School of Engineering
Second Sessional Examination, Even Semester (AS: 2023-24)

B. Tech: CSE/IOTBC/CCML [Year: 2nd] [Semester: 4th]

Course Title: Database Management Systems	Max Marks: 60
Course Code: BCS3401	Time: 3hrs

Instructions if any: Read the question Carefully.

SECTION 'A'	Course Objective	Marks
Q.N.1. Attempt all parts of the following:		
a) What is the significance of Physical Data Independence?	CO1	1
b) What do you understand by Functional Dependency in DBMS?	CO1	1
c) Explain Blind Write in Transactions.	CO2	1
d) What is Normalization?	CO2	1
e) Define schedule?	CO2	1
f) What is the concept of Roll Back in Transaction?	CO5	1
g) What is Equi-Join in database?	CO2	1
h) List the four functions of DBA.	CO4	1

SECTION 'B'	Course Objective	Marks
Q.N.2. Attempt any two parts of the following:		
a) What are data models? Briefly explain its types.	CO1	6
b) Draw the ER-Diagram for Hospital Management System?	CO4	6
c) Check whether the given schedule S is conflict serializable or not-S : R1(A) , R2(A) , R1(B) , R2(B) , R3(B) , W1(A) , W2(B)	CO5	6
d) Discuss about Transaction. Also explain properties and states of transaction.	CO5	6

SECTION 'C'	Course Objective	Marks
Q.N.3. Attempt any two parts of the following:		
a) Discuss about Extended features of E-R diagram with example.	CO2	5
b) Explain data abstraction in DBMS?	CO5	5
c) What are relational constraints? Explain keys associated with them.	CO3	5

Q.N.4. Attempt any two parts of the following:

a)	Given the following set of FDs on schema R (V,W,X,Y,Z) {Z→V, W→Y, XY→Z, V→WX} state whether, the following decomposition are loss-less join decompositions or not. (i) R1=(V,W,X), R2=(V,Y,Z) (ii) R1=(V,W,X), R2=(X,Y,Z)	CO4	5
b)	What is Aggregate Function in SQL? Write SQL query for different Aggregate Function.	CO2	5
c)	A set of FDs for the relation R{A, B, C, D, E, F} is AB →C, C → A, BC → D,ACD → B, BE → C, EC → FA, CF → BD, D→ E. Find a minimum cover forth is set of FDs	CO4	5

Q.N.5. Attempt any two parts of the following:

a)	Explain about Trigger with suitable example.	CO2	5
b)	What is a schedule? Define the concepts of recoverable and cascade less schedule.	CO5	5
c)	Discuss log based recovery process? Briefly	CO5	5

Q.N.6. Attempt any two parts of the following:

a)	Discuss 2 phase locking protocol and time stamp based protocol with suitable example.	CO5	5
b)	Consider the relation R(a,b,c,d) with Set F={a→c,b→d}. Decompose this relation in 2 NF.	CO4	5
c)	Consider the following schema for institute library: Student (RollNo, Name, Father_ Name, Branch) Book (ISBN, Title, Author, Publisher) Issue (RollNo, ISBN, Date-of –Issue) Write the following queries in SQL and relational algebra: (i) List roll number and name of all students of the branch 'CSE'. (ii) Find the name of student who has issued a book published by 'ABC' publisher. (iii) List title of all books and their authors issued to a student 'RAM'.	CO4	5

Table 1: Mapping between COs and questions
(Number of COs may vary from course to course)

COs	Questions Numbers	Total Marks
CO1	1(a,b),2(a)	8
CO2	1(c,d,e),3(a),4(c),6(a)	19
CO3	3(c)	5
CO4	1(h), 2(b),4(a,c),6(b,c)	27
CO5	1(f),2(c,d),3(b),5(b,c),6(a)	32