

2020

**OBJECT ORIENTED ANALYSIS AND DESIGN**

Paper : 6-1-4

**(New Course)**

Full Marks : 40

Time : Two hours

**The figures in the margin indicate full marks for the questions.**

Answer **any four** questions.

1. Why is software inherently complex? What are the attributes of a complex system? Give a brief introduction to different categories of analysis and design methods. 3+3+4=10
  
2. What is object model? Explain briefly the elements of object model. 2+8=10

*Contd.*

3. What is class? Explain briefly *any three* kinds of class relationships. 1+3+3+3=10
  
4. What is the importance of modeling? Give an overview of basic building blocks of UML. 4+6=10
  
5. What is class diagram? What are the common properties and contents of a class diagram? 2+3+5=10
  
6. List out the common properties of object and class diagram to represent classes and objects in bank management system. 10
  
7. Discuss the Strengths and Weaknesses of the Use Case Diagram. 10
  
8. Explain UML state machine diagram and modeling. 10
  
9. Discuss about UML deployment and component diagram. 10
  
10. Write short notes on : **(any two)** 5×2=10
  - (a) Package diagram
  - (b) Collaboration
  - (c) Object diagram.

2020

**OPTIMIZATION TECHNIQUES**

Paper : BCA-HE-6026

Full Marks : 30

Time : Two hours

**The figures in the margin indicate full marks for the questions.**

**Answer for 30 marks only.**

**UNIT-1**

**(Introduction to Operation Research)**

Answer **any one** question from this unit.

1. (a) Give the main features of Operation Research. 5
- (b) Explain briefly the various applications of Operation Research. 5

**UNIT-2**

**(Linear Programming Techniques)**

Answer **any two** questions from this unit.

2. (a) Explain the Revised Simplex method and compare it with the Simplex method. 5

(b) Explain briefly the graphical method of solving linear programming problems. 5

(c) Prove that the dual of the dual of a given primal is the primal. 5

(d) Solve the following LPP by using Simplex method :

$$\text{Max. } Z = 5x_1 + 3x_2$$

subject to

$$x_1 + x_2 \leq 2$$

$$5x_1 + 2x_2 \leq 10$$

$$3x_1 + 8x_2 \leq 12$$

and  $x_1, x_2 \geq 0$  5

**UNIT-3**

**(Transportation Problem)**

Answer **any one** question from this unit.

3. (a) Define 'loop' in a transportation table. What role do they play? 5
- (b) Explain Vogel's Approximation method of solving a transportation problem. 5

4. Consider the following transportation problem.

From \ To	1	2	3	Supply
1	2	7	4	5
2	3	3	1	8
3	5	4	7	7
4	1	6	2	14
Demand	7	9	18	

- (a) Obtain an initial basic feasible solution by Vogel's Approximation method. 5
- (b) Obtain the optimal solution. 5

**UNIT-4**

**(Assignment Problem)**

Answer **any one** question from this unit.

5. (a) Explain the Hungarian method to solve an Assignment problem. 5
- (b) How can the travelling salesman problem be solved using Assignment algorithm? 5

**UNIT-5**

**(Network Scheduling by PERT/CPM)**

Answer **any one** question from this unit.

6. (a) Distinguish between PERT and CPM techniques. 5

(b) Explain in brief, the following terms commonly used in network of PERT/CPM (**any two**) 5

(i) Activity (ii) Event

(iii) Dummy activity (iv) Critical path

**UNIT-6**

**(Simulation)**

Answer **any one** question from this unit.

7. (a) Briefly explain the Event-Type simulation with an example. 5
- (b) What is meant by Monte-Carlo technique of simulation? Discuss its scope. 5

**UNIT-7**

**(Information Theory)**

Answer **any one** question from this unit.

8. (a) Write **any two** properties of Entropy function (with proof). 5
- (b) Verify the rule of the additivity of Entropies for events A, B and C with probabilities  $\frac{1}{5}$ ,  $\frac{4}{15}$  and  $\frac{8}{15}$  respectively. 5

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**DISTRIBUTED SYSTEMS**

Paper : 6·2·3

Full Marks : 40

Time : Two hours

**The figures in the margin indicate full marks for the questions.**

*Answer Question No. 1 and any three from the rest.*

1. Explain the different goals of distributed system. 4
2. (a) Mention the different types of distributed system. 4  
(b) What is remote procedure call ? Discuss the basic rpc operation. 2+3=5  
(c) Explain in brief, message-oriented communication. 3

*Contd.*

3. (a) Why clock synchronization is required in distributed system? Explain *any one* clock synchronization algorithm. 2+7=9  
(b) What do you mean by mutual exclusion? 3
4. (a) What is the importance of Election algorithm? Explain Bully algorithm. 2+8=10  
(b) Give an example of Election algorithm which is suitable for wireless environment. 2
5. (a) What are the different types of consistency? Does replication improve consistency? 6+1=7  
(b) Explain how replication can help in scaling technique in distributed system. 5
6. (a) Discuss how fault tolerance is achieved in distributed system. 6  
(b) Explain how redundancy can help in failure. 6
7. (a) What is middleware? 2  
(b) Mention the *two* main approaches of consistency protocols. 5  
(c) Why global positioning of nodes is required in distributed system? 5
8. Write short notes on : (*any three*) 4×3=12  
(a) Distributed Information Systems  
(b) Token Ring Algorithm  
(c) Persistent Communication  
(d) Distributed Transaction.

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**SYSTEM ADMINISTRATION USING LINUX**

( Elective-II )

Paper : 6·3

( Old Course )

Full Marks : 50

Time : Two hours

**The figures in the margin indicate full marks for the questions.**

1. Answer the following questions : **(any four)**  
4×4=16

- (a) Write down *any four* advantages of using Linux as an OS.
- (b) What is Redirection and Piping?
- (c) What do you mean by Linux Kernel and Device Drivers?
- (d) Give the general structure and meaning of each field of /etc/fstab file.

*Contd.*

- (e) Briefly explain the significance of /etc/service file.
- (f) Explain the format of the crontab file.

(e) Write the method for 'Configuring the Print Queue' and 'Selecting the Print Driver' in Linux.

2. Differentiate between the following pairs :  
**(any two)** 5×2=10

- (a) Login vs. Non-Login shells
- (b) Absolute vs. Relative pathname
- (c) Mounting vs. Unmounting file system

3. Answer the following questions : **(any three)**  
8×3=24

- (a) Write the meaning of the following Linux Command with an example of each :  
chmod, grep, ping, telnet
- (b) Write short note on 'Monitoring memory usage' and 'Disk space usage'.
- (c) Describe — 'Basic Process Control' and their role in 'Access Control'.
- (d) Discuss the Basic Security Issues of Linux OS.