

Roll Number: _____

Thapar Institute of Engineering and Technology (TIET), Patiala
Department of Electrical and Instrumentation Engineering

B.Tech. (EIC) (2022-23) EST	Course Code: UCS312
	Course Name: Database Management System
May 15, 2023	Monday, 02:00 PM - 05:00 PM
Time: 03 Hrs Max. Marks: 45	Name of Faculty: Dr. Rakesh Kr. Yadav

Note: All questions are compulsory. All parts of a question should be attempted in one place.

- Q. 1** State the Armstrong inference rules. Provide suitable examples to describe each. [5]
- Q. 2** Write Short Notes on (mention explain for each) [10]
- a) Aggregation Function
 - b) Views of DBMS
 - c) Normalization
 - d) Extended Features of Entity Relation Diagram
 - e) States of a Transaction
- Q. 3** Check whether the given schedule S is conflict serializable or not. If yes, then determine all the possible serialized schedules [5]

T1	T2	T3	T4
	R(A)		R(A)
W(B)	W(A)	R(A)	
	W(B)	R(B)	

- Q. 4** Write a PL/SQL block to create a procedure that takes two parameters - a department name and a salary increment value. The procedure should update the salary of all employees in the specified department by adding the increment value to their current salary. If the increment value is negative, the salary should be decremented instead. If the department name is not valid, the procedure should raise an exception with an appropriate error message. [5]
- Q. 5** Explain the concept of transaction management in DBMS. What are the ACID properties of a transaction? Describe each property in detail with an example. [5]
- Q. 6** Given a relation schema R and two functional dependency sets F1 and F2. [5]
- R=(A,B,C,D,E,F)
- F1={A → BC, B → CDE, AE → F}
- F2={A → BCF, B → DE, E → AB}
- Check whether F1 and F2 are equivalent or not.
- Q. 7** Given a relation R and FD set. Answer the following [5]
- a) Find the Candidate key(s)
 - b) Normalize the R to 2NF, 3NF and BCNF
- R=(A,B,C,D,E,F,H,I,J)
- F1={AB → C, B → D, D → EF, A → GH, H → IJ}
- Q. 8** What is a two-phase locking protocol? List the salient features of strict two-phase locking protocol. Explain with a suitable example how cascading rollbacks can be avoided using strict two-phase locking. [5]