



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

**UNIVERSITY EXAMINATION FOR THE BACHELOR OF SCIENCE BUSINESS
INFORMATION SYSTEMS**

4th YEAR 1st SEMESTER 2016 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: IIS 3411

COURSE TITLE: DATABASE APPLICATIONS

EXAM VENUE: LR 17

STREAMS: BIS

DATE: 13/12/2016

EXAM SESSION:

TIME: 2.00 HOURS

INSTRUCTIONS:

- 1. Answer Question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on the question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION ONE 30 MARKS

1. Which of the following gives a logical structure of the database graphically?
 - a) Entity-relationship diagram
 - b) Entity diagram
 - c) Database diagram
 - d) Architectural representation

2. The entity relationship set is represented in E-R diagram as
 - a) Double diamonds
 - b) Undivided rectangles
 - c) Dashed lines
 - d) Diamond

3. The Rectangles divided into two parts represents
 - a) Entity set
 - b) Relationship set
 - c) Attributes of a relationship set
 - d) Primary key

4. Consider a directed line from the relationship set advisor to both entity sets instructor and student. This indicates _____ cardinality
 - a) One to many
 - b) One to one
 - c) Many to many
 - d) Many to one

5. We indicate roles in E-R diagrams by labeling the lines that connect _____ to _____.
 - a) Diamond, diamond
 - b) Rectangle, diamond
 - c) Rectangle, rectangle
 - d) Diamond, rectangle

6. An entity set that does not have sufficient attributes to form a primary key is termed a _____.
 - a) Strong entity set
 - b) Variant set
 - c) Weak entity set
 - d) Variable set

7. For a weak entity set to be meaningful, it must be associated with another entity set, called the
 - a) Identifying set
 - b) Owner set
 - c) Neighbour set

d) Strong entity set

8. Weak entity set is represented as

- a) Underline
- b) Double line
- c) Double diamond
- d) Double rectangle

9. If you were collecting and storing information about your music collection, an album would be considered a (n) _____.

- a) Relation
- b) Entity
- c) Instance
- d) Attribute

10. What term is used to refer to a specific record in your music database; for instance; information stored about a specific album?

- a) Relation
- b) Instance
- c) Table
- d) Column

QUESTION TWO 20 MARKS

- a) List and briefly explain the four (4) principal business functions as outlined in information systems for business functions. (12 mks)
- b) Which three types of errors can corrupt data codes and cause processing errors. (3 mks)
- c) Application controls are programmed procedures designed to deal with potential exposures that threaten specific applications, such as payroll, purchases, and cash disbursements systems. Which are the three categories under application controls? (3 mks)
- d) Define the term Entity Relationship Diagram (ERD). (2 mks)

QUESTION THREE 20 MARKS

- a) Which are the three basic components of an ERD? (3 mks)
- b) List the three characteristics of a Relationship. (3 mks)
- c) List the three characteristics of an Attribute. (3 mks)
- d) List the four characteristics of an Entity. (4 mks)
- e) What seven major activities are associated with system implementation and maintenance? (7 mks)

QUESTION FOUR 20 MARKS

Consider two E-R models. Model A consists of two entities and one relationship joining them. The entities are *lecturer* and *course* and the relationship is *teaches*. The second model consists of three entities; the first and the third are the same as above but the second entity is called *lecture*. The first and second entities are joined by a relationship called *gives* while the second and the third entities are joined by a relationship called *of*.

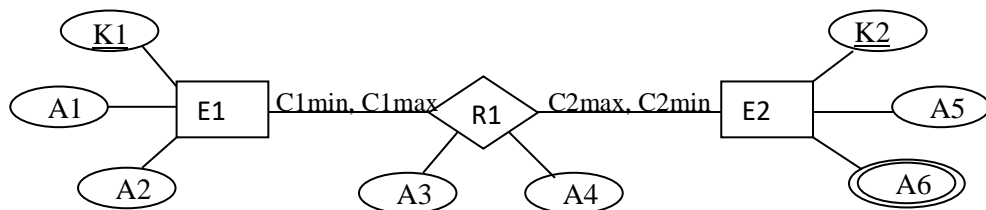
Which two of the following are correct? Briefly justify your answers.

- i. Both models allow a course to have more than one lecture from the same lecturer
- ii. Model B is more appropriate if information about all lectures, past and present, is to be stored
- iii. Model A does not allow lecture date and time to be stored
- iv. Model B leads to more tables than Model A does when translated to the relational model

QUESTION FIVE 20 MARKS

Alice has a large DVD movie collection. Her friends like to borrow her DVD's, and she needs a way to keep track of who has what. She maintains a list of friends, identified by unique FID's (friend identifiers) and a list of DVD's, identified by DVDID's (DVD identifiers). With each friend is the name and the all-important telephone numbers which she can call to get the DVD back. With each DVD is the star actor name and title. Whenever a friend borrows a DVD, Alice will enter that fact into her database along with the date borrowed. Whenever the DVD gets returned that fact, too, gets noted along with the date returned. Alice wants to keep a complete history of her friends' borrowing habits so that she can ask favors of the heavy borrowers (or perhaps refuse to make further loans to those who habitually don't return them quickly). Below is an E-R diagram for a database to help Alice out.

- a. Provide appropriate names for entities E1, E2; attributes A1, A2,.... A5; multi-value attribute A6, relationship R1, and cardinality constraint C1min, C1max, C2min and C2max.



Entity E1: _____ Key K1: _____ Attribute A1: _____ Attribute A2: _____
Entity E2: _____ Key K2: _____ Attribute A5: _____ Multi-value Attribute A6: _____
Relationship R1: _____ Attribute A3: _____ Attribute A4: _____
Cardinality C1min: _____ C1max: _____ C2max: _____ C2min : _____

b. Represent this database as a collection of 3NF relational tables. You need not specify data types for columns.