Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

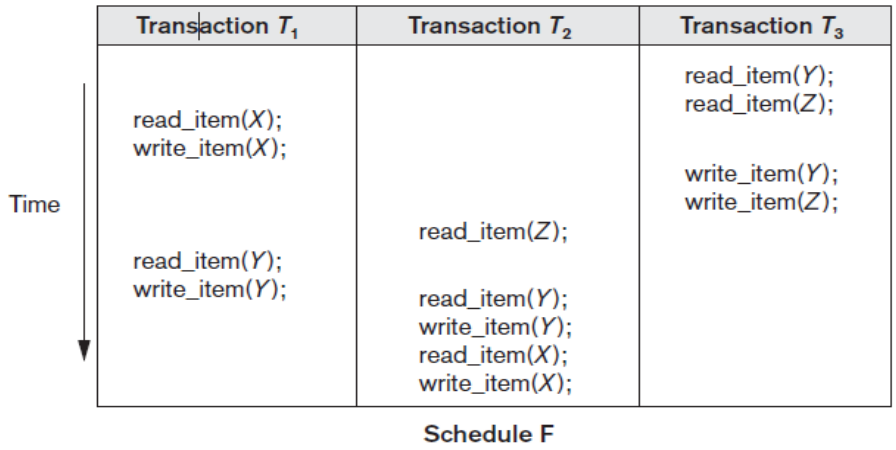
Course: Advanced Database Management System
Semester: IV
Program: B.Tech. (CSE) with Spl. GG, AI &ML, DEVOPS, CSF, BDATA, CCVT **Time: 03 hrs.**
Course Code: CSEG2005 **Max. Marks: 100**

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q. 1	List four significant differences between a file-processing system and a DBMS.	**4M**	**CO1**
Q. 2	Differentiate between the dense index and sparse index.	**4M**	**CO2**
Q. 3	Explain DDL and DML commands with suitable examples.	**4M**	**CO3**
Q. 4	Consider a relation schema R(X Y Z W P) is decomposed into R1(X Y) and R2 (Z W). Determine, whether the above R1 and R2 are Lossless or Lossy?	**4M**	**CO4**
Q. 5	Explain ACID properties of a transaction.	**4M**	**CO5**

SECTION B
(4Qx10M= 40 Marks)

Q.6	i. In order to perform a sequential search on ordered and unordered records the average number of blocks that require searching is b/2 where b is the total number of blocks. Justify with suitable example. On ordered records the search operation can be made efficient by using a different algorithm. Discuss the algorithm and justify why is this a better approach? ii. Construct B+ tree for the following elements with order=3 5, 15, 25, 30, 45, 60, 18, 28	**4M** **6M**	**CO2**
Q.7	A. Write Relational Algebra queries for the following schema: Instructor (ID, name, dept_name, salary) Teaches (ID, course_id, sec_id, semester, year) Course (course_id, Title, Fee, credits) I. Find the names of all instructors together with the course id of all courses they taught. II. Find the names of all instructors in the Physics department together with the course id of all courses they taught. III. Find the names of all instructors in the Comp. Sci. department together with the course titles of all the courses that the instructors teach. B. Convert following SQL in to relational algebra:	**2M** **2M** **2M**	**CO3**

	i. SELECT movieTitle FROM StarsIn, MovieStar WHERE starName = name AND birthdate = 1960 ii. (SELECT name, address from MovieStar) EXCEPT (SELECT name, address from MovieExec)	**2M** **2M**	
Q.8	i. Explain different types of anomalies with suitable example. ii. Given a relation R (A, B, C, D) and Functional Dependency set FD = {AB → CD, B → C}, determine whether the given R is in 2NF?	**5M** **5M**	**CO4**
Q.9	i. Illustrate the structure of distributed database and discuss the various types of data fragmentation schemes. (OR) ii. Discuss the various type constructors used in Object Oriented database. Explain what primary characteristics an OID should possess.	**10M**	**CO6**
	SECTION-C **(2Qx20M=40 Marks)**		
Q.10	i. Explain, what is a schedule? Define the concepts of recoverable, cascade less, and strict schedules, and compare them in terms of their recoverability. ii. Check, given schedule F is serializable schedule or not. If yes, determine the equivalent serial schedules.  Schedule F	**10M** **10M**	**CO5**
Q. 11	i. Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. ii. If, no attribute has the capability to become a primary key in a relation, how you will ensure entity integrity constraint? Explain with suitable example and write SQL query for ensuring it. (OR) iii. Compare Following (with suitable example): a. Primary key and Unique key b. Multivalued attribute and Composite attribute iv. Describe three–schema architecture and explain the role of physical data independence and logical data independence.	**10M** **10M** **8M** **12M**	**CO1**