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TCS–402/TIT–402

B. TECH. (CS/IT)
(FOURTH SEMESTER)
END SEMESTER EXAMINATION, 2018

DATABASE MANAGEMENT SYSTEM

Time : Three Hours

Maximum Marks : 100

Note : (i) This question paper contains five questions with alternative choice.

(ii) All questions are compulsory.

(iii) Instructions on how to attempt a question are mentioned against it.

(iv) Each part carries **ten** marks. Total marks assigned to each question are **twenty.**

1. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

   (a) Explain the following :

   (i) View of Data

   (ii) Three schema architecture of database

   (iii) Extension and Intension

   (iv) Data Independence

(b) What are data models ? Explain different categories of data models.

(c) Discuss the different types of user-friendly interfaces and types of database utilities.

2. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) What is relation ? Differentiate between a relation schema and relation instance. Define the referential integrity constraint and degree of a relation. What are domain constraints ?

(b) Explain how to build ER model for university with entities department, instructor, student, and class. Instructors and students belong to one department only. Instructors and students related to a class with many to many relations. Assume suitable attributes. Explain how the ER model can be translated to relations.

(c) Explain the fundamental operations in relational algebra with examples.

3. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) What are the various advantages of SQL ? When are null values used ? Explain the following Operators in SQL with examples :

(i) LIKE

(ii) IN

(iii) Between

(iv) Auto Increment

(b) Write the SQL Queries for the following :

(A) EMP (Emp no, ename, job, mgr, hiredate, sal, comm., dept no)

(B) Dept (Dept no, dname, loc)

(C) Salgrade (grade, losal, hisal)

(i) Find the employees who earn the highest salary in each job type. Sort in descending salary order.

(ii) Find the most recently hired employees in each department ordered by hired date.

(iii) Explain the terms DQL and TCL.

(c) (i) Compute the closer of the following set of functional dependencies for a relation scheme. R(A,B,C,D,E)

F = {A ->BC, CD->E, B->D, E->A}

List out the candidate keys of R.

(ii) What are cursors and triggers ?

4. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

   (a) What three data anomalies are likely to be the result of data redundancy ? How can such anomalies be eliminated ?

   (b) Consider the following relation R(A,B,C,D,E) and FD's A->BC, C->A, D->E, F->A, E->D is the decomposition of R into R1(A, C, (d), R2(B, C, D) AND R3(E, F, D) lossless.

   (c) Explain the following :

   (i) MVD

   (ii) 4NF

   (iii) 5NF

5. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

   (a) What is transaction ? Explain the ACID properties of transactions.

   (b) Why is concurrency control required ? Explain the locking techniques in detail.

   (c) Explain the following terms :

   (i) View serializability

   (ii) Checkpoints

   (iii) Deadlock