PRN No. |

PAPER CODE | U313-2102-E4E

DECEMBER 2023 (ENDSEM) EXAM
TY (INFORMATION TECHNOLOGY) (SEMESTER - I)
COURSE NAME: DATABASE MANAGEMENT SYSTEMS
COURSE CODE: ITUA31202
(PATTERN 2020)

Time: [1Hr. 30 Min]   **[Max. Marks: 40]**

Instructions to candidates:
1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data wherever required**
4) **All questions are compulsory. Solve any one sub question from Question 3 and any two sub questions each from Questions 4,5 and 6 respectively.**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Describe the differences in meaning between the terms relation and relation schema.	[2]	1	2
Q2	a)Consider the following schema: employee (employee-name, street, city) works (employee-name, company-name, salary) company (company-name, city) manages (employee-name, manager-name) a)Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000.	[2]	2	4
Q3.	a)Given relational schema R(P Q R S T U V) having following attribute P Q R S T U and V, also there is a set of functional dependency denoted by FD = { P->Q, QR->ST, PTV->V }. Determine Closure of (QR)+ and (PR)+	[6]	3	5
	b) Explain 4NF and 5NF normal form with example	[6]	3	3
Q.4	a) Database-system implementers have paid much more attention to the ACID properties than have file-system implementers. Why might this be the case?	[5]	4	4
	b) Justify the following statement: Concurrent execution of transactions is more important when data must be fetched from (slow) disk or when transactions are long, and is less	[5]	4	4

	important when data is in memory and transactions are very short.			
	c) What is a cascadeless schedule? Why is cascadeless-ness of schedules desirable? Are there any circumstances under which it would be desirable to allow non-cascadeless schedules? Explain your answer.	[5]	4	4
Q.5	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?	[5]	5	4
	b)What factors could result in skew when a relation is partitioned on one of its attributes by: a. Hash partitioning b. Range partitioning In each case, what can be done to reduce the skew?	[5]	5	4
	c)For each of the three partitioning techniques, namely round-robin, hash partitioning, and range partitioning, give an example of a query for which that partitioning technique would provide the fastest response.	[5]	5	3
Q.6)	a)Explain characteristics of Big Data and it's applications	[5]	6	3
	b)Comparison SQL and NOSQL based on advantages and disadvantages	[5]	6	3
	c)Explain MapReduce with example	[5]	6	2