ARKA JAIN University, Jharkhand — NAAC GRADE A			[08-05-2025] END SEM EXAMINATION School of Engineering & IT
Program	Computer Science & Engineering	Branch	B. Tech
Subject Name	Open Elective –III Advanced Operating Systems	Session	Even, 2024-2025
Semester	VIII	Year	May, 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 • 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 the primary difference between monolithic Kernel and micro Kernel?	2	CO1	K1
ii	Write any two features of Windows Mobile OS.	2	CO4	K2
iii	How does Hypervisor enable virtualization?	2	CO2	K1
iv	Differentiate between IaaS and SaaS with one example each.	2	CO2	K1
v	What are the main functions of Grid Monitoring in Grid Computing	2	CO1	K3
vi	What is the role of inter-process communication (IPC) in a distributed system?	2	CO2	K3
vii	What is RTOS? Name any one application of RTOS.	2	CO4	K1
viii	Mention two core components of the Android OS architecture.	2	CO5	K2
ix	What is a logical clock, and why is it used in distributed systems	2	CO1	K2
x	Define MOSIX OS and its role in Cluster Computing	2	CO3	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 key components of a Distributed Operating System and how they interact with each other.	05	CO3	K3
3	Explain the basic concept of cloud computing. Discuss its key characteristics and any two major service models with examples.	05	CO3	K4
4	What is a hypervisor? Explain the types of hypervisors and describe the role of KVM in operating system virtualization	05	CO4	K3
5	How have Android, iOS, and Windows Mobile contributed to the evolution of mobile computing?	05	CO2	K2
6	Compare the structure and architecture of Android and iOS operating systems. Highlight key components and their functions.	05	CO3	K4
7	Discuss the importance of scheduling in Real-Time Operating Systems and elaborate on how periodic, aperiodic, and sporadic tasks are scheduled.	05	CO4	K3

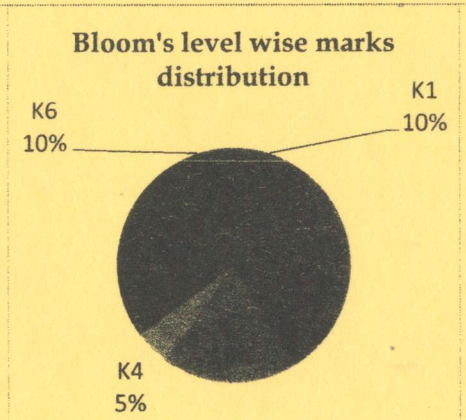
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

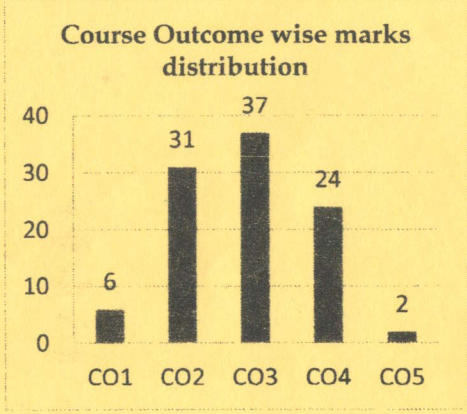
Q. No.	QUESTIONS	Marks	COs	KL
8	Explain inter-process communication (IPC) in distributed systems. Discuss the role of message passing and shared memory in enabling communication between processes.	10	CO2	K3
9	Describe the various kernel structures used in real-time and embedded systems: Monolithic kernel, Microkernel, Nano kernel, and Interrupt-driven models. Compare their advantages and limitations.	10	CO2	K4
10	Explain the working of a Distributed File System (DFS). How does it handle file access, consistency, and replication in a distributed environment?	10	CO3	K2
11	Explain the concept of Cluster Computing and discuss the role of MOSIX OS in enabling process migration and load balancing in cluster environments.	10	CO4	K2
12	Define Grid Computing. Describe the key components of Grid architecture and explain how resource management is handled in a grid environment.	10	CO3	K2

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

Course Outcomes	CO1	Student should demonstrate understanding of design issues of advanced operating systems and compare different types of operating systems.
	CO2	Analyze design aspects and data structures used for different subsystems of Advanced OS
	CO3	Demonstrate understanding of different architectures used in Distributed OS and analyze their design issues
	CO4	Demonstrate understanding of different architectures used in Multiprocessor OS and their scheduling algorithms.
	CO5	Classify Real Time OS and analyze various real time scheduling algorithms.

GRAPHICAL REPRESENTATION





ARKA JAIN University Jharkhand — NAAC GRADE A ACCREDITED UNIVERSITY			[10-05-2025] END SEM EXAMINATION School of Engineering & IT
Program	Computer Science & Engineering	Program	B. Tech
Subject Name	Open Elective -IV- Soft Computing	Session	Even, 2024-2025
Semester	VIII	Year	May, 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 is soft computing? Compare soft computing vs. hard computing.	2	CO1	K1
ii	Draw and define artificial neural network, Define the term "axon", Write about "synapse".	2	CO3	K2
iii	Differentiate between fuzzy set and crisp set.	2	CO2	K3
iv	What is Genetic Algorithm Write its applications.	2	CO2	K2
v	Analyse various operators of GA and also explain GA evaluation procedure	2	CO2	K4
vi	Write short notes on air conditioner control using fuzzy logic.	2	CO2	K4
vii	What is feature Map? How it is useful in Neural Network?	2	CO3	K4
viii	Explain input layer, hidden layer & output layer computations in Backpropagation Network.	2	CO3	K1
ix	Analyse the term "back propagation".	2	CO1	K4
x	Explain about the mutation operator.	2	CO2	K3

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Draw a typical McCulloch-Pitts neuron model.	05	CO3	K3
3	What is activation function? Explain Various types of activation functions used in artificial neural network.	05	CO1	K1
4	Explain with an example how supervised learning happens in neural networks.	05	CO3	K4
5	Two fuzzy relations R and S are given by: R: X1 (Y1 0.6, Y2 0.3); X2 (Y1 0.2, Y2 0.9) S: Y1 (Z1 0.1, Z2 0.5, Z3 0.3); Y2 (Z1 0.8, Z2 0.4, Z3 0.7) Find Fuzzy relation T using MAX-MIN composition.	05	CO1	K5
6	Implement Optimization of Traveling Salesman Problem using Genetic algorithm approach.	05	CO4	K5
7	What do you understand by fuzzification and defuzzification. Explain.	05	CO1	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
8	Derive AND(2inputs) OR(Two inputs) NOT function using Perceptron learning Rule.	10	CO3	K6
9	Derive perceptron learning rule and delta learning rule.	10	CO3	K6
10	Determine the union and intersection of the fizzy sets, where A = {(1.0.1l). (2.0.5). (3, 0.8), (4, 1.0). (5.0.7). (6.0.2)} and B= {(1.1l). (2.0.8). (3.0.4), (4.0.1)} .(	10	CO1	K5
11	Implement Optimization of Traveling Salesman Problem using Genetic algorithm approach.	10	CO4	K5
12	What is meant by membership function? Explain various membership functions of fuzzy logic systems in detail. What are fuzzy composition operations? Explain in details.	10	CO1	K3

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

Course Outcomes	CO1	Analyse and appreciate the applications which can use fuzzy logic.
	CO2	Understand the designing inference systems.
	CO3	Understand the difference between learning and programming and explore practical applications of Neural Networks (NN).
	CO4	Understand the importance of optimizations and its use in computer engineering fields and other domains.

GRAPHICAL REPRESENTATION

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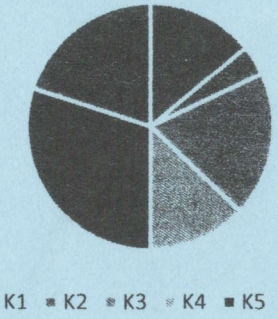
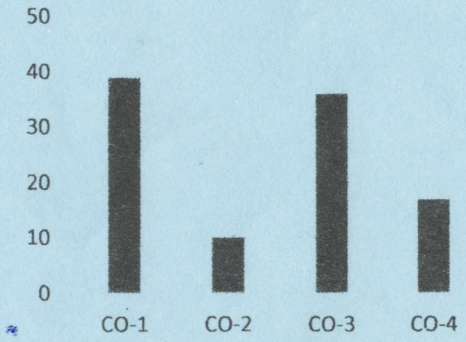


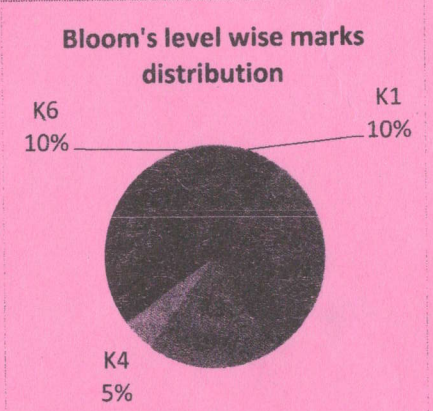
Cource Outcome wise Marks Distribution

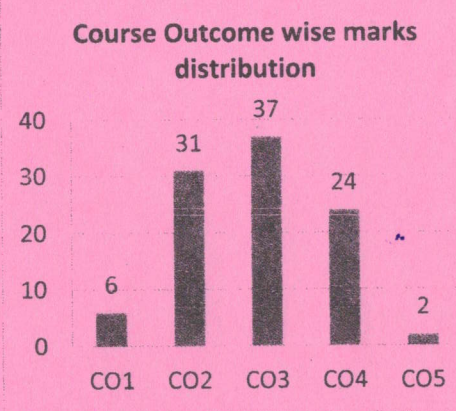


CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Understand Data Warehouse fundamentals, Data Mining Principles
	CO2	Design Data Warehouse with dimensional modelling and apply OLAP operations
	CO3	Identify appropriate data mining algorithms to solve real world problems
	CO4	Compare and evaluate different data mining techniques like classification, prediction, clustering, and association rule mining
	CO5	Describe complex data types with respect to spatial and web mining

GRAPHICAL REPRESENTATION





ARKA JAIN University Jharkhand — NAAC GRADE A

[06-05-2025]
END SEM EXAMINATION
School of Engineering & IT

Program	**Computer Science & Engineering**	**Program**	**B. Tech**
Subject Name	**Elective –VI -Data Mining**	**Session**	**Even, 2024-2025**
Semester	**VIII**	**Year**	**May, 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)**
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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	Draw a suitable figure that shows data mining as a process of knowledge discovery.	2	CO1	K1
ii	What is the purpose of data discretization in data mining?	2	CO4	K2
iii	How is data warehouse different from a database?	2	CO2	K1
iv	Differentiate between OLTP and OLAP.	2	CO2	K1
v	List and describe the steps of KDD process.	2	CO1	K3
vi	Discuss the various OLAP operations in the Multidimensional Data Model.	2	CO2	K3
vii	What are the technologies used in data mining?	2	CO4	K1
viii	Define strong association rule.	2	CO5	K2
ix	List the typical requirements of clustering in data mining.	2	CO1	K2
x	What is the need of confidence measure in association rule mining?	2	CO3	K1

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

Q. No.	QUESTIONS	Marks	COs	KL
2	Implement a scenario where a Data Warehouse is used to improve decision-making in a specific industry, such as healthcare or finance.	05	CO3	K3
3	Analyze the relationship between Data Warehousing and Data Mining. How do they complement each other?	05	CO3	K4
4	Describe the main components of a 3-Tier Data Warehouse Architecture and how they interact.	05	CO4	K3
5	Explain various stages in knowledge discovery process with neat diagram	05	CO2	K2
6	Use the two methods below to normalize the following group of data: 1000,2000,3000,5000,9000 i) min-max normalization by setting min=0 and max=1 ii) z-score normalization	05	CO3	K5
7	Summarize the various pre-processing activities involved in data mining.	05	CO4	K3

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

Q. No.	QUESTIONS	Marks	COs	KL
8	Evaluate how different clustering algorithms can be used for different types of data, such as social media posts versus medical records.	10	CO2	K5
9	Suppose that the data mining task is to cluster the following eight students into three clusters, the distance function is Manhattan. Assign record 1,2,3 as the centroid of each cluster respectively. Use the k-means algorithm to show the final three clusters.	10	CO2	K5

RecordID	Height(cms)	Weight(kgs)
1	145	35
2	165	55
3	170	90
4	135	60
5	140	50
6	160	75
7	150	40
8	155	65

10	Design a simple Data Warehouse schema for an e-commerce application.	10	CO3	K2
11	Use a flowchart to summarize the following procedures for attribute subset selection: a) Stepwise forward selection b) Stepwise backward elimination.	10	CO4	K6
12	Discuss data mining as a step in knowledge discovery process and various challenges associated.	10	CO3	K2