NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF COMMUNICATION AND INFORMATION SCIENCE

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE

BACHELOR OF SCIENCE (HONOURS) DEGREE IN LIBRARY AND INFORMATION SCIENCE

PART II SECOND SEMESTER JULY 2012 SUPPLEMENTARY EXAMINATIONS

ILI 2201: DATABASE APPLICATIONS IN ARCHIVES, LIBRARIES AND PUBLISHING

TIME: 3 HOURS

Instructions to candidates

1. Answer any four questions.
2. Give equal time to each question.
3. Each question carries 25 marks.
4. Importance is attached to clear presentation of ideas, good expression and legibility of handwriting.

1.1 Define the following terms:

- Database [1 mark]
- Distributed database [1 mark]
- Data dictionary [1 mark]
- Meta-data [1 mark]

1.2 Briefly examine the impact of using database systems in place of traditional file systems in a library. [6 marks]

1.3 Discuss the different components of a database system. [15 marks]

2.1 With the aid of examples, explain how the following terms are used in the database environment:

- Primary key [2 mark]
- Candidate key [2 mark]
- Foreign key [2 mark]
- Functional key [2 mark]
- Full functional dependency [2 mark]

2.2 Explain the importance of normalising relations. [3 marks]

2.3 Using your own practical examples in a library environment, discuss the following normalisation techniques:

- INF [4 marks]
- 2NF [4 marks]
- NF [4 marks]

3.1 Explain the following terms using examples:

- Cardinality [2 marks]
- Ordinality [2 marks]
- Binary relationship [2 marks]
- Unary relationship [2 marks]
- Ternary relationship [2 marks]

3.2 The Faculty of Communication and Information Science has four departments and each department is identified by a Department Code. A student identified by the Student Number may only belong to one department. Each department has several courses identified by the Course Code. There is only one lecturer allocated to each course, however each course may be offered in different departments. The student may take several courses at the same time.

3.2.1 Identify entities and their attributes. [7 marks]

3.2.2 Draw an ERD for the above scenario stating all assumptions. [8 marks]

4. Data and software are vulnerable to threats of data destruction. Discuss database recovery procedures you would use in a library environment. [25 marks]

5.1 What is a deadlock? [2 marks]

5.2 Explain how deadlocks are resolved in database transactions? [9 marks]

5.3 Analyse three concurrency problems associated with database transactions. [14 marks]

6. Give a detailed discussion of object oriented databases and their use in libraries. [25 marks]

END OF PAPER