

P.E.S COLLEGE OF ENGINEERING, MANDYA-571401

(An Autonomous Institution Under VTU Belgaum)

Department of Master of Computer Applications

Model Question Paper – I

Design and Analysis of Algorithms (P15MCA41)

Credits : 04

Max. Marks : 100

Time : 3 hrs

Note: Answer five full Questions.

UNIT-1

- 1a. What is an Algorithm? Write an algorithm to find GCD of two numbers using 10
i) Euclid's method ii) Consecutive integer checking method
b. Write the formal definitions of Asymptotic Notations 6
c. Arrange the following functions according to their order of decay 4
 $\log_2 n, n, n \log_2 n, n^2, n^3, 2^n, n!$

OR

- 2 a. Give the general plan for analysing time efficiency of recursive algorithms. 12
Employ the same for Tower of Hanoi problem and derive its time efficiency
b. Write an algorithm for Binary Search method and derive its efficiency. 8

UNIT-2

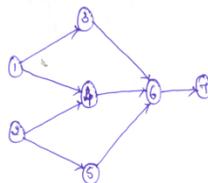
- 3 a. Write an algorithm for Brute Force string matching with an example 8
b. Write an algorithm for quick sort and discuss its best case and worst case 12
efficiencies.

OR

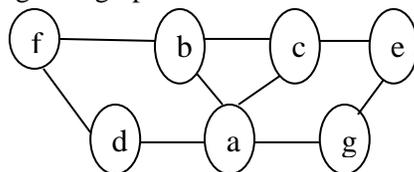
- 4a. Explain selection sort algorithm and derive its efficiency. 08
b. Discuss merge sort algorithm and its efficiency. Apply the same to sort the 12
elements { 4, 6, 1, 3, 9, 5, 2, 7 }

UNIT-3

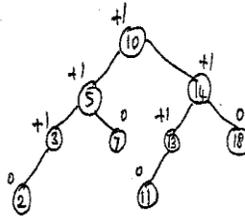
- 5 a. Write an algorithm for topological sorting and employ the same over the 10
following graph.



- b. Write an algorithm to traverse the graph using BFS method. Apply the same to 10
traverse the given graph



- 6a. Write and explain Heap sort algorithm using top-down approach. Sort the 10
elements { M, O, R, N, I, N, G } in alphabetical order.
b. What is an AVL tree? Explain the four types of rotations used to construct AVL 10
tree. Insert 1, 25, 28 and 12 in the following tree:



UNIT-4

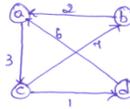
- 7 a. Write an algorithm for sorting by counting. Trace the algorithm over the list: { 6, 3, 8, 9, 1, 4, 5} 10
- b. Write Horspool's algorithm to search the pattern "BABBC" in the following BCABBBCBABBBCACB 10

OR

- 8a. Solve the following knapsack problem using dynamic programming with capacity $w=5$ 10

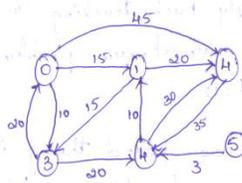
Item	1	2	3	4
Weight	2	1	3	2
Value(Rs)	12	10	20	15

- b. With the help of an algorithm, explain the Floyd's algorithm for all-pairs shortest path problem. Apply it to the following graph. 10

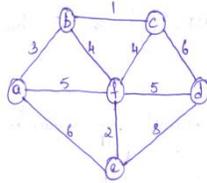


UNIT-5

- 9a. State and explain Dijkstra's algorithm to find single source shortest path. Find the shortest path and shortest distance from node 5 in the following graph. 10



- b. Define minimum spanning tree. Solve the following graph for its MST using kruskal's algorithm. 10



OR

- 10a. What is the importance of lower bound theory in algorithm analysis? Give comparison trees for linear and binary search methods. 10
- b. Write a detailed note on NP-hard and NP-complete problem with an example each 10

P.E.S COLLEGE OF ENGINEERING, MANDYA-571401
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Department of Master of Computer Applications
Model Question Paper – I
Advanced Java Programming (P15MCA42)

Credits:4

Max. Marks: 100

Time: 3 hrs

Note: Answer five full Questions.

UNIT-I

- | | | |
|------|---|----|
| 1 a) | Present your understanding about a Java Servlet. Brief about the life cycle methods of a Java Servlet | 10 |
| b) | Write the basic program format of a Java Servlet | 4 |
| c) | Compare and Contrast between doGet() and doPost() methods of Java Servlet | 6 |

OR

- | | | |
|------|--|----|
| 2 a) | Write the Client side HTML code and Server side Servlet program to Demonstrate Session Tracking | 10 |
| b) | Tabulate any three methods or properties to read HTTP header in the Servlet Program and provide description to each method | 06 |
| c) | How do you understand a Servlet Cookie? Present any three methods of Cookie with code snippet and description | 04 |

UNIT-II

- | | | |
|-----|--|----|
| 3a) | How a JSP page is different from Servlet? Write all the advantages of JSP | 05 |
| b) | List any five attributes with code syntax associated with JSP page directive and write the description to each attribute | 05 |
| c) | Write all the JSP programs required to demonstrate include directive which includes three JSP pages of content | 10 |

OR

- | | | |
|------|--|----|
| 4 a) | List any five JSP elements with basic code syntax and description to each element | 10 |
| b) | Write all the associated programs to make use of Java Bean component in JSP document | 10 |

UNIT-III

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|-----|---|----|
| 5a) | Illustrate about JDBC concept and advantages. Write the role of a JDBC driver in the JDBC program | 06 |
| b) | Write the code snippet and description about JDBC ResultSet object | 04 |
| c) | Write the complete JDBC program to demonstrate the usage of Prepared Statement object | 10 |

OR

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|------|---|----|
| 6 a) | List and write all the details of built-in annotations in Java with | 10 |
|------|---|----|

	example	
b)	Illustrate about bean methods and bean properties with code snippets	10
UNIT-IV		
7 a)	Define EJB. Write the specifications provided in EJB container services and summarize advantages of EJB file	11
b)	Classify and brief the details of EJB server side component types	09
OR		
8 a)	Why EJB is needed? Outline the prerequisites of problem domain in introducing EJB	05
b)	Brief the instance pooling/caching using all the diagrams in the EJB container services	10
c)	Tabulate any five naming conventions which includes, construct, suffix and example to describe an EJB function that ticket processing with Ticket processor term	05
UNIT-V		
9 a)	What is an EJB session bean? Classify and brief all the key points about the basic types of EJB session bean	10
b)	Name and summarize any five relationships that can exist between entity beans	10
OR		
10 a)	Compare and Contrast between the EJB session bean types	10
b)	Explain persistence entity manager mapping	04
c)	Write the complete EJB program to demonstrate the usage of EJB persistence service using the entity manager	

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Model Question Paper – I
Object Oriented Modelling and Design (P15MCA43)

Credits: 4

Max. Marks: 100

Time: 3 hrs

Note: Answer five full Questions.

UNIT-I

- 1a) Define object-orientation. Explain steps of object-orientation methodology 10
- b) Explain the following with examples and corresponding notation: 10
- i) Objects ii) classes iii) values and attributes

OR

- 2a) Explain object-oriented themes in detail 10
- b) List and explain different forms of multiple inheritances 10

UNIT-II

- 3a) Explain the following along with example 10
- i) Expanding states ii) Nested states
- b) Explain different state diagram behaviour 10

OR

- 4a) What is an event? Explain with example different kinds of events in state modelling 10
- b) List the concurrency in advanced state modelling. Explain any two with an example 10

UNIT-III

- 5a) Explain the components of activity model 10
- b) Explain the steps in constructing Domain state model 10

OR

- 6a) Explain software development process in detail 10
- b) What are the steps in constructing application class model 10

UNIT-IV

- 7a) What are the different ways subsystem can be allocated during system design 10
- b) Mention and explain steps to improve the organization of a class design 10

OR

- 8a) What are the different ways of breaking a system into subsystems? Explain 10
- b) Explain the different steps involved in designing algorithms 10

UNIT-V

- 9a) Explain the categories of pattern in detail 10
- b) Explain client-Dispatcher-Server pattern in detail 10

OR

- 10a) Explain properties of pattern 10
- b) Explain Forwarder-Receiver design pattern in detail 10

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Model Question Paper – I
Cloud Computing (P15MCA441)

Credits: 04

Max. Marks: 100

Time: 3 hrs

Note: Answer five full Questions.

UNIT – I

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|-------|--|----|
| 1. a. | Illustrate the characteristics of Network Centric Computing. | 08 |
| b. | Explain the cloud computing delivery models. | 12 |

OR

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|-------|---|----|
| 2. a. | List and explain the services provided by Amazon Web Services. | 10 |
| b. | With neat diagram, explain the architecture of Microsoft Windows Azure. | 10 |

UNIT – II

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|-------|---|----|
| 3. a. | Explain the challenges of Cloud Computing. | 10 |
| b. | Explain various categories of existing cloud applications | 10 |

OR

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|-------|-----------------------------------|----|
| 4. a. | Define workflow. Explain. | 10 |
| b. | Illustrate Map Reduce philosophy. | 10 |

UNIT – III

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|-------|--|----|
| 5. a. | What is Virtual Machine? Explain Traditional, Hybrid and Hosted virtual machine. | 14 |
| b. | Differentiate between full virtualization and paravirtualization. | 06 |

OR

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|-------|-----------------------------------|----|
| 6. a. | Explain Xen network architecture. | 10 |
| b. | Write a note on the following | 10 |
| | i) Virtual Machine Monitors. | |
| | ii) Software fault isolation. | |

UNIT – IV

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|-------|---|----|
| 7. a. | Explain the structure of an optimal controller. | 10 |
| b. | With the help of a diagram, explain two level resource allocation architecture. | 10 |

OR

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|-------|---|----|
| 8. a. | Explain the ASCA combinatorial auction algorithm. | 10 |
| b. | Explain Start-time fair queuing algorithm. | 10 |

UNIT – V

9. a. Explain the Fibre Channel frame format. 10
b. Illustrate the NFS client-server interaction. 10

OR

10. a. Explain the architecture of a GFS cluster. 10
b. Write a note on the following 10
i) Cloud Security risks.
ii) Trust.

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Model Question Paper – I
Data Warehousing and Data Mining (P15MCA453)

Credits : 04
Time : 3 hrs

Max. Marks : 100

Note: Answer any five full question

UNIT – I

1. a. What is ETL? Briefly explain the function of it? **10**
b. Explain the operations of data cube? **10**

OR

2. a. Distinguish between the following: **10**
(i) OLTP & OLAP with an example for each.
(ii) Data Warehouse and operational data base system.
b. Explain star-schema architecture of multi dimensional data model of data warehouse. Draw a fact-constellation schema of a data warehouse for sale and containing “sales” and “shipping” as fact table and time, item, shipper, branch and location as dimensional table. Assume suitable attributes for each table. **10**

UNIT – II

3. a. Explain in detail the motivating challenges for development of data mining. **10**
b. Explain the major challenges of data mining task. **5**
c. Define different attributes types with a suitable example. **5**
4. a. What is data mining? With a block diagram explain knowledge discovery in database. **10**
b. Why data preprocessing is needed and explain any two preprocessing techniques. **10**

UNIT – III

5. a. Write Apriori algorithms to generate frequent item set. **10**
b. Explain the steps involved in construction of FP-Trees. **10**
6. a. Explain the alternative methods for generating frequent item sets in detail. **6**
b. Explain the properties of objective measure. **6**
c. Explain the rule generation in Apriori Algorithm in detail. **8**

UNIT – IV

7. a. What is rule-based classifier? Explain how a rule based classifier works. **8**
b. Design a general approaches for solving a classification problem. Demonstrate with an example **12**
8. a. Explain the nearest neighbor classification technique giving its algorithm. List the characteristics. **10**
b. State and explain Bayes theorem. Explain with an example the Bayes's theorem for classification. **10**

UNIT – V

9. a. What is cluster analysis? Explain the features of cluster analysis. **10**
b. List out the types of cluster analysis methods and explain any one of it detail. **10**
- OR**
10. a. Define clustering. Briefly describe the partitioning and hierarchal clustering method with example. **10**
b. Discuss the following clustering algorithm with example. **10**
(i) K-mean (ii) DBSCAN
