

**School of Distance Education,  
University of Kerala  
M.Sc. Computer Science (2023 admission)  
Second Semester Assignment Questions**

**DCS 21 Modern Operating Systems**

1. Explain
  - a) Mainframe Systems
  - b) Multithreading Models
  - c) Semaphore
  - d) Acyclic Graph Directories
2. Differentiate Bits algorithm & Second chance Algorithm.
3. How can we prevent the occurrence of a deadlock. Explain in detail.
4. Write about page buffering algorithms.
5. What are the criteria for allocation of frames?

**DCS22 Advances in Database Management**

1. Write a note on multimedia database.
2. List the advantages and limitations of OODBMS.
3. Write short note on
  - a) Gnome database
  - b) Armstrong's Axioms
  - c) Two phase commit Protocol
  - d) Transaction-Server Architecture
4. Write a note on knowledge database.
5. What are the things to consider while reducing ER Schema to table?

**DCS 23 Object Oriented Analysis and Design**

1. Explain about UML Diagrams with examples.
2. Write a short note on the followings
  - a) Composition
  - b) Multiplicity
  - c) Generalization
  - d) Specialization
  - e) CRC Cards
3. Discuss classification and method of identifying classes in detail.
4. What is association? Explain with an example also explain the ways of eliminating unnecessary associations.
5. Explain FLOOT in detail.

## DCS24 Graphics and Multimedia Systems

1. Explain about Bresenham line drawing algorithm.
2. Explain
  - a) 3D transformations.
  - b) Lz77 approach.
3. Briefly explain any two video file formats.
4. Describe Huffman coding and give some applications of Huffman coding.
5. How animation video work in multimedia?

## DCS25 Optimization Techniques

1. Consider a chocolate manufacturing company that produces only two types of chocolate
  - A and B. Both the chocolates require Milk and Choco only. To manufacture each unit of A and B, the following quantities are required:
    - Each unit of A requires 1 unit of Milk and 3 units of Choco
    - Each unit of B requires 1 unit of Milk and 2 units of Choco

The company kitchen has a total of 5 units of Milk and 12 units of Choco. On each sale, the company makes a profit of

- Rs 6 per unit A sold
- Rs 5 per unit B sold.

Now, the company wishes to maximize its profit. How many units of A and B should it produce respectively?

2. Use Simplex method to solve

$$\text{Minimize : } -z = -8x_1 - 10x_2 - 7x_3$$

$$\text{s.t. : } x_1 + 3x_2 + 2x_3 \leq 10$$

$$-x_1 - 5x_2 - x_3 \geq -8$$

$$x_1, x_2, x_3 \geq 0$$

3. The ICARE Company has three plants located throughout a state with production capacity 50, 75 and 25 gallons. Each day the firm must furnish its four retail shops R1, R2, R3, & R4 with at least 20, 20, 50, and 60 gallons respectively. The transportation costs (in Rs.) are given below

Company	Retail				Supply
	R1	R2	R3	R4	
P1	3	5	7	6	50
P2	2	5	8	2	75
P3	3	6	9	2	25
Demand	20	20	50	60	

The economic problem is to distribute the available product to different retail shops in such a way so that the total transportation cost is minimum?

4. A plant manager has four subordinates, and four tasks to be performed. The subordinates differ in efficiency and the tasks differ in their intrinsic difficulty. This estimate of the times each man would take to perform each task is given in the effectiveness matrix below.

	I	II	III	IV
A	8	26	17	11
B	13	28	4	26
C	38	19	18	15
D	19	26	24	10

How should the tasks be allocated, one to a man, so as to minimize the total man hours?

5. The following details are available regarding a project:

Activity	Predecessor Activity	Duration (Weeks)
A	-	3
B	A	5
C	A	7
D	B	10
E	C	5
F	D,E	4

Determine the critical path, the critical activities and the project completion time.

\*\*\*