

UNIVERSITY OF ZULULAND

FACULTY SCIENCE AND AGRICULTURE
DEPARTMENT OF COMPUTER SCIENCE

Assessment II – 19 September 2023

COURSE CODE: 4CPS232

Databases and Information Management I

Examiner: S. Mathaba

Moderator: IN Mba

Duration: 1h30

60 marks

Instructions

- I. Answer all questions.
- II. Please note that this paper has 2 sections

SECTION A [30 Marks]

1. Differentiate between super type entity and subtype entity. [4]
2. Explain the use of subtype discriminator. [2]
3. Use an example to differentiate between disjoint and overlapping subtypes [4]
4. What is entity cluster? [2]
5. List and explain any 3 characteristics of the good primary key [6]
6. Explain Fan trap relationship [2]
7. List and briefly describe the five stages of Systems Development Life Cycle(SDLC) [10]

Planning
Analysis

Design
Implementing
Maintenance

SECTION B [30 Marks]

8. An engineering consultancy firm supplies temporary specialized staff to bigger companies in the Country to work on their project for certain amount of time. The table below lists the time spent by each of the company's employees at other companies to carry out projects.

Employee Num	Contract No	Hours	Employee Name	Company ID	Company Location
616681B	SC1025	72	P. White	SC115	Belfast
674315A	SC1025	48	R. Press	SC115	Belfast
323113B	SC1026	24	P. Smith	SC23	Bangor
616681B	SC1026	24	P. White	SC23	Bangor

- a) Explain which normal form this table is. [2]
- b) Find the Primary Key(s) for this relation and explain your choice. [4]
- c) Find the **Fully Functional Dependencies** on the PK and the **Partial Dependencies** on the PK. [4]
- d) Normalise this table to 2NF. [4]
- e) Find the transitive dependencies on the 2NF tables. [2]
9. a) Create a table structure for the table EMPLOYEE below [4]

EMP_NUM	EMP_LASTNAME	EMP_FIRSTNAME	EMP_INITIALS	EMP_HIREDATE	JOB_CODE
101	News	John	G	08-Nov-00	502
102	Senior	David	H	12-Jul-89	501
103	Arbough	June	E	01-Dec-96	500
104	Ramoras	Anne	K	15-Nov-87	501
105	Johnson	Alice	K	01-Feb-93	502
106	Smithfield	William	S	22-Jun-04	500

- b) Write an SQL code that will change JOB_CODE to 501 for all employees hired before 22-Aug-91 [4]
- c) Write an SQL code that will list distinct JOB_CODE in the EMPLOYEE table [2]
- d) Write the SQL code to delete the row for the person named William Smithfield, who was hired on June 22, 2004, and whose job code classification is 500. (Hint: Use logical operators to include all of the information given in this problem.) [4]