

B.E. 4th Semester (IT) Examination, May-2010

DATABASE MANAGEMENT SYSTEM

Paper - CSE-202-E

Time allowed : 3 hours] [Maximum marks : 100

Note : Attempt any five questions.

1. (a) What are the responsibilities of a DBA? 8
- (b) Differentiate between
- (i) DDL and DML
 - (ii) Procedural and nonprocedural DML
 - (iii) Logical and physical data independence
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2. (a) What are the differences between a weak and a strong entity set? What is the significance of a weak entity? How can these both be represented in an ER diagram?
- (b) With the help of an example describe the process of reduction of an ER scheme to tables.

3. (a) Explain the distinction between closed and open hashing. Discuss the relative merits of each technique in database applications.

(b) Differentiate between

- (i) Primary index and secondary index
- (ii) Sequential files and index sequential files.

4. (a) Let the following relation schemes be given:

$$R=(A,B,C)$$

$$S=(D,E,F)$$

Let relations $r(R)$ and $s(S)$ be given. Give an expression in the tuple relational calculus that is equivalent to each of the following:

(i) $\pi_A(r)$

(ii) $\sigma_{B=17}(r)$

(iii) $r \times s$

(iv) $\pi_{A,E} [\sigma_{C=D}(r \times s)]$

- (b) Explain the following operators of relational algebra giving examples :

join, division, difference, rename

5. (a) Suppose that we decompose the scheme $R = (A, B, C, D, E)$ into (A, B, C) and (A, D, E) . Show that this decomposition is a lossless join decomposition if the following set F of functional dependencies holds :

$A \rightarrow BC$

$CD \rightarrow E$

$B \rightarrow D$

$E \rightarrow A$

- (b) Differentiate between 3NF and BCNF. Which is a stronger normal form ?
6. (a) What are distributed databases? Describe their advantages and disadvantages ?
- (b) What are parallel databases? What are their various types?
7. (a) Elaborate ACID properties of a transaction.
- (b) What steps are required to be taken for recovery of a database system in the event of failure? Discuss.
8. Write short notes on :
- (a) Network and Hierarchical data model
- (b) Client - server architecture