Yashoda Shikshan Prasarak Mandal's
YASHODA TECHNICAL CAMPUS, SATARA
An Autonomous Institute
FACULTY OF ENGINEERING
Department Computer Science and Engineering

Continuous Activity Plan

Subject: Database Management Systems (DBMS)
Activity Title: Functional Dependency and Normalization Analysis

CAS 2

Activity to Do:

1. Select the tables for which functional dependency and normalization analysis will be performed.
2. Identify the attributes, candidate key(s), primary key(s), and relevant functional dependencies for each selected relation.
3. Check whether the relations satisfy First Normal Form (1NF). Identify repeating groups or non-atomic values, if any, and convert the relations into 1NF.
4. Analyze partial dependencies and decompose the relations into Second Normal Form (2NF), wherever required.
5. Identify transitive dependencies and decompose the relations into Third Normal Form (3NF), wherever required.
6. Check the determinants of the functional dependencies and determine whether the relations satisfy Boyce–Codd Normal Form (BCNF). Perform decomposition wherever required.
7. Study multivalued dependencies and Fourth Normal Form (4NF). Identify an appropriate example from the selected database or construct a small illustrative relation, and explain the 4NF decomposition.
8. Show the final decomposed relations with their primary keys and foreign keys. Briefly explain whether the decomposition is lossless and whether dependencies are preserved, wherever applicable.
9. Prepare a clear normalization report and explain the functional dependencies, stages of normalization, and final schema.

Format to Submit CAS:

- PRN
- Roll Number
- Student Name
- Step-by-step normalization: 1NF, 2NF, 3NF, and BCNF, 4NF , showing the relations before and after decomposition

Functional Dependency and Normalization Analysis on Rubrics

Yashoda Shikshan Prasarak Mandal's

YASHODA TECHNICAL CAMPUS, SATARA

An Autonomous Institute

FACULTY OF ENGINEERING

Department Computer Science and Engineering

Name of Course: Database Management System **Class: TY** **Academic year : 2026-27**

Sr. No.	Assessment Parameter	Sub-Criteria	Excellent (Full Marks)	Good (Mid Marks)	Average (Low Marks)
1	Identification of Functional Dependencies (4 Marks)	Identification of attributes, candidate keys, primary keys, and correct functional dependencies for the selected relations.	Correctly identifies attributes, candidate keys, and all relevant functional dependencies with clear justification. (4)	Identifies most keys and dependencies, with minor omissions or errors. (2–3)	Unable to identify keys or functional dependencies correctly; major conceptual errors. (0–1)
2	First and Second Normal Forms (4 Marks)	Analysis of 1NF and 2NF; identification of non-atomic values, repeating groups, and partial dependencies; appropriate decomposition.	Correctly converts relations to 1NF and 2NF and clearly explains the changes and partial-dependency removal. (4)	Performs the basic conversion with minor errors or incomplete explanation. (2–3)	Unable to apply 1NF or 2NF; decomposition is incorrect or missing. (0–1)
3	Third Normal Form and BCNF (5 Marks)	Identification of transitive dependencies and determinants; decomposition into 3NF and BCNF wherever required.	Correctly identifies transitive dependencies and BCNF violations and produces appropriate decompositions with justification. (5)	Applies 3NF and BCNF with some minor errors or incomplete justification. (3–4)	Shows limited understanding of 3NF/BCNF; major errors in identifying dependencies or decomposition. (0–2)
4	Multivalued Dependencies and 4NF (3 Marks)	Understanding of multivalued dependencies, identification of an MVD, and explanation of 4NF decomposition.	Clearly explains MVDs and 4NF and demonstrates a correct decomposition using a suitable relation. (3)	Demonstrates basic understanding but the example or decomposition has minor gaps. (2)	Unable to explain MVDs or 4NF correctly; no valid decomposition. (0–1)

5	Final Schema, Explanation and Presentation (4 Marks)	Presentation of final relations with keys, clarity of normalization steps, and explanation of the resulting schema.	Presents a clear final normalized schema with keys and explains each stage accurately and confidently. (4)	Presents the final schema and gives a basic explanation, with minor omissions. (2–3)	Final schema is incomplete or unclear; unable to explain the normalization process. (0–1)

Course coordinator **Exam Coordinator** **HOD**