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B.Tech. Computer Science & Engineering - AIML III Semester Examinations (June 2026)

Data Structures (BT-AIML-201A)

Time- 3hrs

Max.Marks-60

Attempt 5 questions in all by selecting one question from each unit. Question 1 is compulsory and each Question carries 12 marks.

Q.1		Marks
(a)	Define an algorithm. List any three essential properties of a good algorithm. What is meant by time–space trade-off in algorithm design? Give a brief example.	2
(b)	What is a sparse matrix? Represent the following sparse matrix using a triplet (row, column, value) array: [[0, 0, 3, 0], [0, 7, 0, 0], [0, 0, 0, 5]]. State one advantage of this representation.	2
(c)	What is a circular linked list? State two advantages of a circular linked list over a singly linked list. Sketch the link structure for three nodes A, B, C in a circular list.	2
(d)	Evaluate the postfix expression: 6 2 3 + * 4 −. Show the stack contents after processing each token.	2
(e)	Define a Binary Search Tree (BST). Insert the keys {40, 20, 60, 10, 30} one by one and draw the resulting BST. State the property that makes it a BST.	2
(f)	Differentiate between Depth-First Search (DFS) and Breadth-First Search (BFS) in terms of: (i) data structure used, (ii) order of traversal, and (iii) one practical application of each.	2

UNIT-I

Q.2a)	Perform Binary Search on the sorted array [5, 12, 20, 35, 47, 60, 70, 85] to find key 47. Show the low, mid, and high pointer values at each step in a table. State the best-case and worst-case time complexity of Binary Search and compare it briefly with Linear Search.	6
Q.2b)	Trace Shell Sort on the array [8, 3, 7, 1, 5, 9, 4, 6] using the gap sequence [4, 2, 1]. Show the array state after each gap phase. State the time complexity of Shell Sort for the best and worst cases.	6
Q.3 a)	Construct a hash table of size 7 and insert keys {4, 8, 15, 16, 23, 42} using the hash function h(k) = k mod 7 with Chaining (separate chaining) as the collision resolution technique. Show the final table layout, calculate the load factor, and state one advantage of chaining over open addressing.	6+6
Q.3b)	Apply Selection Sort on the array [29, 10, 14, 37, 13]. Trace each pass, clearly showing which element is selected and placed at each position. Then compare Selection Sort and Insertion Sort using a table covering: time complexity (best/average/worst), stability, and number of swaps.	

UNIT-II

Q.4a)	Write pseudocode for the following operations on a Circular Singly Linked List: (i) Insert a node at the end, (ii) Delete a node with a given value, (iii) Display all nodes. Illustrate the structure before and after each operation using pointer diagrams for a 3-node list.	6+6
Q.4b)	Compare Singly Linked List, Doubly Linked List, and Circular Linked List across the	

following criteria: (i) memory per node, (ii) traversal direction, (iii) insertion at beginning (time), (iv) deletion of last node (time), (v) typical use case. Present the comparison in a clearly labelled table.

Q.5a) Reverse a singly linked list with nodes [10 → 20 → 30 → 40 → NULL] using an iterative approach. Show the prev, curr, and next pointer values after each step using a table or diagram. Write the pseudocode for the reversal. State the time and space complexity **6**

Q.5b) Explain the need for a Doubly Linked List over a Singly Linked List. Write pseudocode to delete a node with a given key from a Doubly Linked List, handling all cases: (i) node is head, (ii) node is tail, (iii) node is in the middle. Show pointer updates with a diagram. **6**

UNIT-III

Q.6 a) Implement a Stack using an array of size 5. Perform the following sequence of operations: Push(5), Push(10), Push(15), Pop(), Push(20), Push(30), Pop(), Push(40). Show the stack contents and top pointer after each operation. Handle overflow/underflow conditions in your pseudocode. **6+6**

Q.6 b) Convert the infix expression (A − B) * (C + D) / E to postfix form. Show the operator stack contents and output queue at every step. Then evaluate the postfix expression with A=6, B=2, C=4, D=1, E=5, showing the evaluation stack at each token.

Q.7a) Implement a Circular Queue using an array of size 5. Perform: Enqueue(3), Enqueue(7), Enqueue(11), Dequeue(), Enqueue(15), Enqueue(19). Show the front, rear, and array contents after each operation. Explain how a circular queue overcomes the major drawback of a simple linear queue. **6**

Q.7b) What is a Priority Queue? Explain its implementation using a Max-Heap with the following insertion sequence: {12, 7, 18, 3, 15}. Show the heap array and tree after each insertion. List two real-world applications of priority queues. **6**

UNIT-IV

Q.8 a) Construct a Binary Search Tree (BST) by inserting the keys {50, 30, 70, 20, 40, 60, 80} one by one. Draw the resulting BST. Perform and write the output of: (i) In-order traversal, (ii) Pre-order traversal, (iii) Post-order traversal. What does the in-order traversal of a BST always produce? **6+6**

Q.8 b) Perform BFS and DFS traversals on the undirected graph with edges: A–B, A–C, B–D, B–E, C–F, starting from vertex A. For BFS, show the queue state at each step. For DFS, show the stack state at each step. Write the final traversal order for both.

Q.9 a) Apply Floyd-Warshall algorithm on the directed weighted graph with vertices {A, B, C} and edges: A→B: 3, B→C: 2, A→C: 8. Set up the initial distance matrix D^0. Show the updated distance matrix after each intermediate vertex (D^1, D^2, D^3). Identify the shortest path from A to C. **6**

Q.9 b) Apply Kruskal's algorithm to find the Minimum Spanning Tree (MST) of the undirected weighted graph with edges: A–B:4, A–C:2, B–C:1, B–D:5, C–D:8, D–E:3. Show each edge considered, whether it is accepted or rejected (cycle check), and the final MST with its total weight. State the time complexity of Kruskal's algorithm. **6**

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B.Tech. Computer Science & Engineering - AIML III Semester Examinations (Jun 2026)
Object Oriented Programming (BT-AIML-203A)

Time- 3hrs
Max. Marks-60

Attempt 5 questions in all by selecting one question from each unit. Question 1 is compulsory and each Question carries 12 marks.

		Marks
Q.1	**Define the following**	
(a)	Object	2
(b)	Data Abstraction	2
(c)	Scope resolution operator	2
(d)	Header File	2
(e)	Friend function	2
(f)	Destructors	2
	UNIT-I	
Q.2(a)	Discuss advantages and applications of OOP.	6
Q.2(b)	What is a Namespace? Explain the types and relevance of namespace with an example.	6
Q.3(a)	Design a class to illustrate the concept of public and private access specifiers.	7
Q.3(b)	Differentiate between structure and class.	5
	UNIT-II	
Q.4(a)	Build a class hierarchy for Machine Learning Models using inheritance. Create a base class ML Model and derive classes such as Linear Regression and Decision Tree. Demonstrate function overriding with suitable methods and explain the output.	7
Q.4(b)	State few uses of THIS pointer.	5
Q.5(a)	Explain different types of constructors in C++. Write down their syntax. State few differences between constructor and member function.	7
Q.5(b)	With the help of diagrams explain different types of inheritance in C++. What is the effect of deriving a class in public, private, and protected mode?	5
	UNIT-III	
Q.6(a)	What is a virtual function in C++? Illustrate its role in achieving runtime polymorphism. Also, mention the syntax of a pure virtual function.	8
Q.6(b)	What is the difference between static and dynamic binding?	4
Q.7(a)	Write a program to overload + and - operator for a class of rational numbers.	7
Q.7(b)	Write a program to overload ++ operator to increment value of class object.	5
	UNIT-IV	
Q.8(a)	What is a function template? Write a C++ program to create a function template for swapping two values of different data types.	9
Q.8(b)	Write a C++ program to demonstrate file handling using text files for reading data.	3
Q.9(a)	What is an exception? Explain complete exception handling mechanism in C++.	9
Q.9(b)	Explain multiple catch blocks in C++	3

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B.Tech. Computer Science & Engineering – AIML III Semester Examinations (June 2026)

Linear Algebra for AIML (ASH-MAT-201A)

Time- 3hrs

Max. Marks-60

Attempt 5 questions in all by selecting one question from each unit. Question 1 is compulsory and each Question carries 12 marks.

Q.1		Marks
(a)	Express that vector $(1,-2,5)$ as a linear combination of the vectors $(1,2,3),(2,-1,1)$.	3
(b)	Define the linear transformation.	3
(c)	What is inner product space?	3
(d)	Give the name of six applications of SVD.	3

UNIT-I

Q.2(a)	Prove that the set C of all complex numbers is a vector space over the field of all real numbers where addition is defined by $(x_1,x_2)+(y_1,y_2)=(x_1+y_1,\ x_2+y_2)$ for all $(x_1,x_2),(y_1,y_2)\in C$ and scalar multiplication is defined by $a(x_1,x_2)=(ax_1,ax_2)$, for all $a\in R$.	6
Q.2(b)	Show that the set $\{(2,1,4),(1,-1,2),(3,1,-2)\}$ forms a basis of $R^3(R)$.	6
Q.3 (a)	Prove that the set of all matrices of the form $\begin{bmatrix} x & y \\ -y & x \end{bmatrix}$ where x, y $\in$ C, is a vector space over C with respect to matrix edition and scaler multiplication.	6
Q.3 (b)	Prove that $S=\{(1,0,0),(1,1,0),(0,1,0)\}$ spans the vector space $R^3(R)$but is not a basis set.	6

UNIT-II

Q.4(a)	Show that linear transformation $T: R^2\to R^3$ defined by $T(x,y)=(x,x-y,x+y)$ is a linear transformation and is one to one but not onto.	6
Q.4(b)	If $T: R^3\to R^3$ be a linear operator defined by $T(x,y,z)=(x+z,x-z,y)$. Show that T is invertible and find T^{-1}.	6
Q.5(a)	Let $T: R^2\to R^2$ be a linear operator defined by $T(x,y)=(x,2x-y)$. Show that T is invertible and find the formula for T^{-1}.	6
Q.5(b)	Let $u_1=(1,1)$, $u_2=(0,1)$ be a basis of R^2. Let $T: R^2\to R$ be the linear transformation for which $T(u_1)=3$ and $T(u_2)=-2$. Find the linear transformation T.	6

UNIT-III

Q.6(a)	If V be an inner product space. Then show that $\|u+v\|\le\|u\|+\|v\|$.	6
Q.6(b)	Obtain an orthonormal basis with respect to standard inner product for the subspace of R^3generated by (1, 0, 1), (1, 0, -1) and (0, 3,4).	6

Q.7(a) If the vectors $u_1 = (1, 2i, i), u_2 = (0, 1 + i, 1), u_3 = (2, 1 - i, i) \in C^3$, then **6**

(i) Find the norm of each vector

(ii) Show that vector v = (1-i, -1, 1-i) is orthogonal to both u_1 and u_2.

(iii) Obtain a vector which is orthogonal to both u_1 and u_2.

Q.7(b) Let $u = (1 + i, i, -1), v = (1 + 2i, 1 - i, 2i)$ find $\langle u, v\rangle$ and $\langle v, u\rangle$ is $\langle u, v\rangle = \langle v, u\rangle$? **6**

UNIT-IV

Q.8(a) Prove that the similar matrices have same determinant and also same trace. **6**

Q.8(b) Express the matrix $A=\begin{bmatrix}2 & 3 & 1\\ 4 & 7 & 7\\ 6 & 18 & 22\end{bmatrix}$ in to lower and upper triangular matrix. **6**

Q.9 Find the singular value decomposition of matrix $A = \begin{bmatrix}2 & 0 & 0\\ 0 & 3 & 4\\ 0 & 4 & 3\end{bmatrix}$. **12**

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B.Tech. Computer Science & Engineering - AIML III Semester Examinations (June 2026)
Artificial Intelligence (BT-AIML-205A)

Time- 3hrs
Max.Marks-60

Attempt 5 questions in all, selecting one question from each unit and Question 1 is compulsory. Each Question carries 12 marks.

Q.1		Marks
(a)	Define Machine Learning.	1.5
(b)	Explain unification with an example.	1.5
(c)	What is meant by clause form in logic?	1.5
(d)	Differentiate between fuzzy logic and classical logic.	1.5
(e)	Define knowledge representation in Artificial Intelligence.	1.5
(f)	Define matching in rule-based systems.	1.5
(g)	What is a planning graph?	1.5
(h)	Define partial order planning.	1.5

UNIT-I

Q.2(a)	Explain the concept of Artificial Intelligence and discuss its major applications in modern society.	6
Q.2(b)	Compare different types of intelligent agents and explain how learning agents improve system performance.	6
Q.3(a)	Analyze the impact of Artificial Intelligence on education, healthcare, and transportation with suitable examples.	6
Q.3(b)	Explain the working principles and real-world significance of AI systems such as ChatGPT, AlphaFold, and Tesla Autopilot.	6

UNIT-II

Q.4(a)	Explain the importance of predicate logic in AI-based reasoning. Applying FOPL to Real-World AI Statements which are listed below: (1) Every robot that has low battery power must return to the charging station. (2) All doctors who use AI diagnostic systems can detect diseases more accurately. (3) Every smart home system that detects smoke automatically activates the alarm system.	6
Q.4(b)	Explain the working of Breadth First Search (BFS) and Depth First Search (DFS) algorithms with suitable examples in state space search problems.	6
Q.5(a)	Analyze the Hill Climbing search technique and explain its advantages, limitations, and applications in Artificial Intelligence problems.	6

Q.5(b)	Explain the working principle of the Genetic Algorithm with the help of suitable examples. Discuss the roles of selection, crossover, and mutation in optimization problems.	**6**

UNIT-III

Q.6(a)	Analyze the role of matching and conflict resolution strategies in rule-based expert systems.	**6**
Q.6(b)	Explain the concept of Backward Chaining and how it differs from Forward Chaining. Using an example, demonstrate how Backward Chaining works in practice.	**6**
Q.7(a)	Explain non-monotonic reasoning and default reasoning with suitable examples from real-world problem solving.	**6**
Q.7(b)	Explain weak and strong slot-and-filler structures, and describe the role of scripts in knowledge representation systems.	**6**

UNIT-IV

Q.8(a)	Write a short note on following: (1) Hierarchical planning (2) Multi-agent planning	**6**
Q.8(b)	Compare partial-order planning and planning graphs, highlighting their advantages and limitations.	**6**
Q.9(a)	Analyze different planning approaches in Artificial Intelligence based on efficiency, flexibility, and computational complexity.	**6**
Q.9(b)	Analyze the planning problem and explain how state-space search is used to generate plans.	**6**

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B.Tech. Computer Science & Engineering-AIML/AIDS/CYS

III Semester Examinations (June 2026)

Digital System Design (BT-ECE-223A)

Time- 3hrs

Max. Marks-60

Attempt 5 questions in all by selecting one question from each unit. Question 1 is compulsory and each Question carries 12 marks.

Q.1		Marks
(a)	Explain XOR gate with truth table.	2
(b)	Give difference between Latch and Flip-Flop.	2
(c)	Write excitation table of SR-FF.	2
(d)	Define demultiplexer with an example.	2
(e)	Explain the concept of step size in converters with suitable context.	2
(f)	Give Difference between ROM and RAM	2

UNIT-I

Q.2(a)	Minimize the given function using K-Map and realize using AND-OR implementation (AOI): $f = \sum m(0,1,2,3,5,8,10,12,14) + d(4,7,13)$	8
Q.2(b)	Analyze why NAND gate is termed as universal gate.	4
Q.3(a)	Design and implement a Full Subtractor.	6
Q.3(b)	Implement given function using 8:1 Multiplexer $f = \sum m(1,2,3,6,7,8,11,12,14)$	6

UNIT-II

Q.4(a)	Define Flip-flops. Explain different types flip-flops with truth tables.	8
Q.4(b)	Convert a SR-FF to D-FF.	4
Q.5(a)	Design a Mod-6 synchronous counter	6
Q.5(b)	Explain the working of Parallel-In Serial-Out Shift Register with diagram.	6

UNIT-III

Q.6(a)	Design a 1-bit magnitude comparator.	6
Q.6(b)	Explain the working of Weighted-Resistor DAC with diagram.	6
Q.7(a)	Design octal to binary encoder.	4
Q.7(b)	Explain and analyze the working of Dual Slope ADC with suitable diagram.	8

UNIT-IV

Q.8	Write short notes on: I. EEPROM II. DRAM III. PLA	12
Q.9(a)	Implement Full Adder using PLA.	8
Q.9(b)	Compare PROM, PLA and PAL.	4

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D-31

B.Tech. Computer Science & Engineering-AIML IV Semester Examinations (Jun 2026)

Design & Analysis of Algorithms (BT-AIML-202A)

Time- 3hrs

Max. Marks-60

Attempt 5 questions in all by selecting one question from each unit. Question 1 is compulsory and each Question carries 12 marks.

Q.1		Marks
(a)	Define an algorithm. Explain characteristic of an algorithm.	2
(b)	What is time complexity of Merge Sort Algorithm?	2
(c)	Explain Theta notation.	2
(d)	What are disjoint sets?	2
(e)	What is Greedy algorithm?	2
(f)	What is a Spanning tree?	2

UNIT-I

Q.2(a)	What do you mean by Asymptotic Notation? Write and explain different types of asymptotic notations with suitable examples.	6
Q.2(b)	Explain Recurrence relation.	6
Q.3(a)	What is Divide and Conquer Strategy? Explain Quick Sort algorithm with the help of a example.	6
Q.3(b)	Discuss Strassen's matrix multiplication algorithm with the help of a suitable example.	6

UNIT-II

Q.4	Explain job sequencing with deadline.	12
Q.5(a)	Explain 0/1 Knapsack problem using dynamic programming. Elaborate your answer with a suitable example.	6
Q.5(b)	Explain traveling salesman problem with the help of a suitable example.	6

UNIT-III

Q.6(a)	What do you mean by backtracking? Explain sum of subsets.	6
Q.6(b)	Write an algorithm for N queen problem and compute its complexity.	6
Q.7	Explain traveling salesman problem with branch and bound strategy.	12

UNIT-IV

Q.8(a)	Explain Ford Fulkerson algorithm.	6
Q.8(b)	Explain single source shortest path algorithm with the help of a suitable example.	6
Q.9	Write short notes on: i. Red-Black Trees ii. Polynomial vs Non-Polynomial Complexity	6+6

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B.Tech. Computer Science & Engineering (AI & ML) IV Semester Examinations (Jun 2026)

Machine Learning Techniques (BT-AIML-204 A)

Time- 3hrs

Max. Marks-60

Attempt 5 questions in all by selecting one question from each unit. Question 1 is compulsory and each Question carries 12 marks.

		Marks
Q.1	Answer the Following:	
(a)	State any two real-world applications of machine learning.	2
(b)	Why can outliers adversely affect machine learning models?	2
(c)	State the Bias-Variance Tradeoff. What happens to bias and variance when you increase model complexity?	2
(d)	Differentiate between normalization and feature scaling with suitable examples.	2
(e)	Distinguish between Binary Classification and Multiclass Classification.	2
(f)	What are the two core hyperparameters required by the DBSCAN algorithm?	2

UNIT-I

Q.2(a) Explain feature engineering. Discuss how normalization, encoding, and feature selection collectively improve model quality. **6**

Q.2(b) Explain the different types of data and discuss the important characteristics of dataset used in machine learning. **6**

Q3 (a) A machine learning engineer trains three models using the same dataset.

Model	Training Accuracy	Testing Accuracy
Model A	97%	61%
Model B	75%	72%
Model C	88%	86%

6

(1) Analyze the learning behavior exhibited by each model and identify possible model fitting issues.

(2) Evaluate the generalization capability of all three models and justify which model should be selected for deployment.

Q.3(b) Feature scaling is a crucial preprocessing step for many algorithms. **6**

(a) Explain the step-by-step process of Min-Max Scaling (Normalization).

(b) Explain the step-by-step process of Standardization (Z-score normalization).

UNIT-II

Q.4(a) A dataset contains the following observations:

45, 48, 50, 52, 49, 47, 180 **6**

(a) Compute the mean and standard deviation.

(b) Determine the Z-score corresponding to the observation 180.

Q.4(b) Explain the various techniques used to handle missing values in a dataset. Also, differentiate between normalization and standardization with suitable examples. **6**

Q.5(a) Consider the following feature correlation matrix:

Feature	Age	Income	Spending Score
Age	1	0.82	−0.45
Income	0.82	1	0.28
Spending Score	−0.45	0.28	1

2x3=6

(a) Identify features exhibiting strong correlation. (b) Discuss possible implications o multicollinearity (c) Recommend an appropriate feature selection strategy.

Q.5(b) Discuss the importance of encoding techniques in machine learning and compare different encoding methods based on their working principles, advantages, limitations, and effect on model performance **6**

UNIT-III

Q.6(a) Explain Linear Regression and its different types. Also, compare Linear Regression and Logistic Regression based on their working principles, applications, and output characteristics. **6**

Q.6(b) Explain the concept of Support Vector Machine (SVM) and discuss its working principle for classification problems. Also, explain the role of hyperplanes, support vectors, and kernels in SVM. **6**

Q.7 A binary classifier produced the following confusion matrix:

	Predicted Positive	Predicted Negative
Actual Positive	45	10
Actual Negative	15	30

12

Calculate: (a) Accuracy (b) Precision (c) Recall (d) F1-score (2 x 4= 8 marks) Interpret model performance. (4 Marks)

UNIT-IV

Q.8 Consider the following dataset:

Data Point	X	Y
P1	1	2
P2	2	1
P3	5	4
P4	6	5

12

Apply k-Means clustering with K=2, Initial centroids C1= (1,2), C2 = (5,4). Perform one iteration of clustering using Euclidean distance and determine updated centroid positions. What can be concluded in the K-Means clustering algorithm if there is no change in centroid positions in the next iteration?

Q.9(a) Explain the concept of Hierarchical Clustering and describe its working procedure. Differentiate between agglomerative and divisive hierarchical clustering techniques with suitable examples. **6**

Q.9(b) A geographical dataset contains irregular cluster shapes and noise points. Analyze whether DBSCAN would be preferable over k-Means clustering. **6**

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B.Tech. Computer Science & Engineering -AIML IV Semester Examinations (Jun 2026)
Operating Systems (BT-AIML-206A)

Time- 3hrs
Max.Marks-60

Attempt 5 questions in all by selecting one question from each unit. Question 1 is compulsory. Each Question carries 12 marks.

Q.1	UNIT: I-IV	Marks
a)	Define kernel and mention any two types of kernels.	2
b)	Differentiate between process and program.	2
c)	What is CPU scheduling? Mention any two scheduling criteria.	2
d)	Define starvation and aging in Operating Systems.	2
e)	What is virtual memory? Mention its advantages.	2
f)	What is DMA? How is it useful in I/O operations?	2

UNIT-I

Q.2 (a)	Explain different components of an Operating System and their functions.	6
Q.2 (b)	Discuss multiprogramming and multitasking operating systems with suitable examples.	6
Q.3 (a)	Explain process states and Process Control Block (PCB) with suitable diagram.	6
Q.3 (b)	Describe different types of system calls used in Operating Systems.	6

UNIT-II

Q.4 Consider the following processes with their arrival time and burst time:

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	4	1
P4	5	4

Using the Shortest Job First (Non-Preemptive) CPU scheduling algorithm:

a)	Draw the Gantt Chart.	3
b)	Calculate the Waiting Time for each process.	3
c)	Calculate the Turnaround Time for each process.	3
d)	Find the Average Waiting Time and Average Turnaround Time.	3
Q.5 (a)	Explain race condition and discuss Peterson's solution for process synchronization.	6
Q.5 (b)	Discuss monitors and compare them with semaphores.	6

UNIT-III

Q.6 Consider a system with four processes P0 to P3 and three resource types A, B, and C with total number of instances as 6, 5, and 7 respectively. At a particular instant, the system has the following Allocation and Maximum matrices:

Allocation Matrix

Process	A	B	C
P0	1	1	0
P1	1	2	1
P2	1	0	3
P3	2	1	1

Maximum Matrix

Process	A	B	C
P0	3	2	2
P1	1	3	3
P2	4	2	3
P3	3	3	2

Available

A	B	C
1	1	2

a) Calculate the Need Matrix. **3**

b) Using Banker's Algorithm, determine whether the system is in a safe state or not. **6**

c) If the system is safe, find the safe sequence. **3**

Q.7 (a) Explain contiguous memory allocation and fragmentation in memory management. **6**

Q.7 (b) Explain Optimal and LFU page replacement algorithms with suitable examples. **6**

UNIT-IV

Q.8 (a) Discuss file access methods and directory structures in Operating Systems. **6**

Q.8 (b) Explain I/O hardware, interrupts, and device controllers with suitable diagrams. **6**

Q.9 (a) Differentiate between polling and interrupt-driven I/O techniques. **6**

Q.9 (b) Apply SSTF disk scheduling algorithm for the request queue: 95, 180, 34, 119, 11, 123, 62, 64 with initial head position at cylinder 50. Calculate the total head movement. **6**

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B.Tech. Computer Science & Engineering -AIML IV Semester Examinations (Jun 2026)

Applied Statistical Analysis (BT-AIML-208A)

Time- 3hrs

Max. Marks-60

Attempt 5 questions in all by selecting one question from each unit. Question 1 is compulsory and each Question carries 12 marks.

Q.1		Marks
(a)	Define and distinguish between Define qualitative and quantitative data	2
(b)	Differentiate between Census vs sampling methods	2
(c)	Explain the significance of Mean and median in data analysis	2
(d)	Differentiate between Discrete vs continuous variables with examples	2
(e)	Define and explain the purpose of a Null hypothesis	2
(f)	State and explain Pearson correlation and its significance	2

UNIT-I

Q.2(a)	Explain and illustrate the major stages involved in the research process.	6
Q.2(b)	Differentiate and analyze experimental data and survey data with examples.	6
Q.3	Analyze and explain the concepts of sample, parameter, statistic, independent/dependent variables with examples.	12

UNIT-II

Q.4	Examine and compare measures of central tendency and dispersion with suitable examples.	12
Q.5(a)	Explain probability distributions.	6
Q.5(b)	A sample of 100 has mean 52 and standard deviation 8. Calculate and interpret the 95% confidence interval for the population mean.	6

UNIT-III

Q.6	Analyze and explain Type-I and Type-II errors and illustrate the procedure for hypothesis testing.	12
Q.7(a)	Apply hypothesis testing to test the population mean for a large sample.	6
Q.7(b)	Explain and evaluate the concept of ANOVA and its applications in statistical analysis.	6

UNIT-IV

Q.8	Compare and analyze Pearson and Spearman correlation techniques with suitable examples.	12
Q.9(a)	Explain and interpret the concept of simple linear regression with a suitable example.	6
Q.9(b)	Compare and evaluate multiple regression and polynomial regression techniques.	6

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