

**III B. Tech I Semester Supplementary Examinations, February-2022**  
**DATABASE MANAGEMENT SYSTEMS**

(Common to Computer Science and Engineering, Information Technology)  
 Time: 3 hours Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

**(22 Marks)**

1. a) What are the responsibilities of the DBA and the database designers? [3M]
- b) Define the following terms: relation schema, relational database schema, domain, attribute. [4M]
- c) Explain the differences among an entity, an entity type, and an entity set. [4M]
- d) Explain the concept of lossless join decomposition. [4M]
- e) List the ACID properties. [4M]
- f) How does a B-tree differ from a B+-tree? [3M]

**PART -B**

**(48 Marks)**

2. a) Compare and Contrast file Systems with database system? [8M]
- b) Demonstrate Centralized and Client-Server Architecture for DBMSs. [8M]
3. a) What is a foreign key constraint? Why are such constraints important? What is referential integrity [8M]
- b) **EMPLOYEE** [8M]

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

Write SQL statements to create a table EMPLOYEE\_BACKUP to back up the EMPLOYEE table.

4. a) Discuss user-defined and predicate-defined subclasses and identify the differences between the two. [8M]

- b) Consider the SAILOR DATABASE [8M]  
Sailors (sid:string, sname:string, rating:integer, age:real)  
Boats (bid:integer, bname:string, color:string)  
Reserves (sid:integer, bid:integer, day:date)  
Based on the above schemas answer the following queries.  
Based on the above schema, write the corresponding SQL queries for the following:
- (i) Find the colors of boats reserved by 'Lubber'.
  - (ii) Find the names of sailors who have reserved at least one boat
  - (iii) Find the names of sailors who have reserved a red or green boat
  - (iv) Find the names of the sailors who have reserved both a Red boat and a Green boat.
  - (v) Find names of sailors who have reserved all boats
5. a) Explain 1NF and 2 NF with appropriate examples. [8M]  
b) Explain the concept of surrogate key. [8M]
6. a) Explain Wait/Die and Wound/Wait Schemes in transaction management. [8M]  
b) What is a trigger? How to create it? Discuss various types of triggers. [8M]
7. a) How does multilevel indexing improve the efficiency of searching an index file? [8M]  
b) What is the order p of a B-tree? Describe the structure of B-tree nodes. [8M]

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