Total No. of Questions – [06] Total No. of Printed Pages: 2

G.R. No.	

DECEMBER 2021 - ENDSEM EXAM

T. Y. B. TECH. (INFORMATION TECHNOLOGY) (SEMESTER - I)

COURSE NAME: DATABASE MANAGEMENT SYSTEM

COURSE CODE: ITUA31181

(PATTERN 2018)

Time: [1 Hour] [Max. Marks: 30]

Instructions to candidates:

1) **Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1) a) Elaborate the Recoverable Schedules and Cascadeless Schedules with example. [4]

b) Assume the following two transactions:

```
T31: read(A);
     read(B);
     if A = 0 then B := B + 1;
     write(B).
T32: read(B);
     read(A);
     if B = 0 then A := A + 1;
     write(A).
```

Add lock and unlock instructions to transactions T31 and T32, so that they observe the two-phase locking protocol. Can the execution of these transactions result in a deadlock? [6]

OR

Q.2) a) Identify the benefit of strict two-phase locking provide? And it's disadvantages? [4]

b) Determine that following schedule is conflict serializable or not. [6]

T1	T2
read(A)	
write(A)	
	read(A)
	write(A)
read(B)	
write(B)	
	read(B)
	write(B)

Q.3) a) Explain the lock de-escalation, and under what conditions is it required? Why is it not required? if the unit of data shipping is an item? [4]

b) Examine the system structure of a distributed database and write the responsibilities of transaction manager and transaction coordinator. [6]

OR

Q.4) a) Assume a bank that has a collection of sites, each running a database system. Suppose the only way the databases interact is by electronic transfer of money between one another. Would such a system qualify as a distributed database? Why? [4]

b) Analyze Parallel Database Architectures with advantages and disadvantages of each. [6]

Q.5) a) Distinguish between SQL and NoSQL database. [4]

b) Analyze HDFS architecture and function of each component. [6]

OR

Q.6) a) Elaborate the CAP theorem and BASE theorem properties. [4]

b) Analyze Map Reduce concept with example. [6]