

MACHINE LEARNING

Marks: 10 x 5 = 50

Answer all the Questions

1. What is Machine Learning?
(Or)
What are the types of Machine Learning?
- 2) Explain Bayesian Linear Regression.
(Or)
List out the applications of Machine Learning.
- 3) Explain linear models for classification.
(Or)
Define Decision Trees.
- 4) Explain about the Neural Networks.
(Or)
Give a short note on Ensemble Methods.
- 5) What is Unsupervised Learning?
(Or)
Explain about the K-means Clustering.
- 6) Define the curse of dimensionality
(Or)
Explain the Principal Component Analysis (PCA)
- 7) Explain Probabilistic Graphical Model.
(Or)
Write briefly about Bayesian Networks
- 8) Explain Markov Random Fields.
(Or)
Explain about Undirected Graphical Models.
- 9) Define Basic Sampling Methods.
(Or)
Write a short note on Exploration Strategies.
- 10) Explain the Semi – Supervised Learning.
(Or)
Explain the Computational Learning Theory.

OBJECT ORIENTED PROGRAMMING AND DESIGN

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Answer all the Questions

1) Explain the basic concepts of OOPS?

(Or)

Write a short note on structure & union in C++?

2) What is friend function in C++ and explain with suitable program?

(Or)

Write a C++ program using Inline function?

3) Illustrate the work of “constructor” in C++ program?

(Or)

Write a C++ program having object as function argument?

4) Explain briefly about two dimensional array?

(Or)

How to access the address of the variable using pointers in C++.

5) Write a short note on function overloading in C++ with examples program.

(Or)

How to overload a constructor in C++?

6) Explain inheritance and its types .

(Or)

Write a C++ program to implement multi level inheritance?

7) Write a short note on derived class constructor.

(Or)

What is virtual base class in C++?

8) List out difference between class template & function template?

(Or)

Illustrate the concept of exception handling in C++ with suitable program.

9) How to overload a function template in C++.

(Or)

Write a c++ program using this pointer?

10) How does the error handling file operation in C++.

(Or)

How to access a files, with C++ program, explain it with suitable program?

OPTIMIZATION TECHNIQUES

Marks: 10 x 5 = 50

Answer all the Questions

- 1) Write simplex algorithm.

(Or)

Use simplex method to solve the LPP

Maximum $x = 4x_1 + 10x_2$

Subject to constraints $2x_1 + x_2 \leq 50$, $2x_1 + 5x_2 \leq 100$, $2x_1 + 3x_2 \leq 90$,

$x_1 \geq 0$ and $x_2 \geq 0$.

- 2) Obtain the dual of the following primal problem.

Maximum $x = 2x_1 + 3x_2 + x_3$

Subject to constraints $4x_1 + 3x_2 + x_3 = 6$, $4x_1 + 3x_2 + 5x_3 \leq 4$,

$x_1, x_2, x_3 \geq 0$.

(Or)

Use the simplex method to solve the LPP

Maximize $z = -3x_1 - x_2$

Subject to $x_1 + x_2 \geq 1$, $2x_1 + 3x_2 \geq 2$, $x_1, x_2 \geq 2$, $x_1, x_2 \geq 0$.

- 3) Explain i) north west corner method ii) least cost method iii) vogels approximation method.

(Or)

Obtain an initial basic feasible solution to the following transportation problem using vogel's approximation method.

	I	II	III	IV	availability
A	5	1	3	3	34
B	3	3	5	4	15
C	6	4	4	3	12
D	4	-1	4	2	19
Requirement	21	25	17	17	

- 4) Write the transportation algorithm.

(Or)

Solve the travelling salesman problem

-	4	7	3	4
4	-	6	3	4
7	6	-	7	4
3	3	7	-	7
4	4	5	7	-

5) Solve the game whose pay off matrix is

$$\begin{array}{c} \text{Player B} \\ \text{Player A} \end{array} \begin{bmatrix} 8 & -3 \\ -3 & 1 \end{bmatrix}$$

(Or)

Solve the game using graphically

$$\begin{array}{c} \text{Player B} \\ \text{Player A} \end{array} \begin{bmatrix} 2 & 1 & 0 & -2 \\ 1 & 0 & 3 & 2 \end{bmatrix}$$

6) Using dominance property solve

$$\begin{array}{c} \text{Player B} \\ \text{Player A} \end{array} \begin{bmatrix} -5 & 3 & 1 & 20 \\ 5 & 5 & 4 & 6 \\ -4 & -2 & 0 & -5 \end{bmatrix}$$

(Or)

A project has the following time schedule

Activity	1-2	1-3	2-4	2-5	3-4	4-5
Time duration	8	4	2	10	5	3

7) Explain deterministic model in inventory problem.

(Or)

Explain ECQ model with uniform demand.

8) Explain inventory model with planned shortages.

(Or)

Explain inventory model with quantity discount.

9) Explain birth death queuing system.

(Or)

Explain (M/M/1): (∞ /FIFO) model in queuing system.

10) Explain i) Arrival characteristic ii) waiting line characteristics

(Or)

Explain characteristics of service systems.