II Semester M. Sc Computer Science (2018 Batch)
School of Distance Education
University of Kerala
Assignment Questions
(Answer All Questions   Max Marks:10 for each Subject)

DCS21 Modern Operating Systems

1. Explain
   a) System Programs
   b) System Structure
   c) Virtual Machine
   d) Operating system services

2. Explain the following concepts associated with Virtual Memory
   a) Page replacement
   b) Demand Paging
   c) Allocation of frames
   e) Thrashing

3. Explain the following terms associated with Security
   a) Security problem
   b) User authentication
   c) Program threats
   d) OS Security functions
   e) Trusted Operating Systems

DCS22 Advances in Database Management

1. Give an Introduction to database systems and its architecture
2. Explain the different types of normal forms
3. Explain ER Modelling and Object Oriented DBMS
4. Detail about the architecture and function of Distributed DBMS

DCS23 Object Oriented Analysis and Design

1. Explain the following object oriented Concepts
   a) Objects
   b) Attributes and Methods
   c)Encapsulation and Information Hiding
   d) Messages
   e) Class Hierarchy, Inheritance, Polymorphism, Genericity
2. Explain View Layer: Designing Interface
3. Explain software Testing and Maintenance

DCS24 Graphics & Multimedia Systems

1. Explain the midpoint circle drawing algorithm

2. Explain Window to viewport transformation

3. Explain anyone clipping algorithm in detail

4. Give the significance of projections in detail

5. Explain any one hidden surface removal technique

6. Explain JPEG standard in detail

7. Explain animation process in detail. Give the name of some tools also.

8. Explain any one of the audio encoding techniques

DCS 25 Optimization Techniques

1. Find the dual of the following problem. Maximize $Z = 5x_1 + 8x_2$ subject to $4x_1 + 9x_2 \geq 100$

$$2x_1 + x_2 \leq 20$$
$$2x_1 + 5x_2 \geq 120; x_1 \text{ and } x_2 \geq 0$$

2. Solve the assignment problem which minimizes the total unit cost

Plant

$$\text{Product} \begin{bmatrix} 10 & 8 & 12 \\ 18 & 6 & 14 \\ 6 & 4 & 2 \end{bmatrix}$$

3. Solve the assignment problem which minimizes the total unit cost

$$\begin{array}{c} & A & B & C & D \\ 1 \\ 2 \\ 3 \\ 4 \end{array} \begin{bmatrix} 1 & 4 & 6 & 3 \\ 9 & 7 & 10 & 9 \\ 4 & 5 & 11 & 7 \\ 8 & 7 & 8 & 5 \end{bmatrix}$$

4. Find the maximum value of $Z = 3x_1 - 2x_2$ such that

$$x_1 - x_2 \geq 0, 3x_1 - x_2 \leq 3, \qquad x_1, x_2 \geq 0$$

5. Use simplex method to solve the L.P.P.

Maximise $\quad Z = 5x_1 + 2x_2 + 3x_3 - x_4 + x_5$ subject to the constraints:

$$x_1 + 2x_2 + 2x_3 + x_4 = 8$$
$$3x_1 + 4x_2 + x_3 + x_5 = 7$$
$$x_1, x_2, x_3, x_4, x_5 \geq 0$$

6. Use penalty method to minimize $z = 12x_1 + 20x_2$ subject to the constraints:

$$6x_1 + 8x_2 \geq 100, 7x_1 + 12x_2 \geq 120 \text{ and } x_1, x_2 \geq 0.$$

7. Obtain the dual problem of the following primal problem:

$$\textit{Minimize} \quad z = x_1 - 3x_2 - 2x_3, \quad \textit{subject to the constraints:}$$
$$3x_1 - x_2 + 2x_3 \leq 7,$$
$$2x_1 - 4x_2 \geq 12, -4x_1 + 3x_2 + 8x_3 = 10$$
$$x_1, x_2 \geq 0 \text{ and } x_3 \text{ is unrestricted.}$$

8. Consider four bases of operations B_i and three targets T_j. The tons of bombs per aircraft from any base that can be delivered to any target are given in the following table:

Target (T_j)

		T_1	T_2	T_3
	B_1	8	6	5
Base (B_i)	B_2	6	6	6
	B_3	10	8	4
	B_4	8	6	4

The daily sortie capability of each of the four bases is 150 sorties per daily. The daily requirement in sorties over each individual target is 200. Find the allocation of sorties from each base to each target which maximizes the total tonnage over all the three targets explaining each step.

8. A company has three plants at locations A, B and C, which supply to warehouses located at D, E, F, G and H. Monthly plant capacities are 800, 500 and 900 units respectively Monthly warehouse requirements are 400, 400, 500, 400 and 800 units respectively. Unit transportation costs (in rupees) are given below:

To

		D	E	F	G	H
	A	5	8	6	6	3
From	B	4	7	7	6	5
	C	8	4	6	6	4

Determine an optimum distribution for the company in order to minimize the total transportation cost.

9. Solve the game whose pay-off matrix is given by

	B_1	B_2	B_3
A_1	1	3	1
A_2	0	-4	-3
A_3	1	5	-1

(a)

	B_1	B_2	B_3
A_1	-2	15	-2
A_2	-5	-6	-4
A_3	-5	20	-8

(b)

10. Solve the game whose pay-off matrix is given by using dominance rule

$$\begin{bmatrix} 1 & 7 & 3 & 4 \\ 5 & 6 & 4 & 5 \\ 7 & 2 & 0 & 3 \end{bmatrix}$$