2008-HIMACHAL PRADESH UNIVERSITY

B.TECH III SEMESTER DEGREE EXAMINATION
DATA BASE MANAGEMENT SYSTEM
(INFORMATION TECHNOLOGY, COMPUTER SCIENCE & ENGINEERING)

TIME-3 HOUR
MARK-100

NOTE: ANSWER ALL QUESTIONS

SECTION–A[10*8=80]

1.(a) Why would you choose a data base management system instead of simply storing data in system files?

(b) What is a Data model? Give a brief overview of Hierarchical data model.

2. (a) Explain the difference between Internal, External and Conceptual schema. How are these different schema layers related to the concept of logical and physical data independence?

3. (a) Construct an ER diagram for the database of a departmental store.

(b) Explain all variations of join operation with suitable examples.

4. Specify the following relational algebra operations in both tuple and domain relational calculus:

(a) $R(A,B) \times S(C,D)$

(b) $R(A,B,C) / S(B)$

(c) $R(A,B) - S(A,B)$

(d) Pie $(R(A,B,C))$

5. (a) What are the methods to handle collisions generated by Hashing?

(b) Write SQL constructs for the following operations:

(i) Modification of relation instances.

(ii) Deletion of a view.

(iii) Enforcing integrity constraints.

(iv) Grouping of data.

6. (a) Show the 5NF implies 4NF.

(b) What is the highest normal form for the following relations:

(i) $R(A,B,C,D)$ with A->BC, CD->B.

(ii) $R(A,B,C,D,E)$ with A->BC, E->A, CD->E. [5]

7. (a) Explain the major issues related to Database security.

(b) How are nested sub-queries optimized and evaluated?

8. Describe the architecture for a distributed dbms and identify the additional function it requires over a centralized DBMS.

SECTION–B[10*2=20]

9. Attempt the following questions:

(i) Define the term Data Dictionary.

(ii) What are the properties of relational model?

(iii) Give any four differences between sequential and direct files?

(iv) Explain the Null value and Dangling tuple problems.

(v) In which step of database design is the ER model mainly used?

(vi) Give a comparison between RDBMS and OODBMS.

(vii) What are the characteristics of Knowledge Base Database?

(viii) Why Denormalization is required?

(ix) How recovery is implemented using shadow paging

(x) Explain the inference rules for functional dependencies