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17CS53

Fifth Semester B.E. Degree Examination, Jan./Feb.2021 Database Management System

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Discuss the main characteristics of the database approach and how it differs from traditional file systems? (08 Marks)
- b. What are the different types of database end users? Discuss the main activities of each. (06 Marks)
- c. Describe the three schema architecture? (06 Marks)

OR

- 2 a. Design an ER diagram for company database with atleast four entities. (08 Marks)
- b. What is meant by Recursive relationship type? Give some example of recursive relationship type. (06 Marks)
- c. What is Generalization? Illustrate how it is helpful with an example. (06 Marks)

Module-2

- 3 a. Discuss the characteristics of relation that make them different from ordinary tables. (08 Marks)
- b. Discuss DIVISION operation. Find the quotient for the following : A/B_1 , A/B_2 and A/B_3 ; where A, B_1 , B_2 and B_3 are

A =

SNo.	PNo.
S ₁	P ₁
S ₁	P ₂
S ₁	P ₃
S ₁	P ₄
S ₂	P ₁
S ₂	P ₂
S ₃	P ₂
S ₄	P ₂
S ₄	P ₄

$B_1 =$

PNo.
P ₂

$B_2 =$

PNo.
P ₂
P ₄

$B_3 =$

PNo.
P ₁
P ₂
P ₄

- c. Explain the basic datatypes available for attributes in SQL. (08 Marks)

OR

- 4 a. Explain the steps to convert the basic ER model to Relational Database Schema? (10 Marks)
- b. For the following relations for a book club :

MEMBERS (member-id, Name, Designation, Age)

BOOKS (Bookid, BookTitle, Book-Author, Book-Publisher, Book-price)

RESERVES (Member-id, Book-id, Date)

Write the SQL queries,

- (i) Find the names of members who are professors older than 45 years.
- (ii) List the titles of books reserved by professors.
- (iii) Find ID's of members who have not reserved books that cost more than Rs.500.
- (iv) Find the authors and titles of books reserved on 27-May-2017.
- (v) Find the names of members who have reserved all books. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. What are the components of the JDBC architecture? Describe four different architectural alternatives for JDBC drivers. (10 Marks)
- b. Why are stored procedures important? How do we declare stored procedure and how they called from application code? (05 Marks)
- c. Explain the impedance mismatch between host Languages and SQL. (05 Marks)

OR

- 6 a. What is a three tier architecture? What advantages it offer over single tier and two tier architectures? Give a short overview of the functionality at each of the three tiers. (10 Marks)
- b. What is SQLJ and how it is different from JDBC? (05 Marks)
- c. What is CGI and what problems does it address? (05 Marks)

Module-4

- 7 a. Explain an Informal design guidelines for a relational schema design. (08 Marks)
- b. What do you understand by attribute closure? Give an example. (04 Marks)
- c. Consider the following relations for published books”
 Book (Book_title, Author_Name, Book_type, List_Price, Author_Application, Publisher)
 Suppose the following dependencies exists
 Book_Title → Publisher, Book_Type
 Book_Type → List_price
 Author_Name → Author_Affiliation.
 (i) What normal form is the relation in? Explain your answer.
 (ii) Apply normalization until you cannot decompose the relations further, state the reasons behind each decomposition. (08 Marks)

OR

- 8 a. A set of functional dependencies for the relation $R\{A, B, C, D, E, F\}$ is $AB \rightarrow C, C \rightarrow A, BC \rightarrow D, ACD \rightarrow B, BE \rightarrow C, EC \rightarrow FA, CF \rightarrow BD, D \rightarrow E$. Find minimal cover for this set of functional dependencies. (10 Marks)
- b. Define fourth normal form? When is it violated? Why is it useful? (06 Marks)
- c. Why is the domain key normal form (DKNF) known as ultimate normal form? (04 Marks)

Module-5

- 9 a. Explain the desirable properties of transaction. (08 Marks)
- b. Describe the four levels of isolation in SQL. (06 Marks)
- c. What is the two phase locking protocol? How does it Guarantee serializability? (06 Marks)

OR

- 10 a. What is a time stamp? How does the system generates time stamps? (06 Marks)
- b. Describe the actions taken by the recovery manager during checkpointing. (06 Marks)
- c. Explain shadow paging with an example. (08 Marks)
