**DBMS (CST101)**

**Practice questions on Normalization**

Q1 Prove the following using Armstrong’s axioms:

1. A🡪B, C🡪X, BX🡪Z, prove AC🡪Z
2. A🡪B, C🡪D, C🡪B, prove A🡪C

Q2 Consider relation R (ABCDE) and the set of functional dependencies F is AB🡪C, A🡪D, D🡪E. List F+.

Q3 Let R (ABCGHI) and FDs are: A🡪B, A🡪C, CG🡪H, CG🡪I, B🡪H. Compute (AG)+.

Q4 FDs set F = A🡪BC, CD🡪E, E🡪C, D🡪AEH, ABH🡪BD, DH🡪BC. Find non redundant cover.

Q5 Let R (ABCDEGHI), FDs F = A🡪BD, C🡪D, AD🡪CE, OG🡪H. List all candidate keys and find canonical cover of F.

Q6 Consider the following two sets of FDs:

F = A🡪C, AC🡪D, E🡪AD, E🡪H

G = A🡪CD, E🡪AH

Check whether these are equivalent, Justify.

Q7 Let R (ABCDE), FDs F = A🡪BC, CD🡪E, B🡪D, E🡪A, find all candidate keys, prime attributes, non prime attributes, B+, canonical cover of F and F+.

Q8 Let R (ABCD), FDs: B🡪D, AB🡪C, check whether R is in 2 NF, if not then convert it to 2NF.

Q9 What is BCNF? Also, explain the properties of decomposition with an example of each.

Q10 What is the highest normal form in all these relations:

1. R (ABCD), A🡪C, CD🡪B
2. R (ABC), A🡪B, B🡪A, C🡪A
3. R (JKL), JK🡪L, L🡪K

Q11 Let R (ABCD), FDs: AB🡪CE, E🡪AB, C🡪D, explain why R is in 2NF but not in 3NF.

Q12 Let R (ABCGHI), FDs: A🡪🡪B, B🡪🡪HI, CG🡪🡪H, why R is not in 4NF? Explain.