Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2023

Course: Data Management **Semester : II**
Program: MBA BA KPMG **Time : 03 hrs.**
Course Code: DSBA 7004 **Max. Marks: 100**

Instructions: Attempt all sections

SECTION A
10Qx2M=20Marks

S. No.		Marks	CO
Q 1	Attempt all multiple choice questions		**CO1**
A.	Which of the following is a function of the DBMS? a) Storing data b) Providing multi-users access control c) Data Integrity d) All of the above	**2**	**CO1**
B.	The ability to query data, as well as insert, delete, and alter tuples, is offered by _____ a) TCL (Transaction Control Language) b) DCL (Data Control Language) c) DDL (Data Definition Langauge) d) DML (Data Manipulation Langauge)	**2**	**CO1**
C.	Which of the following command is correct to delete the values in the relation **teaches**? a) Delete from teaches; b) Delete from teaches where Id =’Null’; c) Remove table teaches; d) Drop table teaches;	**2**	**CO1**
D.	In the _____ normal form, a multivalued attribute is converted to individual attributes. a) 1NF b) 2NF c) 3NF d) BCNF	**2**	**CO1**
E.	Which of the following is not Armstrong’s Axiom? a) Reflexivity rule b) Transitivity rule c) Pseudotransitivity rule d) Augmentation rule.	**2**	**CO2**

F.	The relation employee(ID, name, street, Credit, street, city, salary) is decomposed into employee1 (ID, name) employee2 (name, street, city, salary) Now thus decomposition: a) Satisfies 2NF b) Satisfies 3NF c) Satisfies BCNF d) None of the above	**2**	**CO2**
G.	____ means that the data used during the execution of a transaction cannot be used by a second transaction until the first one is completed. a) Consistency b) Atomicity c) Durability d) Isolation	**2**	**CO2**
H.	I and J are _____ if they are operations by different transactions on the same data item, and at least one of them is a write operation a) Conflicting b) Overwriting c) Isolated d) Durable	**2**	**CO2**
I.	Which of the following protocols ensures conflict serializability and safety from deadlocks? a) Two-phase locking protocol b) Time-stamp ordering protocol c) Graph based protocol d) None of the mentioned	**2**	**CO2**
J.	State true or false: If I = read(Q) and J = read(Q) then the order of I and J does not matter. a) True b) False	**2**	**CO1**
SECTION B **4Qx5M= 20 Marks**			
Q2.	What are the main characteristics of the database approach and how it differs from traditional file?	**5**	**CO2**
Q3.	What is an entity type? What is an entity set? Explain the differences among an entity, an entity type, and an entity set.	**5**	**CO1**
Q4.	What is a functional dependency? Why can we not infer a functional dependency from a particular relation state?	**5**	**CO2**

Q5.	What is meant by the concurrent execution of database transactions in a multiuser system? Discuss how serializability is used to enforce concurrency control in a database system.	**5**	**CO1**
SECTION-C **3Qx10M=30 Marks**			
Q6.	Discuss insertion, deletion, and modification anomalies. Why are they considered bad? Illustrate with examples.	**10**	**CO2**
Q7.	Draw a state diagram, and discuss the typical states that a transaction goes through during execution.	**10**	**CO2**
Q8.	A. What is the two-phase locking protocol? How does it guarantee serializability? What are some variations of the two-phase locking protocol? OR A. Consider a relation schema S = {U, V, W, X, Y, Z} with a set of FDs F = {U→V, VW→X, Y→W, X→U} Find all the candidate keys of S	**10**	**CO2**
SECTION-D **2Qx15M= 30 Marks**			
Q9.	Check whether the given schedule S is conflict serializable and recoverable or not. **R2(X); W3(X);C3;W1(X);C1;W2(Y);R2(Z);C2;R4(X);R4(Y);C4**	**15**	**CO3**
Q10.	Consider the following relation: CAR_SALE (Car num, Date_sold, Salesman num, Commission%, Discount_amt) Assume that a car may be sold by multiple salesmen and hence {Car num, Salesman num} is the primary key. Additional dependencies are: Date_sold → Discount_amt Salesman num → Commission% Answer the following questions: a. What normal form is the relation in? Explain your answer. b. Apply normalization until you cannot decompose the relations further. State the reasons behind each decomposition.	**15**	**CO3**