • Answer Any <u>Three</u> out of Five of Section C • Possession of <u>Mobile Phone</u> or any kind of <u>Written Material</u>, <u>Arguments with the Invigilator or Discussion with Co-Student</u> will comes under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Paper(s)</u>.				
	Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating	
	K2 : Understanding	K4 : Analysing	K6 : Creating		

Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)					
Q. N	QUESTIONS			Marks	COs
1					KL
i	What are the key features of Java? *			02	CO1
					KL1
ii	What is a Java Class File?			02	CO1
					KL1
iii	Write the syntax to create a subclass in Java			02	CO2
					KL1
iv	What is the use of the switch case statement?			02	CO2
					KL2
v	Differentiate between JDK and JRE.			02	CO1
					KL1
vi	Name two types of array.			02	CO3
					KL1
vii	Define abstraction and encapsulation.			02	CO3
					KL5
viii	What is the use of the 'super' keyword?			02	CO2
					KL4
ix	What is a multithread in Java?			02	CO4
					KL3
x	Name two AWT Components.			02	CO4
					KL1

Section B (Answer any FOUR out of SIX) – 20 Marks (Each question Carry 05 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
2	Define polymorphism in java. Write a program that illustrate function overloading.	05	CO1	KL1
3	Describe how a for-each loop works in Java and when it is preferred over a regular for loop.	05	CO1	KL2
4	Write a method that checks whether two strings are anagrams of each other.	05	CO4	KL3
5	What are the differences between AWT and Swing components?	05	CO4	KL5
6	What is the use of this keyword in Java classes? Give an example.	05	CO3	KL2
7	What is the difference between throw and throws in Java? Explain with an example.	05	CO4	KL6
Section C (Answer any THREE out of FIVE) – 30 Marks (Each question Carry 10 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
8	Define thread and its lifecycle with a neat diagram. Explain with a code snippet.	10	CO4	KL4
9	You are tasked with designing a student information system for a university. Each student has the following attributes: student ID, name, GPA, enrollment status (active/inactive), and date of birth. Create a Java class named Student with appropriate data types for each field. Discuss why each data type was chosen, focusing on the difference between primitive types and reference types in Java. Also, explain how immutability and encapsulation should be considered while designing such a class.	10	CO2	KL2
10	What is inheritance in Java? Explain different types and their purpose with a simple example.	10	CO1	KL3
11	You are developing a payment system that supports multiple payment methods like CreditCard, DebitCard, and PayPal. Each payment method processes payments differently but shares common operations like authorize(), capture(), and refund(). Design a Java interface Payment with these methods and implement classes for each payment method. Explain how interfaces facilitate multiple inheritance and ensure consistent behavior across different payment types.	10	CO2	KL6

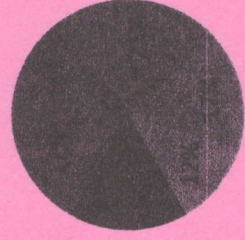
12	What is an interface in Java? How is it different from an abstract class? Why do we use interface in java?	10	CO3	KL5
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CO- Course Outcomes, KL- Knowledge Level, PO – Program Outcome

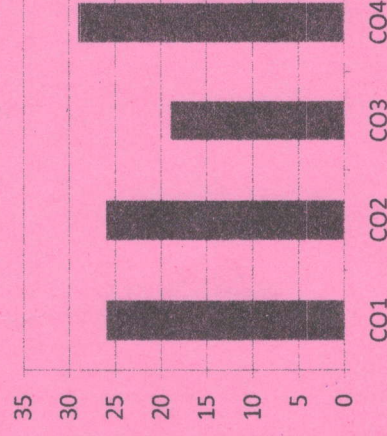
Course Outcomes	CO1	Analyze the logic of a given problem.	•
	CO2	Use branching control statements and iterative control statements.	
	CO3	Achieving Multiple inheritance using interface.	
	CO4	Applet and AWT to design application.	

GRAPHICAL REPRESENTATION

Bloom's Level wise Marks Distribution



Course Outcome wise Marks Distribution



 ARKA JAIN University Jharkhand		NAAC GRADE A ACCREDITED UNIVERSITY	[30-06-2025] END SEM EXAMINATION School of Engineering & IT
Program	Bachelor of Computer Application (AIDL)		
Subject Name	Cloud Fundamentals	Session	Even, 2024-2025
Semester	II	Year	June, 2025
• Start writing from 2nd page onwards; don't Write on the 1st Page Backside • Answer all Questions of Section A (Compulsory) • Answer Any Four out of Six of Section B • Answer Any Three out of Five of Section C • Possession of <u>Mobile Phone</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussion with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Paper(s)</u>.			
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating
Time: 3 Hour Max. Marks : 70			

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)				
Q. N	QUESTIONS	Marks	COs	KL
i	What do you understand about the term "containerization"?	02	CO2	K1
ii	Define a container registry. Give one example of a commonly used registry.	02	CO5	K1
iii	What is meant by a "document" in IBM Cloudant?	02	CO2	K1
iv	Define a Relational Database Management System (RDBMS).	02	CO1	K1
v	What is cryptography in the context of cloud data protection?	02	CO3	K1
vi	What is the role of Identity and Access Management (IAM) in cloud computing?	02	CO4	K3
vii	Name four commonly used HTTP methods in RESTful APIs.	02	CO3	K1
viii	What is JSON and where is it used?	02	CO3	K1
ix	Mention any two benefits of using the public cloud model.	02	CO2	K1
x	Explain the term "cloud delivery model" in simple terms.	02	CO2	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 private, public, and hybrid cloud models. Discuss their advantages and common applications.	05	CO1	K4
3	Compare the HTTP methods GET, POST, PUT, and DELETE using suitable REST API examples.	05	CO3	K5
4	Explain the concept of the Shared Responsibility Model in cloud computing. How are responsibilities divided between provider and customer?	05	CO6	K2
5	Analyze the key features of IBM Cloudant and explain how it is used in real-world applications.	05	CO2	K3
6	Compare key-value and document-oriented NoSQL databases with examples.	05	CQ1	K5
7	Distinguish between containers and virtual machines. Give examples to support your answer.	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 complete process of creating a custom Docker image for a Node.js application and pushing it to Docker Hub.	10	CO5	K2
9	Using REST APIs, demonstrate the following operations with examples: - Create a database named "studentsData" - Insert a document with fields: name, roll_no, and department - Retrieve the inserted document - Delete the document	10	CO5	K6
10	Define cloud workloads. Explain different types of workloads with examples.	10	CO6	K3
11	Evaluate the importance of Postman in API development and testing. Explain the process with a working example.	10	CO4	K5
12	Discuss how cloud computing addresses the limitations of traditional IT infrastructure. Provide a comparative explanation with suitable examples.	10	CO3	K4

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

CO1	Understand cloud computing fundamentals and IBM Cloud infrastructure.
CO2	Demonstrate practical use of IBM Cloud services and compute options
CO3	Analyse IBM Cloud architecture with a focus on security and workload management.
CO4	Apply IBM Cloud data services and APIs in application development.
CO5	Develop cloud-native applications using IBM Cloud DevOps tools and Node-RED.
CO6	Evaluate future IT trends and strategize solutions using IBM Cloud.

Bloom's level wise Marks Distribution	
	■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome wise Marks Distribution	
	CO-1 CO-2 CO-3 CO-4 CO-5 CO-6

GRAPHICAL REPRESENTATION

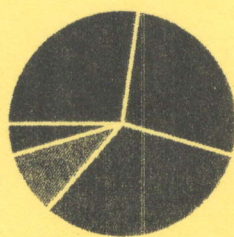
JGI	ARKA JAIN University Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	[26-06-2025] END SEM EXAMINATION School of Engineering & IT
Program	Bachelor of Computer Application (General/AIDL/Cyber Security)		
Subject Name	Object Oriented Programming with C++	Session	Even, 2024-2025
Semester	II	Year	June, 2025
Time: 3 Hour Max. Marks : 70	- Start writing from 2nd page onwards; don't Write on the 1st Page <u>Backside</u> - Answer all Questions of Section A (Compulsory) - Answer Any Four out of Six of Section B - Answer Any Three out of Five of Section C - Possession of Mobile Phone or any kind of Written Material, Arguments with the Invigilator or Discussion with Co-Student will comes under Unfair Means and will Result in the Cancellation of the Paper(s).		
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to x - 20 Marks)				
Q.N	QUESTIONS	Marks	COs	KL
1				
i	Define Object Oriented Programming	02	CO1	K1
ii	What is the difference between data abstraction and data encapsulation?	02	CO2	K2
iii	List any two advantages of Object-Oriented Programming.	02	CO2	K1
iv	Mention any two disadvantages of procedure-oriented programming languages.	02	CO2	K1
v	What do you mean by a class in C++?	02	CO1	K1
vi	Explain the term constructor in brief.	02	CO2	K2
vii	What is function overloading?	02	CO3	K1
viii	What is the use of the <i>this</i> pointer?	02	CO2	K2
ix	Define friend class with a simple example.	02	CO3	K2
x	What is a pure virtual function?	02	CO3	K2

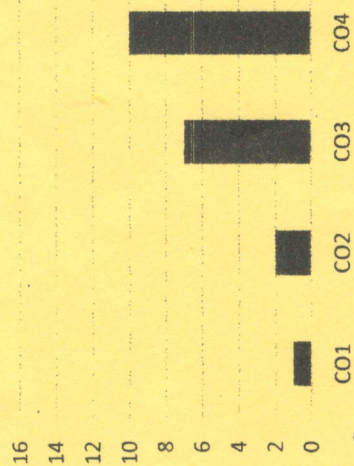
Course Outcomes	CO1	Analyze the logic of a given problem.
	CO2	Use branching control statements and iterative control statements using C++.
	CO3	Demonstrate the concepts of Reusability through the use of functions, Inheritance & Polymorphism.
	CO4	Analyze the problem statement and decide the logic to solve the problem using C++ Programming.

GRAPHICAL REPRESENTATION

Blooms Level Wise Marks Distribution



Course Outcome Wise Marks Distribution



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

(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain inheritance and describe any two types with examples.	05	CO3	K2
3	Write a program in C++ to demonstrate function overloading.	05	CO3	K3
4	Explain the concept of constructor overloading with an example.	05	CO2	K3
5	What are the differences between static and dynamic binding?	05	CO4	K4
6	How is exception handling done in C++ using try, catch, and throw?	05	CO2	K3
7	Describe the advantages of OOP paradigm over procedural programming.	05	CO1	K4

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

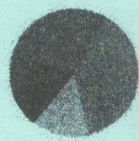
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Write a C++ program to demonstrate multiple inheritance. Explain constructor execution order.	10	CO3	K3
9	Explain operator overloading. Write a C++ program to overload + and == operators.	10	CO3	K3
10	Define virtual functions. Write a program to show runtime polymorphism using base class pointers.	10	CO3	K3
11	What are templates in C++? Write a program using function and class templates.	10	CO3	K6
12	Explain file handling in C++. Write a program to read and write student records using file streams.	10	CO4	K3

CO- Course Outcomes,		KL- Knowledge Level,	PO - Program Outcome
Course Outcomes	CO1	Understand and appreciate descriptive statistics	
	CO2	Understand the concepts of probability and random variable	
	CO3	Interpolation, approximation, and integration of Functions	
	CO4	Initial values problems governed by ordinary differential equations	

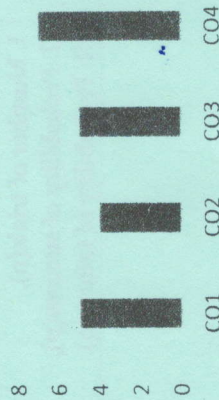
GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



■ k1 ■ k2 ■ k3 ■ k4 ■ k5 ■ k6

Course Outcome wise Marks Distribution



JGI ARKA JAIN University Jharkhand NAAC GRADE A ACCREDITED UNIVERSITY		[02-07-2025] END SEM EXAMINATION School of Engineering & IT	
Program	Bachelor of Computer Application		(General/ AIDL / CS)
Subject Name	Numerical & Statistical Methods		Session Even, 2024-2025
Semester	II		Year June, 2025
	• Start writing from 2nd page onwards; <u>don't Write on the 1st Page Backside</u> • Answer all Questions of Section A (Compulsory) • Answer Any <u>Four</u> out of Six of Section B • Answer Any <u>Three</u> out of Five of Section C • Possession of <u>Mobile Phone</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussion with Co-Student</u> will comes under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Paper(s)</u>.		
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating
Time: 3 Hour			
Max. Marks : 70			

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

Q. N1	QUESTIONS	Marks	COs	KL
i	Apply one iteration of the Newton-Raphson method for $f(x)=x^2-2$ with $x_0=1$.	2	CO4	K1
ii	Apply one iteration of the Bisection Method to find a root of $f(x)=x^3-4$ in $[1, 2]$.	2	CO1	K2
iii	Find the forward difference Δy from the data: $y(0) = 1$, $y(1) = 3$, $y(2) = 7$.	2	CO4	K3
iv	Using Lagrange interpolation, estimate the value of $f(2)$ from: $(1, 2)$, $(3, 10)$.	2	CO3	K2
v	Compute the absolute error and relative error if the exact value is 2.5 and approximate value is 2.45.	2	CO4	K4
vi	Perform one iteration of the Gauss-Seidel method to solve the system: $4x+y=9$ $x+3y=5$ (Use initial guess $x=0, y=0$)	2	CO2	K2
vii	Find the expected value $E(X)$ for a discrete random variable X with: $P(X=1)=0.2$ $P(X=2)=0.3$ $P(X=3)=0.5$	2	CO1	K3
viii	Fit a straight line $y=mx+c$ using least squares method for the data: $(1, 2)$, $(2, 3)$. (Find m and c using the formulas for two points.)	2	CO3	K2

ix	What is the primary use of the least-squares regression technique?	2	CO4	K2												
x	Write the formula for the expected value of a discrete random variable X.	2	CO2	K1												
Section B (Answer any FOUR out of SIX) - 20 Marks (Each question Carry 05 Marks)																
Q. No.	QUESTIONS	Marks	COs	KL												
2	Define truncation error and round-off error. Illustrate with suitable examples.	05	CO1	K2												
3	Explain Gauss-Seidel method for solving a system of linear equations. Apply it for two iterations to solve: $10x+y+z=12, 2x+10y+z=13, x+2y+10z=14$	05	CO4	K3												
4	Use Newton's Forward Interpolation to find the value of y at $x = 2.5$ for the following data: X : 1 2 3 4 Y: 1 4 9 16	05	CO3	K3												
5	Solve the equation $x^3 - x - 1 = 0$ using the Newton-Raphson method for one iteration.	05	CO4	K3												
6	A person measured a length as 3450 cm , where as its actual length is 3445 cm and another length as 145 cm where as its actual length is 140 cm compare their absolute and relative error	05	CO1	K5												
7	On the average, one in 400 items is defective. If the items are packed in the boxes of 100, what is the probability that any given box of items will contain: (i) Defective (ii) Less than 2 defective	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	Solve the following system of equation by Gauss-Jordan method? $10x - 7y + 3z = 6$ $-6x + 8y - z = 5$ $3x + y + 4z = 2$	10	CO4	K3												
9	a) Explain Forward and Backward Differences with their formulas. b) Given the data:	10	CO3	K2												
<table><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>f(x)</td><td>2</td><td>6</td><td>15</td><td>26</td><td>40</td></tr></table>					x	1	2	3	4	5	f(x)	2	6	15	26	40
x	1	2	3	4	5											
f(x)	2	6	15	26	40											

	Construct the forward difference table.			
10	Using Lagrange's formula. Find the polynomial which fits the following data $(-1, 7), (1, 5)$ and $(2, 15)$.	10	CO3	K3
11	Using graphical method solve following LP problems Max $Z = 5x_1 + 3x_2$ Subject to $3x_1 + 5x_2 \leq 15$ $5x_1 + 2x_2 \leq 10$ $x_1, x_2 \geq 0$	10	CO1	K4
12	The mean of binomial distribution is 40 and the Standard Deviation is 6. Calculate - I. Number of trials(n), II. Probability of success(p), III. Probability of failure(q).	10	CO2	K5