DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [IT]
SUBJECT: (IT502) DATABASE MANAGEMENT SYSTEM

Examination	**:Second Sessional**	**Seat No.**	**: _____**
Date	**: 06/09/2014**	**Day**	**: Saturday**
Time	**: 11.15 to 12:30**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed. **[12]**

(a) Every FD is a MVD but there exists MVDies that are not FDies. Justify with appropriate example. **[2]**

(b) BCNF is stronger than 3NF. Justify with appropriate example. **[2]**

(c) What is the desirable properties of a decomposition **[1]**
(A) Partition constraint. **(B)** Dependency preservation.
(C) Redundancy. (D) Security.

(d) Maximum height of a B+ tree of order m with n key values is **[1]**
(A) $\log_m(n)$ (B) (m+n)/2
(C) $\log_m(m+n)$ **(D)** None of these

(e) In SQL, testing whether a sub query is empty is done using **[1]**
(A) DISTINCT **(B)** EXISTS
(C) NULL (D) UNIQUE

(f) Which normal form is considered adequate for normal relational database design? **[1]**
(A) 2NF (B) BCNF
(C) 3NF (D) 4NF

(g) How many candidate keys are possible for the given relation R.? **[1]**
R={A,B,C,D,E} F={A→B, BC→E, ED→A}
(A) 1 (B) 2
(C) 3 (D) 4

(h) The maximum number of Superkeys for the relation schema R(E,F,G,H) with E as the key is **[1]**
(A) 5 (B) 6
(C) 7 **(D)** 8

(i) Relation R has eight attributes ABCDEFGH. Fields of R contain only atomic values. F = {CH -> G, A -> BC, B -> CFH, E -> A, F -> EG} is a set of functional dependencies (FDs) so that F+ is exactly the set of FDs that hold for R. The relation R is **[1]**
(A) in 1NF, but not in 2NF (B) in 2NF, but not in 3NF
(C) in 3NF, but not in BCNF (D) in BCNF

(k) Order of B+ tree is 100 and total search key value are 1,000,000 then at most how many blocks from disk need to access for lookup? **[1]**

Q.2 Answer the following questions. Any two **[12]**

(a) Consider the universal relation R={A,B,C, D, E, F, G, H,I,J}and the set of functional dependencies F={A,B}→{C},{A}→{D,E}, {B}→{F}, {F}→{G, H},{D}→{I}.What is the key for R? Decompose R up to highest normal form. **[6]**

(b) (I) Find whether the given set F and G are equivalent or not. **[3]**
F={A→BC, CD→E, B→D} G={A→B, BC→E, ED→A}

(II) Find the Irreducible set of following set of functional dependency. **[3]**
F={A→BC, ABE→CDGH, C→GD, D→G, E→F}

(c) Explain Fixed length representation for variable length record. **[6]**

Q.3 (a) Draw the B+ tree for the following search key values **[6]**
B, E, Z, A, N, F, S, T, D, O, L, Q, U, W, R, X, P where n=3.

(b) Create an Extendable Hash structure for the following key values: **[6]**
x={12, 03, 52,45, 68, 75, 19, 26, 83, 64, 57, 37, 72, 46}
Assume that one bucket can store maximum 3 keys at a time where the hash function is H(x) = x mod 3.

OR

Q.3 (a) Draw the B+ tree for the following search key values **[6]**
4,9,15,18,8,22,12,20,30,21,35,40,29,33,45,39 where fan-out=3.

(b) (I) Explain Data Dictionary storage. **[3]**
(II) Give difference between sparse and dense index. **[3]**