



# THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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**MAIN EXAMINATION**

**MAY – JULY 2018 TRIMESTER**

**FACULTY OF SCIENCE**

**DEPARTMENT OF COMPUTER AND LIBRARY SCIENCE**

**REGULAR PROGRAMME**

**DIT 003: DATABASE SYSTEMS**

<b>Date: JULY 2018</b>	<b>Duration: 2 Hours</b>
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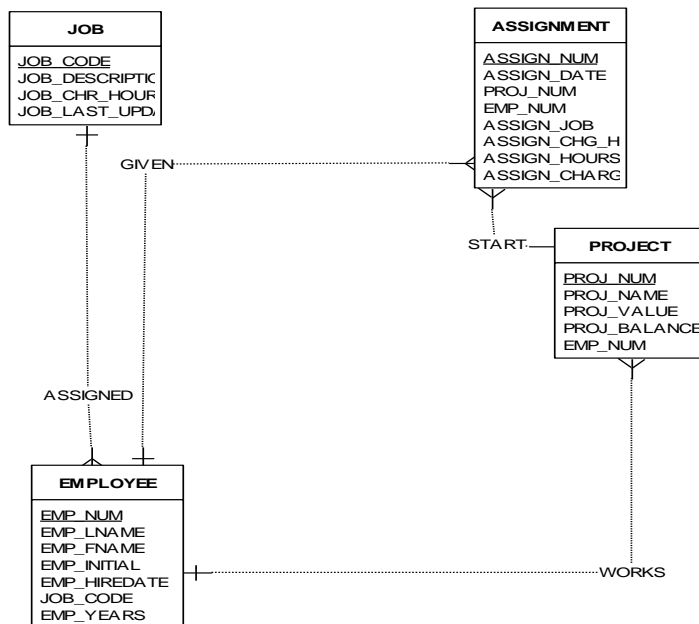
<b>INSTRUCTIONS: Answer Question ONE and any other TWO Questions</b>
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- Q1. a) Digital Academy contracts you to develop a database that will manage students' admission and academic records. Use Wampserver to create database.
- i) Create a relation schema of the tables you would use. **(2 Marks)**
  - ii) create a down SQL code that you would use to create their database **(2 Marks)**
  - iii) create down SQL code to create the tables in (i) above **(2 Marks)**
  - iv) Write a SQL statement that can be used to query all the rows in tables created above. **(1 Mark)**
- b) Differentiate between the following:
- i) **WHERE** and **HAVING** clause **(2 Marks)**
  - ii) **ORDER BY** and **GROUP BY** clause **(2 Marks)**
- c) Define null in relational model and list three reasons of its occurrence. **(4 Marks)**
- d) Identify **TWO** types of database schema as used in database. **(4 Marks)**
- e) State **FOUR** major properties of database management system. **(4 marks)**

- f) Sarah and her colleagues were evaluating database modules. Describe **THREE** types of database models that they discussed in their class. **(3 marks)**
- g) Citing relevant examples in each case, explain the strategies that organization and the top management can put in place to compete with other companies on database skills and take full advantage over the others in the Market. **(4 Marks)**

- Q2. a) Describe data independence and explain why it is lacking in the file based approach. **(4 Marks)**
- b) List any **FOUR** functions of DBMS. **(2 Marks)**
- c) Differentiate between the following:
- i) An object and a class in the object oriented data model **(2 Marks)**
  - ii) Entity integrity rules and referential integrity rules and illustrate with examples. **(5 Marks)**
- d) Define the following terms.
- i) Denormalization
  - ii) Third Normalization form **(4 Marks)**
- e) Outline **THREE** limitations of File management systems **(3 Marks)**

- Q3. a) Construct company database stores data for a consulting company that tracks all charges to projects. The charges are based on the hours each employee works on each project. The structure is as follows:



Create a database query language that would capture above information. **(8 Marks)**

b) Describe any **FOUR** benefits any organization would enjoy for implementing the database approach information system over file based approach. **(4 Marks)**

c) Discuss **TWO** importance of database normalization **(3 Marks)**

d) State and explain **FOUR** types of entity attributes in a database. **(4 Marks)**

Q4. a) Describe the **THREE** components of an Entity Relationship Model and illustrate each with examples. **(6 Marks)**

b) Explain the data abstraction in Database Management environment. Illustrate using the ANSI-SPARC architecture. **(8 Marks)**

c) Define specialization hierarchy and state its importance. **(4 Marks)**

d) Differentiate between Data Manipulation Language and Data Definition Language queries. **(2 Marks)**

Q5. a) Define the following terms **(4 Marks)**

- i) Foreign key
- ii) Entity Relationship (ER) Diagram

b) Briefly explain **TWO** types of Database Management System (DBMS). **(4 Marks)**

c) Highlight **FOUR** benefits of DBMS **(4 Marks)**

d) Differentiate between Hierarchical database model and Network database model **(2 marks)**

e) Briefly explain the terms below as used in relational database model. **(4 Marks)**

- i) Tuple
- ii) Relational Key

f) Discuss **TWO** transaction properties **(2 Marks)**

**\*END\***