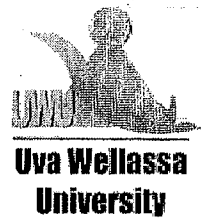


Uva Wellassa University of Sri Lanka
 Faculty of Science & Technology
 Department of Computer Science & Technology
 300 level 1st Semester Examination May/July 2017
 SCT375-2 Database Management Systems



Instructions to candidates

Number of questions: Four (04)
Time allocation: Two (02) hours
Mark allocation: 100
Answer all questions.

1.
 - a. Briefly explain the importance of DBMS. (5 mark)
 - b. Identify the attributes, foreign keys and primary keys of the given tables.
 Department (deptID, building, budget) AND Employee (empID, name,deptID) (5 mark)
 - c. Briefly explain the logical data independency and physical data independency? (6 mark)
 - d. Explain the 3-tier architecture in DBMSs. (9 mark)

2.
 - a. By using an appropriate table, briefly explain the functional dependency. (4 mark)
 - b. Describe insert, delete and update anomalies using the following table. (9 mark)

Table 1: ABC (PVT) Ltd Supplier Details

PRODUCT	SUPPLIER	PRICE	CITY_CODE	CITY	POPULATION
Tracks	Astra	120000	00001	Colombo	650000
Tracks	SAAB	500000	00002	Kandy	110000
Car	SAAB	150000	00002	Kandy	110000
Car	Volvo	100000	00003	Badulla	48000
Van	Astra	400000	00001	Colombo	650000

- c. The ABC Company has decided to convert the existing manual system to a database. Figure 1 shows a table of the database. Answer the following questions using Figure 1.

UserID	Name	Dep_ID	Department	Dep_address	UserEmail
U1	Saman	C1	ABC	1 st floor, Badulla	abc.com abc123.com
U2	Amal	C2	XYZ	2 nd floor, Badulla	Xyz.com Xyz123.com

Figure 1: User details of the ABC Company

- i. Determine the suitable primary key. (2 mark)
- ii. Normalize the table by explaining each step. (10 mark)



3.

- a. List two (02) benefits of ER diagrams. (2 mark)
- b.
- i. Define four (04) mapping cardinalities for the binary relationship set. (4 mark)
- ii. Give an example for composite attribute. (2 mark)
- c. Briefly explain the weak entity set with an example. (4 mark)
- d. A university consists of number of departments. Each department offers several courses. A number of modules make up each course. Students enroll in a particular course and take modules towards the completion of that course. Each module is taught by a lecturer from the appropriate department, and each lecturer tutors a group of students.
- i. Identify the entity sets and relationships for the given scenario. (6 mark)
- ii. Draw the mapping cardinalities between the entity sets which you have defined in part i. (7 mark)

4.

- a. What are the **ACID** properties in DBMSs? (4 mark)
- b. Explain the following relational algebraic expression. (3 mark)
- $$\sigma_{\text{subject} = \text{"database"} \text{ and price} = \text{"450"} \text{ or year} > \text{"2010"}(\text{Books})$$
- c. Explain how you protect the database from intentional and accidental threats. (8 mark)
- d. Convert the following ER diagram (Figure 2) to relational schemas. (10 mark)

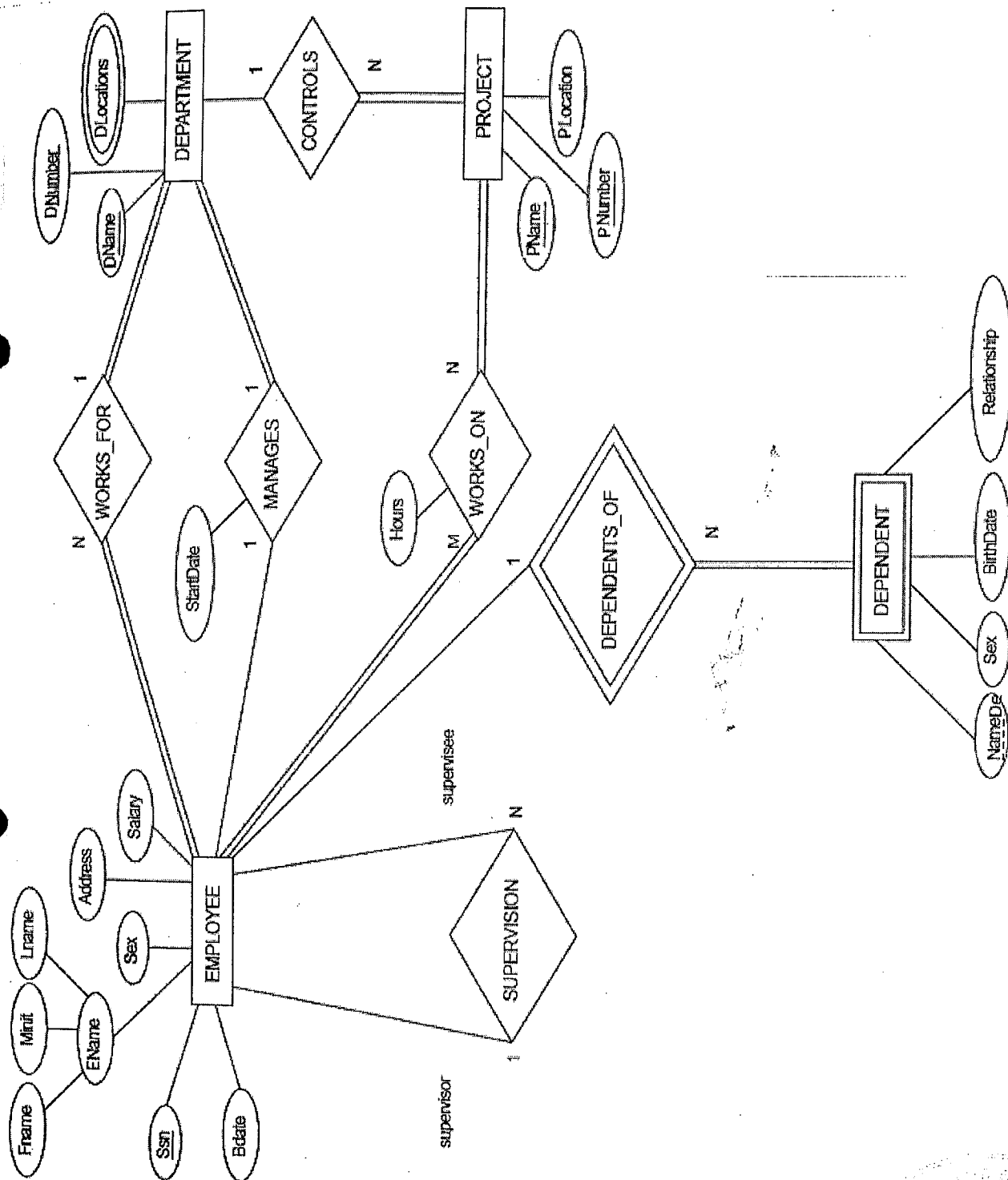


Figure 2: ER diagram of ABC Company

