

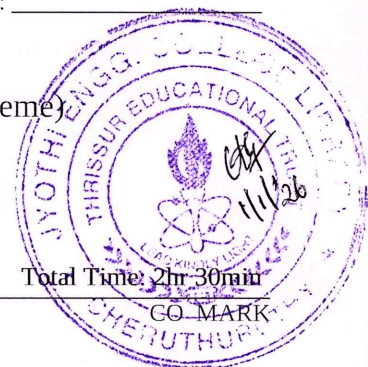
Reg No.: _____

Name : _____



Jyothi Engineering College(Autonomous)
M.Tech Degree S1 (R) Examination, December 2025 (2025 Scheme)

25PCST101- ADVANCED DATABASE MANAGEMENT



Total Mark: 60

Total Time: 2hr 30min

CO-MARK

PART A

Answer All Questions

- | | |
|---|---------|
| 1. What are the different types of hashing techniques used in database management systems? | CO1 (5) |
| 2. What are the main issues addressed by database security? | CO2 (5) |
| 3. Discuss any two data partitioning strategies in parallel database systems. | CO3 (5) |
| 4. Illustrate the possible types of failures in a distributed system. | CO4 (5) |
| 5. Using an example, highlight the factors that must be satisfied to create a well-formed XML document. | CO5 (5) |

PART B

Answer Any Five Question(s)

- | | |
|---|---------|
| 6. How is query optimization achieved during query processing? Discuss various techniques with appropriate examples. | CO1 (7) |
| 7. Consider a parallel system with shared nothing architecture. Assume that there are three processors P0, P1 and P2 with associated disks D0, D1 and D2. Assume that the records with the following keys are partitioned among the disks such that record with key, k goes to disk Di, if $k \bmod 3 = i$: 26, 16, 27, 15, 30, 18, 14, 25, 10, 9, 8, 24, 5. Assume parallel external sort merge is used to sort the records. Depict what will be the contents of the disk before sorting. Assume that the same partition vector [11, 20] is used in the merge phase. Show snapshots of data distribution after the various steps of parallel external sort merge. | CO2 (7) |
| 8. What is an SQL injection attack, and what measures can be taken to prevent it? | CO2 (7) |
| 9. How is concurrency control achieved in a distributed environment? | CO3 (7) |
| 10. Discuss any two data partitioning strategies in parallel database systems and explain Fragment-and-Replication Join in parallel database systems. | CO4 (7) |
| 11. Differentiate between nearness query and region query. Consider a query to find all the restaurants within the geographic boundaries of a given town. Analyse if this query could be categorized as a nearness query or a region query and explain why? | CO5 (7) |

12. Following is a sample XML document (textiles.xml) containing the records of a textile shop.

```
<?xml version="1.0" encoding="UTF-8"?>
<textiles>
<dress category="saree">
<brand>SS</brand >
<fabric>Linen</fabric >
<price>3000</price>
</dress>
<dress category="frock">
<brand>Zara</brand >
<fabric>Cotton</fabric >
<price>9000</price>
</dress>
<dress category="shirt">
<brand>LP</brand >
<fabric>Linen</fabric >
<price>5000</price>
</dress>
</textiles>
```

CO5 (7)

a) Write the XPath to select all the brand names of the dress element of the textile shop AND all the price elements in the document.

b) Write an XQuery to get the category elements of those XML nodes where the fabric is 'Linen'.

c) Predict the output of the following query.

```
let $dress := (doc("textiles.xml")/textiles/dress)
return <results>
{
for $x in $textiles
where $x/price>4000
order by $x/price
return $x/category
}
```
