Roll Number:_____	
Thapar Institute of Engineering and Technology Patiala	
Computer Science and Engineering Department **Mid Sem Test**	
BE Second Year (4th Semester) 05 April, 2022	**UCS310: Database Management System**
Time: 2 Hours, Max Marks:35	**Coordinaors: Dr Geeta Kasana, Dr.Anshu Parashar**
Instructors: Geeta Kasana, Anshu Parashar Sanjeev Rao, Sumana Maiti, Rajendra Roul, Varun Srivastav, Hemant Gianey, Manisha Kaushal, Diwakar Tripati	

Note: Attempt any five questions. All parts of a question must be answered in order. A new question must start from new page. First five attempted questions will be considered.

Q1.	a) Consider a scenario, where a bank customer was withdrawing an amount of 500 INR from his account using an ATM kiosk and suddenly due to power failure the ATM machine was unable to dispense the cash; however, the amount got deducted from his account. Later the transaction got reversed and the amount got credited back to his account. Which functionality of a DBMS is responsible for this reversal without any human intervention? Will a file system be able to implement the same? Justify your view in terms of consistency, data integrity & complexity. b) Which component of a DBMS architecture stores metadata about data? What is the functionality of this component?	5+2
Q 2	a) Consider an IT company that wants automate functioning of ABC Bank. List all the key issues that need to be well-thought-out while moving from traditional file-based systems to modern database management system? Justify your view in terms of consistency, data integrity & complexity. b) Explain three- schema architecture with diagram.	4+3
Q 3	a) Design an ER-diagram with following instructions; **Make sure cardinalities and primary keys are clear.** • Every school has many students and many teachers. Each student has following attributes; code, name, address, phone-no, and dob. Each student is assigned to one school and each teacher works for one school only. School has following attributes: code, name, address, phone • Each teacher can teach more than one subject and subject will be taught by one or more than one teacher. Subject characterized by following attributes such as subject_tid, type. • Teacher characterized by following attributes such as name, qualification, dob, tid. • Every student can study more than one student. b) What are the two integrity rules? Explain with examples how these rules are important to enforce consistent database states.	5+2
Q 4	a) Discuss the difference/s between following terms with example/SQL syntax i) Primary key and Unique key ii) Drop and Truncate iii) On Delete Set null and On Delete Set Cascade iv) Inner and outer Join v) Composite and Multivalued attributes b) Write a SQL sub query using given employee schema to find those employees who earn less than the average salary and work in a department with any employee whose last_name not contains a character 'n'. **Emp**{Emp_id,First_name,Last_name,Hire_date,Job_id,Salary,Department_id}	5+2

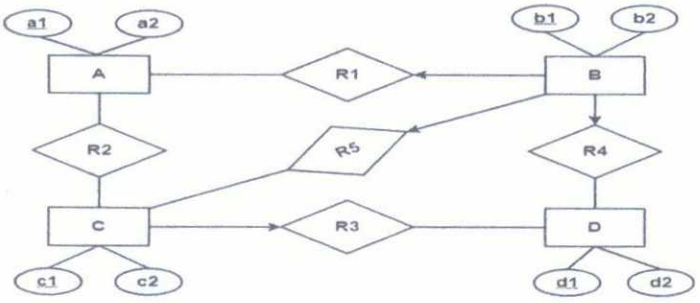
PTO

1/2

Q5 — 3+4

a) Differentiate between the Generalization and Specialization with suitable examples.

b) Convert the following E-R diagram to Tables. Explicitly mention primary and foreign key for each table:



Q6 — 2+2+3

a) If **R(A,B,C,D,E)** with following functional dependencies

AB →CDE, C →BD

i. identify candidate key/s of Relation.

ii. identify prime and non-prime attributes of Relation R.

b) If a relation schema **R (U, V, X, Y, Z)** with following set F of functional dependencies:

$U \rightarrow VX$, $XY \rightarrow Z$, $V \rightarrow Y$, $Z \rightarrow U$

i. identify candidate key/s of Relation.

ii. identify prime and non-prime attributes of Relation R.

c) Discuss the difference between trivial and non-trivial dependencies with example.

Q7 — 7

Consider following three relations: **PHYSICIAN, PATIENT** and **VISITS.** Write a SQL Queries for the given queries using these three relations

PHYSICIAN

Name	Null?	Type
PH_REGNO(PK)	NOT NULL	VARCHAR2(5)
PH_NAME	NOT NULL	VARCHAR2(15)
PH_ADD	NOT NULL	VARCHAR2(20)
PH_TELNO		NUMBER(9)

VISITS

Name	Null?	Type
PH_REGNO(FK)		VARCHAR2(5)
PT_ID(FK)		NUMBER(5)
DATE_OF_VISIT		DATE
FEESCHARGED		NUMBER(5)

PATIENT

Name	Null?	Type
PT_ID(PK)	NOT NULL	NUMBER(5)
PT_NAME		VARCHAR2(15)
PT_ADD	NOT NULL	VARCHAR2(20)

i. Display the physician's name whose name starts with character A.

ii. Write a query to change the name of the column feescharged of visits table as Fees_Paid

iii. Calculate the total fees obtained by the physicians. Also print the registration number, name of the physician.

iv. Display the name of the Physician whose fees charged is highest

v. Display the name of the physicians with their telephone numbers whom has been visited by only one patient.

vi. Find the names of the patients and their addresses who have visited to more than one physician

vii. Find the registration number and name of the physician with their patient count