

### Question 1

10 pts

Which characteristic does not describe a relation?

- ☐ The name of attribute cannot more than once in a relation.
- ☐ None of the above
- ☒ A relation can have a multivalued attribute.
- ☐ The location of a tuple in a relation does not affect the interpretation of the attribute values.

### Question 2

10 pts

Which statement about entity and attribute is correct?

- ☐ An entity is an aspect of the attribute that we want to keep track of.
- ☐ An entity cannot have composite attributes.
- ☒ An attribute is one aspect of the entity that we want to keep track of.
- ☐ A composite attribute should be depicted in the ERD as an entity.

### Question 3

10 pts

What can an ED diagram be used for?

- i. It can determine whether the data requirements are correct.
- ii. It documents the data requirements pictorially.
- iii. It can be used to communicate with users about the data requirements gathered thus far.
- iv. It can help uncover missing data requirements.

- ☐ ii, iii and iv
- ☐ ii and iii
- ☐ i and iv
- ☒ i, ii, iii and iv

#### Question 4

10 pts

Given this scenario: A customer can make many purchases, and each purchase is for one or more items. Each purchased item is sold at the current price of the corresponding item sold by a company. The current price of an item changes over time, and each item is supplied by several suppliers.

Which aspect of this scenario shows the N:M strong pattern?

- ☐ The relationship between customer and purchase
- ☐ The relationship between purchase and purchased item
- ☒ The relationship between supplier and item
- ☐ The relationship between purchased item and item

#### Question 5

10 pts

What is the purpose of normalisation?

- ☐ Improve speed of retrieving data
- ☐ Eliminate data redundancy
- ☒ Eliminate modification anomalies
- ☐ Allow proper data analysis

#### Question 6

10 pts

Which statement(s) is(are) true about an id-dependent entity?

- i. An id-dependent entity has a composite identifier.
- ii. An id-dependent entity does not have an identifier.
- iii. An id-dependent entity has the same identifier as the entity whose existence it is dependent on.

- ☐ Only statement ii
- ☐ All 3 statements
- ☐ Only statement iii
- ☒ Only statement i

### Question 7

10 pts

Given the scenario: A customer can make many purchases, and each purchase is for one or more items. Each purchased item is sold at the current price of the corresponding item sold by a company. The current price of an item changes over time, and each item is supplied by several suppliers.

Which aspect of this scenario can show the line-item pattern?

- i. The relationship between customer and purchase
- ii. The relationship between purchase and purchased item
- iii. The relationship between purchased item and item
- iv. The relationship between supplier and item

☒ ii and iii

☐ ii, iii and iv

☐ i, ii, iii and iv

☐ i and ii

### Question 8

10 pts

Determine the candidate key(s) for the relation  $R(A, B, C, D)$ , given the functional dependency and multi-valued dependency:

i.  $A \twoheadrightarrow B$

ii.  $A \rightarrow C, D$

☐ There is one candidate key: B

☐ There are two candidate keys: A and B

☒ There is one composite candidate key: (A, B)

☐ There is one candidate key: A

**Question 9****10 pts**

Why is the design of a database an important consideration?

- ☐ It ensures that the database can be properly backed up and restored.
- ☒ It helps with data consistency
- ☐ All of the above
- ☐ It determines what data can be stored

**Question 10****10 pts**

Determine the set of relations in 3NF and 4NF for the relation  $R(A, B, C, D)$  and the functional dependency and multi-valued dependency:

- i.  $A \twoheadrightarrow B$
- ii.  $A \rightarrow C, D$

- ☒  $R_1(A, C, D)$  with primary key  $A$ , and  $R_2(A, B)$  with composite primary key  $(A, B)$ , and foreign key  $A$ .
- ☐  $R_1(A, C, D)$  with primary key  $A$  and foreign key  $A$ , and  $R_2(A, B)$  with composite primary key  $(A, B)$ .
- ☐  $R(A, B, C, D)$  with composite primary key  $(A, B)$
- ☐  $R_1(A, C, D)$  with primary key  $A$ , and  $R_2(B, C, D)$  with primary key  $B$