



**DURATION: One and Half Hours (1 ½ Hours)**

**Date: 14.03.2015**  
**p.m.**

**Time: 4.00 p.m. – 5.30**

**Answer All Questions.**

**QUESTION 01**

Read the following scenario carefully.

Torana Music Centre has decided to store information about musicians who perform on its albums in a database.

Each musician has a musician ID, name and phone number. A musician may hold several phone numbers. Each musician lives in many places and a place can have only one musician. A place should have a place ID and address. This address should be stored separately as street and city.

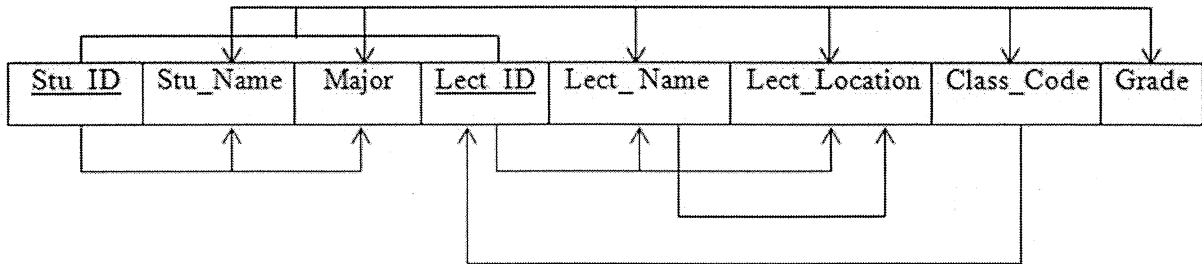
Each instrument has an instrument ID and a name. Each album has an album ID, title and a format. Each song has a song ID, title and an author. Each musician may (may not) play an instrument and a given instrument is played by only one musician. Each album has several songs on it, but no song may appear on more than one album.

Each song is performed by one or more musicians and a musician performs several songs. Once a musician performs a song, the performed date should be stored appropriately. Each album has exactly one musician who acts as its producer. A musician produces several albums. Once a musician produces an album, the produced date should be stored appropriately.

- a) Identify entities and their attributes. Draw each entity with its attributes using the ER notation (use Chen notation). When drawing, use standard naming conventions you learned.
- b) Draw the complete ER diagram with proper relationships.
  - You don't need to show all the attributes of an entity (Because you showed them in the previous question). Show only the primary key of each Entity.
  - Show the proper connectivity of the relationships.
  - Represent the relationship's participation as optional or mandatory.
  - Use standard Chen notation to draw the ER diagram.
- c) Draw the relevant Relational Schema for the ER diagram.

## QUESTION 02

Look at the following dependency diagram.



- What is the Normal Form that this table is currently in?
- What is "Partial Dependency"? If there are any partial dependencies in the above diagram, identify and mark them.
- What is "Transitive Dependency"? If there are any transitive dependencies in the above diagram, identify and mark them.
- Normalize this table conform to both Third Normal Form (3NF) and the Boyce-Codd Normal Form (BCNF).

Clearly show the steps (1NF, 2NF, 3NF and BCNF) you follow and mark the primary keys of each decomposed table.