

Databases Final Exam Practice

ER-Relational Mapping, SQL, Relational Design, Physical DMBS Design

Name: _____

GT account (gtg, gth, msmith3, etc): _____ Section (e.g., B1): _____

Signature: _____

- Failure to properly fill in the information on this page will result in a deduction of up to 4 points from your exam score.
- Signing signifies that you agree to comply with the **Academic Honor Code of Georgia Tech**.
- Calculators and cell phones are NOT allowed.

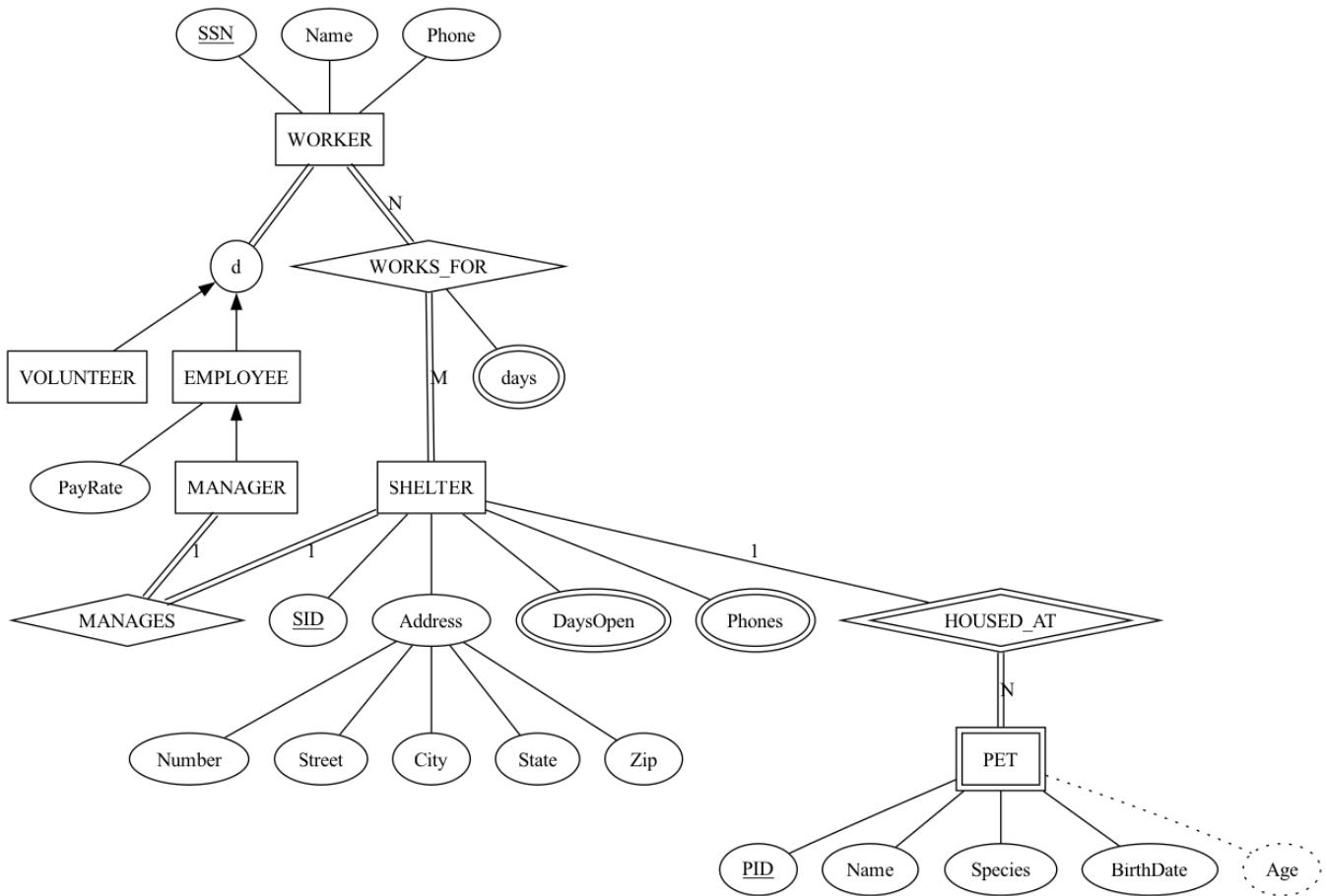
Completely fill in the box corresponding to your answer choice for each question.

1. [A] [B] [C] [D]
2. [A] [B] [C] [D]
3. [A] [B] [C] [D]
4. [A] [B] [C] [D]
5. [A] [B] [C] [D]
6. [A] [B] [C] [D]
7. [A] [B] [C] [D]
8. [A] [B] [C] [D]
9. [A] [B] [C] [D]
10. [A] [B] [C] [D]
11. [A] [B] [C] [D]
12. [A] [B] [C] [D]
13. [A] [B] [C] [D]
14. [A] [B] [C] [D]
15. [A] [B] [C] [D]
16. [A] [B] [C] [D]
17. [A] [B] [C] [D]
18. [A] [B] [C] [D]
19. [A] [B] [C] [D]
20. [A] [B] [C] [D]
21. [A] [B] [C] [D]
22. [A] [B] [C] [D]
23. [A] [B] [C] [D]
24. [A] [B] [C] [D]
25. [A] [B] [C] [D]

Number missed: _____ Written Score: _____

Name: _____ Student account (e.g., msmith3): _____
 Section: _____

Refer to the following EER diagram for Questions 1 – 7



Name: _____ Student account (e.g., msmith3):
Section: _____

- [4] 1. Which of the following (sets of) relation schemas is a correct mapping of the SHELTER entity type? (Disregard the MANAGES relationship.)
- SHELTER(SID, Number, Street, City, State, Zip, DaysOpen, Phones)
 - SHELTER(SID, Number, Street, City, State, Zip, Phones), DaysOpen(SID, Day)
 - SHELTER(SID, Number, Street, City, State, Zip), DaysOpen(SID, Day), Phones(SID, Phone)
 - All of the above.
- [4] 2. Which of the following relation schemas is a correct mapping of the PET entity type?
- PET(PID, Name, Species, BirthDate, Age)
 - PET(PID, Name, Species, BirthDate)
 - PET(PID, SID, Name, Species, BirthDate)
 - None of the above
- [4] 3. Which of the following sets of relation schemas is a correct mapping of the WORKS_FOR relationship (Disregard multivalued attributes of SHELTER.)?
- WORKER(SSN, Name, Phone, SID), SHELTER(SID, Number, Street, City, State, Zip)
 - WORKER(SSN, Name, Phone), SHELTER(SID, Number, Street, City, State, Zip, SSN)
 - WORKER_SHELTER(SSN, SID), WORK_DAYS(SSN, SID, Day)
 - WORKER_SHELTER(SSN, SID, Days)
- [4] 4. What's the least number of tables necessary to model the WORKER - VOLUNTEER - EMPLOYEE - MANAGER class hierarchy?
- 1
 - 2
 - 3
 - 4
- [4] 5. Which of the following sets of relation schemas acceptably represent the WORKER - VOLUNTEER - EMPLOYEE - MANAGER class hierarchy?
- WORKER(SSN, Name, Phone), VOLUNTEER(SSN), EMPLOYEE(SSN, PayRate), MANAGER(SSN)
 - EMPLOYEE(SSN, Name, Phone, PayRate, IsManager), VOLUNTEER(SSN)
 - WORKER(SSN, Name, Phone, PayRate, IsManager)
 - All of the above.
- [4] 6. Which of the following create table statements creates a PET table that accurately models the PET entity type?
- create table pet(PID int primary key, Name varchar(20), Species varchar(20), Birthdate date)
 - create table pet(PID int primary key, Name varchar(20), Species varchar(20), Birthdate date, SID int)
 - create table pet(PID int, Name varchar(20), Species varchar(20), Birthdate date, SID int, primary key (PID, SID), foreign key (SID) references shelter(SID))
 - None of the above.
- [4] 7. Which of the following create table statements creates a table that accurately models the WORKS_FOR relationship? (Disregard multivalued attributes.)
- create table worker_shelter(SSN int, SID int, days enum (M, Tu, W, Th, F))
 - create table worker_shelter(SSN int, SID int, primary key (SSN, SID), foreign key (SSN) references worker (SSN), foreign key (SID) references shelter (SID))
 - create table worker_shelter(SSN int, SID int, primary key (SSN))
 - None of the above.

Name: _____ Student account (e.g., msmith3):
Section: _____

Refer to the following create table statements and table data for Questions 8 – 10.

```
create table dorm (
    dorm_id integer primary key auto_increment,
    name text not null,
    spaces integer
);

create table student (
    student_id integer primary key auto_increment,
    name text,
    gpa float(3,2),
    dorm_id integer not null,
    foreign key (dorm_id) references dorm(dorm_id)
);
```

```
mysql> select * from dorm;
+-----+-----+-----+
| dorm_id | name      | spaces |
+-----+-----+-----+
|      1 | Armstrong |    124 |
|      2 | Brown     |    158 |
+-----+-----+-----+
2 rows in set (0.00 sec)
```

```
mysql> select * from student;
+-----+-----+-----+-----+
| student_id | name   | gpa   | dorm_id |
+-----+-----+-----+-----+
|          1 | Alice  | 3.60  |      1 |
|          2 | Bob    | 2.70  |      1 |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

[4] 8. Which of the following insert statements will succeed?

- A. `insert into dorm (name, spaces) values('Caldwell', 158);`
- B. `insert into dorm values('Caldwell', 158);`
- C. `insert into dorm (name, spaces) values(null, 158);`
- D. All of the above.

[4] 9. Which of the following insert statement is certain to succeed?

- A. `insert into student (name, gpa, dorm_id) values ('Cheng', 3.6, 3);`
- B. `insert into student (name, gpa, dorm_id) values ('Cheng', 3.6, 1);`
- C. `insert into student (name, gpa) values ('Cheng', 3.6);`
- D. All of the above.

[4] 10. Which of the following delete statements will fail?

- A. `delete from student`
- B. `delete from dorm where name = 'Brown';`
- C. `delete from dorm where name = 'Armstrong';`
- D. None of the above.

Pubs Database Schema

author(author_id, *first_name*, *last_name*)

author_pub(author_id, pub_id, *author_position*)

book(book_id, *title*, *month*, *year*, *editor*)

pub(pub_id, *title*, book_id)

- *author_id* in *author_pub* is a foreign key referencing *author*
- *pub_id* in *author_pub* is a foreign key referencing *pub*
- *book_id* in *pub* is a foreign key referencing *book*
- *editor* in *book* is a foreign key referencing *author*(*author_id*)
- Primary keys are underlined

Pubs Database State

r(author)

author_id	first_name	last_name
1	John	McCarthy
2	Dennis	Ritchie
3	Ken	Thompson
4	Claude	Shannon
5	Alan	Turing
6	Alonzo	Church
7	Perry	White
8	Moshe	Vardi
9	Roy	Batty

r(author_pub)

author_id	pub_id	author_position
1	1	1
2	2	1
3	2	2
4	3	1
5	4	1
5	5	1
6	6	1

r(book)

book_id	title	month	year	editor
1	CACM	April	1960	8
2	CACM	July	1974	8
3	BST	July	1948	2
4	LMS	November	1936	7
5	Mind	October	1950	NULL
6	AMS	Month	1941	NULL
7	AAAI	July	2012	9
8	NIPS	July	2012	9

r(pub)

pub_id	title	book_id
1	LISP	1
2	Unix	2
3	Info Theory	3
4	Turing Machines	4
5	Turing Test	5
6	Lambda Calculus	6

Figure 1: Pubs Database

Name: _____ Student account (e.g., msmith3):
Section: _____

For the questions on this page, refer to Figure 1.

- [4] 11. Query giving author first name and last name who have published in CACM.
- A.
 - B.
 - C.
 - D.
- [4] 12. Query giving all authors and the books they have edited, including authors who are not book editors.
- A.
 - B.
 - C.
 - D.
- [4] 13. Query giving all author first names and last names who have published more than one pub.
- A.
 - B.
 - C.
 - D.
- [4] 14. Author of the oldest pub in the database.
- A.
 - B.
 - C.
 - D.
- [4] 15. How many rows returned by `select * from book natural join pub`?
- A.
 - B.
 - C.
 - D.

Name: _____ Student account (e.g., msmith3):
Section: _____

Physical DMBS Design

[4] 16. Storage

- A.
- B.
- C.
- D.

[4] 17. Indexing

- A.
- B.
- C.
- D.

[4] 18. Query processing

- A.
- B.
- C.
- D.

[4] 19. Transaction processing

- A.
- B.
- C.
- D.

[4] 20. ?

- A.
- B.
- C.
- D.