Reg. No.												

Question Paper Code	11053

Sri SAI RAM INSTITUTE OF TECHNOLOGY

An Autonomous Institution | Affiliated to Anna University & Approved by AICTE, New Delhi

Accredited by NBA and NAAC "A+" | An ISO 9001:2015 Certified and MHRD NIRF ranked institution

Sai Leo Nagar, West Tambaram, Chennai - 600 044. www.sairamit.edu.in

B.E / B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2021

Fourth Semester

COMPUTER SCIENCE AND ENGINEERING

(Common to Information Technology)

CS8492 - DATABASE MANAGEMENT SYSTEMS

(Regulation - 2017)

Duration: 3 Hours | Max. Marks 100

Answer ALL Questions

PART-A (10 × 2 = 20 Marks)

1.	Define Physical level and logical level data independence.	K2	CO1
2.	What is Foreign Key? Give an example.	K2	CO1
3.	Define Functional Dependency.	K2	CO2
4.	Suppose that we have the following three tuples in a legal instance of a relation schema S with four attributes WXYZ (listed in order): (1, 2, 3, 4), (5, 2, 3, 4), (6, 4, 3, 5) Which of the following dependencies can you infer does not hold over the schema S? State your reasoning. a) W → Y b) XZ → W c) Y → Z d) WX → Z	K3,K4	CO2
5.	Brief about Cascading Rollback with an example.	K3	CO3
6.	List the different Isolation Levels.	K2	CO3
7.	What are the factors to be taken into account when choosing a RAID level?	K2	CO5
8.	Write the components of Query Cost Estimation.	K1	CO4
9.	Comment on Interface and Literal of ODMG Object Model	K2	CO6
10.	List the characteristics of IR.	K1	CO4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 - Create

PART – B (5 × 13 = 65 marks)

11. a) Describe Database System Structure in detail with neat diagram. 13 K1,K2 CO1

OR

b) Consider that, Notown Records has decided to store information about musicians who perform on its albums (as well as other company data) in a database. The company has wisely chosen to hire you as a database designer.

Each musician that records at Notown has an SSN, a name, an address, and a phone number. Poorly paid musicians often share the same address, and no address has more than one phone.

- Each instrument used in songs recorded at Notown has a unique identification number, a name (e.g., guitar, synthesizer, and flute) and a musical key (e.g., C, B-flat, and Eflat).
- Each album recorded on the Notown label has a unique identification number, a title, a copyright date, a format (e.g., CD or MC), and an album identifier.
- Each song recorded at Notown has a title and an author.
- Each musician may play several instruments, and a given instrument may be played by several musicians.
- Each album has a number of songs on it, but no song may appear on more than one album.
- Each song is performed by one or more musicians, and a musician may perform a number of songs.
- Each album has exactly one musician who acts as its producer. A musician may produce several albums, of course.

Design a conceptual schema for Notown and draw an ER diagram for the schema. The preceding information describes the situation that the Notown database must model. Be sure to indicate all key and cardinality constraints and any assumptions you make. 13 K3,K4, K6 CO1

12. a) Explain i) BCNF 5 K2 CO2

ii) Multivalued Dependency & 4NF 8 K2 CO2

OR

b) Perform 1NF, 2NF and 3NF for the given order form application. 13 K3,K4, K6 CO2

Order Form			
Order number: 1234 Customer number: 777 Customer name: Ganesan Customer address: Chennai		Date : 1/7/2021	
Product No	Description	Quantity	Unit Price
P10	Fan	10	Rs.1500
P11	Light	12	Rs.160
P12	Chair	50	Rs.500

13.	a)	Explain the need for concurrency control and 2PL in detail with suitable examples.	13	K2,K3	CO3
		OR			
	b)	Elaborate Deadlock Detection and Prevention techniques.	13	K2,K3	CO3
14.	a)	Describe the Retrieval models of IR systems.	13	K2	CO4
		OR			
	b)	Describe the basic steps of query processing in detail with neat diagram.	13	K2	CO4
15.	a)	Elucidate Indexing in detail with suitable examples.	13	K2	CO5
		OR			
	b)	Write short notes on Distributed Database Architecture, Data Storage and Transaction processing.	13	K2	CO6

PART C (1 × 15 = 15)

16. a) (i) Consider the following relational schemas of the Employee database

Employee(ename,city,street)
Works(ename,companyname,salary)
Company(companyname,city)
Manages(ename,mname)

Write query in SQL.

a) Find the names of all employees who work for the 'fbc'.
b) Find the names of all employees who earn more than every employee of 'sbc'.
c) Find the names of all employees who do not have manager.
d) Find the names of all employees whose first letter is 'a'.
e) Delete the record of employee 'john'.
f) Display the details of all employees in a sorted order.
g) Find the names of all employees who are living in Chennai.
h) Find the names of all employees who are not living in Bangalore and Hyderabad.
i) Increment the salary of 'bbc' employees with Rs.1000.
j) Add a new column manager_no into the Manages relation.

10 | K3, K4, K5 | CO1, CO5

(ii) Create B^+ tree to insert the following key values (the order of tree is three): 32, 11, 15, 13, 7, 22, 15, 44, 67, 4. — 5

OR

b) Construct the XML: Hierarchical tree model, XML DTD and XML Schema for the below given XML Document. Assume topic element has one or more occurrence and book element has zero or more occurrence. 15 K6 CO6

```
<bookstore>
 <name>Vinay Store</name>
 <topic>
  <name>XML</name>
  <book isbn="123-456-789">
   <title>Database Management Systems<</title>
   <author>Parimel</author>
  </book>
 </topic>
</bookstore>
```