

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 7310

Roll No.

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**M.C.A.**

(SEM. III) ODD SEMESTER THEORY  
EXAMINATION 2010-11

**DATABASE MANAGEMENT SYSTEMS**

*Time : 3 Hours*

*Total Marks : 100*

**Note** :— (1) Attempt **all** questions.

(2) All questions carry equal marks.,

1. Attempt any **four** parts of the following :— (5×4=20)
- (a) What are the characteristics that distinguishes a Database Management System from traditional file processing system ?
  - (b) What are the advantages and disadvantages of using a Database Management System ?
  - (c) Explain about External, Conceptual and Internal Schemes.
  - (d) What is a data model ? What is the relational data model ? What is data Independence and how does a DBMS support it ?
  - (e) Draw the Architecture of a DBMS and briefly explain functions of each component.
  - (f) Explain the different roles of a Database Administrator, Application Programmers and End users of a database.

2. Attempt any **four** parts of the following :— (5×4=20)

- (a) Explain the following terms with suitable example :  
Query language, Host Language, Data Sub Language.
- (b) Name the main steps in database design. What is the goal of each steps ? In which steps in the ER model mainly used ?
- (c) What is a logical data Independence and why is it important ? Explain.
- (d) Explain the following :—

Entity, Entity set, Attribute and key.

- (e) Define Key Constraints and Referencial constraints. Explain them with a suitable example.
- (f) What is the difference between tuple Relational Calculus and domain Relational Calculus ?

3. Attempt any **four** parts of the following Schema :—

(5×4=20)

Suppliers (Sid : Integer, Sname : String, Address : String)

Parts (Pid : Integer, Pname : String, Colour : String)

Catalog (Sid : Integer, Pid : Integer, Cost : Real)

The key fields are underlined. Write any four queries in Relational Algebra.

- (a) Find the names of Suppliers who supply some red part.
- (b) Find the Sids of Suppliers who supply some red part and Address as, '221 XYZ'.

- (c) Find the Sids of Suppliers who supply every part.
  - (d) Find the Sids of Suppliers who supply every red Part and every green part.
  - (e) Find the pairs of parts supplied by at least two different suppliers.
  - (f) Find the Pids of parts supplied by every suppliers at less than Rs. 200.
4. Attempt any **two** parts of the following :— (10×2=20)
- (a) Discuss attribute semantics as an informal measure of goodness for a relational schema.
  - (b) Why should nulls in a relation be avoided as far as possible ? Discuss the problem of spurious tuples and how we can prevent it ?
  - (c) Define and explain with suitable example First, Second and Third Normal Forms.
5. Attempt any **two** parts of the following :— (10×2=20)
- (a) What is meant by the concurrent execution of database transaction in a multi-user system ? Explain why concurrency control is needed with a suitable example.
  - (b) What is the system log used for ? What are the typical kinds of records in a system log ? What are transaction commit points, and why are they important ?
  - (c) Discuss the problem of deadlock and the different approaches to dealing with these problems.