Department of Computer Science and Engineering
Course no: CSE 3101, CT-1, Time: 20 mins

1. Draw an ER diagram with appropriate cardinalities that includes Teacher, Student and Course with constraints i) each teacher can take any number of course ii) a student can register one or more course iii) a course can have at most one Teacher. 12
2. Describe a concurrent-access anomalies scenario while transferring the fund of 150$ from a bank account A to another account B having 400$ and 1000$ respectively. 8

Department of Computer Science and Engineering

Course no: CSE 3101, Time: 20 mins

1. Consider the following schemas 12

   Customers(customer_id cust_name city grade salesman_id)

   Orders(ord_no purch_amt ord_date customer_id salesman_id)

   vii) Write a SQL statement to make a list with order no, purchase amount, customer name and their cities for those orders which order amount between 500 and 2000.

   viii) Write a SQL statement to know which salesman are working for which customer.
2. Define foreign key with appropriate example. 8

Heaven's Light is Our Guide

RAJSHAHI UNIVERSITY OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
3rd Year Odd Semester Examination 2019

COURSE NO: CSE 3101 COURSE TITLE: Database Systems

FULL MARKS: 72 TIME: 3 HRS

N.B. (i) Answer any SIX questions taking any THREE from each section. 57/66
(ii) Figures in the right margin indicate full marks.
(iii) Use separate answer script for each section.

SECTION : A 32/32

Q.1 (a) What is database management system? Describe at least four differences between a file processing system and a database management system. 4 2/2

(b) Describe the levels of data abstraction in database management system with suitable diagram. 3 3/3

(c) Consider the following database schema: 5 5/5

Student(Roll_No, Name, Dept_Name, CGPA)
Course(Course_No, Course_Title, Credit)
Std_Marks(Roll_No, Course_No, Marks)
Dept(Dept_Name, Office_Telephone, Head_of_Dept)

10/10

Now determine which of the following attribute sets can be specified as super key, primary key, foreign key.

(i). {Dept_Name} in student relation
(ii). {Dept_Name, Office_Telephone} in Dept relation
(iii). {Course_No} in Std_Marks relation
(iv) {Course_No, Roll_No} in Std_Marks relation
(v). {Course_Title} in Course relation.

Q.2 (a) Define ER model. Describe the scenario with appropriate figure for the placement of relationship attribute for one-to-one, one-to-many, many-to-one and many-to-many relationship. 4 3/3

(b) Explain the differences between strong entity set and weak entity set with appropriate examples for each. 4 4/4

12/12

(c) Differentiate among the following terms with suitable examples: 4 4/4
(i). Inner join, Left outer join, Right outer join
(ii). Relation and Tuple

Q.3 (a) Define the following terms with proper example: 4 2/2
(i). Derived Attribute,
(ii). Multivalued Attribute
(iii). Descriptive Attribute

(b) Consider the following DB schema: 8 8/8

Book(ISBN, Book_Name, Genre, Language)
Publisher(Publisher_ID, Name, Country)
Book_Publisher_Relationship(Publisher_ID, ISBN, Price, No_Of_Pages)

10/10

[N.B: ISBN → International Standard Book Number]

Now represent the following queries in SQL:

(i). Find the ISBN, name and genre of all the books that are written in Bengali.
(ii). Find the name and genre of all the books that contain the term "Rahasya" in their name.
(iii). Find all the book genres and the number of books in each genre.
(iv). Find the name, genre and price of the most expensive book.
(v). Find the name, genre and price of the most expensive book in each genre.

Q.4 (a) Specify the difference between the following terms with proper example: (i) char(50) and varchar(50), (ii) Natural join and outer join. 5

(b) What are the ACID properties of database transactions? 2

(c) What do you mean by 'Atomic transaction'? What is the advantage of atomicity in DBMS? 3

(d) What should be done to ensure atomicity of a transaction? 2

SECTION-B 25/34

Q.5 (a) Define transaction. Consider the following schedule. Determine whether they are conflict serializable or not. 4

T_1	T_2
read(A);	
A:=A+10;	
	read(A);

	A:=A-100;
	write(A);
	read(B);

write(A);
read(B);
B:=B-10;
write(B);	

	B:=B+100; write(B);

(b) What is the difference between serial schedule and serializable schedule? How to determine, if two transactions T_i and T_j are conflicting. 4

(c) Describe the two phase locking protocol with appropriate example. Why is it important? 4

Q.6 (a) Consider the following DB schema: 8 6/8

Author(Author_ID, Author_Name, Birth_Year, Contact_No, No_of_Books, No_of_Awards)
Book(ISBN, Book_Name, Price, No_of_Pages)
Character_from_Book(Character_ID, Character_Name, Age, Address)
AuthorBookRelationship(ISBN, Author_ID)
BookCharacterRelationship(ISBN, Character_ID)

6/12

[N.B: ISBN → International Standard Book Number]

Now write an expression in relational algebra for each of the following queries:

(i). Find the birth year and number of books of Rabindranath Thakur.
(ii). Find the name, age and address of all the book-characters who are not teenagers.
(iii). Find the number of books written by an author in average.
(iv). Find the name and price of the most expensive bok.
(v). Find the name and price of all the books written by satyajit Roy.

(b) Construct the E-R diagram of the database from this DB schema. 4 0/4

Q.7 (a) Define database trigger. Write down the syntax of creating database trigger. Why is it important? 4 4/4

(b) Describe the advantages of PL/SQL over SQL. Write down a PL/SQL code block for inverting an integer number. 4 4/4

10/10

(c) Define stored procedure. Create a stored procedure to check the total deposited amount to an account when the account_id is supplied from outside. 4 2/2

Q.8. (a) What is the significance of view in database system? 2 2/2

(b) Determine which of the following views are not updateable and why: 6 3/6

(i). Create View AuthorView as (Select Author_Name, 2019-Birth_Year as Age, No_of_Books from Author);
(ii). Create View AuthorView2 as (Select Author_Name, Birth_Year, No_of_Books from Author);
(iii). Create View Author_Contact_View as (Select Author_Name, Contact_No, No_of_Books from Author Natural join AuthorContactInfo);
(iv). Crete View Group_View as (Select Genre, count(ISBN) from Book group by Genre)

9/12

(c) What do you mean by the following sentences or diagrams: 4 4/4

(i). There exists a many-to-one relationship from city to country
(ii). The relationship set from book to author is many-to-many
(iii).

•••