JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Supplementary Examination- 2026

B.Tech-III Semester (CSE/IT)

COURSE CODE(CREDITS):25B11CI313 (3) MAX. MARKS: 75

COURSE NAME: DATABASE MANAGEMENT SYSTEMS

COURSE INSTRUCTORS: {Pardeep, Amol, Ekta, Nitika, Gaurav, Pankaj} MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	Consider the following student relation: Roll-No | Name | Course 1 | Ram | C/Rust 2 | Shyam | Python 3 | John | C/Rust (i) What is the current normal form of student relation? (ii) Write three possible solutions to covert the student table into immediate next higher normal form. Write the resultant tables.	1	8
Q2	Consider the relation R(A,B,C,D,E,F) and Functional dependency set: {AB→C, C→DE, E→F, D→A, C→B}. Find the highest normal form in relation R.	4	8
Q3	Consider the relation R(A,B,C,D,E) and functional dependency set F:{ A→BCD, B→AE, BC→AED, D→E, C→DE}. Let the back end engineer decompose R into R1(AB), R2 (BC) and r3 (CSE). Check the decompositron for dependency preserving and lossless join.	4	10
Q4	Consider the relation R(A,B,C,D) and Functional dependency set F: { A→B, C→D}. What is the highest normal form of the given relation R? Convert the relation R into its immediate next higher normal form.	4	10
Q5	Consider the schedule S of transactions T1 and T2: T1: Lock S(A); Lock X(B); Unlock (A); Unlock (B) T2: Lock X(A); Lock X(D); Unlock (A); Unlock (D)	5	10

	Apply the two phase locking protocol (2 PL) and show the resultant schedule S_1. Also find the serial schedule corresponding to S_1.		
Q6	Consider the schedule of transactions S given as under: Apply basic time stamp ordering protocol on S and show the transactions execution.	5	10
Q7	Consider the set of transactions along with data items given as under: Draw the weight for graph for the above set of transactions. Is there a deadlock?	5	10
Q8	Consider the student table as shown below: (i) What kind of anomaly the table is suffering from? (ii) Identify and write the anomalies cases with the help of above tables in support of your answer by considering insertion, deletion and updating anomalies. Suggest the possible solution to get rid of anomalies answered by you in part (i) question's answer.	2	9

T1 (TS:400)	T2(TS: 500)	T3 (TS: 600)
R(A)		
	R(B)	
W(C)		
		R(B)
R(C)		
	W(B)	
		W(A)

Transactions	Data Items	Locks
T1	Q	Exclusive
T2	P,Q	Exclusive
T3	Q	Exclusive
T4	P	Exclusive
T5	R	Exclusive
T6	R, Q	Exclusive
T7	P, R	Exclusive

Sid	Sname	Cid	Cname	Fid	Fname	Salary
1	Ram	C1	DBMS	F1	John	30K
2	Ravi	C2	Java	F2	Bob	40K
3	Nitin	C1	DBMS	F1	John	30K
4	Amit	C1	DBMS	F1	John	30K