

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

ROORKEE – 247667

Database Management Systems (CSN-351)

Sheet: 4

Total Marks: 100

Instructions:

- The deadline for assignment submission is **6 November till 11:59 PM**.
- If there is any similarity between the two students' submissions, both will be awarded **zero marks**. So, it's the student's responsibility not to share the submission with other students.
- Each late submission will receive a 15% penalty per day for up to 2 days. No submission will be accepted after the 2nd late day.
- You must **handwrite** your solutions; please scan the hard copy and convert it into a PDF with your name and enrolment number. Your name and roll number should be clearly written on the top of the first page.
- Please do not email us your submissions.
- Your submission must be uploaded to the Microsoft team.
- Also, Make sure that you are uploading the **correct file**. Please double-check your submitted file, and update your submission if required. We are not responsible if you get zero or fewer marks for uploading the wrong/older file.

Que. 1: List the ACID properties. Explain the usefulness of each.

[10 Marks]

Que. 2: Explain each of the following with examples:

- a) Lost updation problem (W-W conflict)
- b) Dirty read problem (W-R conflict)
- c) Unrepeatable problem (R-W conflict)
- d) Non recoverable schedule
- e) Recoverable schedule
- f) Cascading rollbacks (or Cascading aborts)
- g) Cascade less schedule
- h) Strict schedule
- i) Blind write
- j) Serial schedule

[30 Marks]

Que. 3: What is Serializability? Explain various types of Serializability with examples. Check whether the schedule given below is conflict serializable or not? If so, write the serializable order.

T1	T2	T3
Read(x)		
		Read(x)
Write(x)		
	Read(x)	
	Write(x)	

[20 Marks]

Que.4: What benefit does strict two-phase locking provide? What disadvantages result?

[10 Marks]

Que.5: Explain the Two-phase locking protocol and Timestamp-based protocol with examples.

[15 Marks]

Que 6: Show that there are schedules that are possible under the two-phase locking protocol, but are not possible under the timestamp protocol, and vice versa.

[15 Marks]