

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.

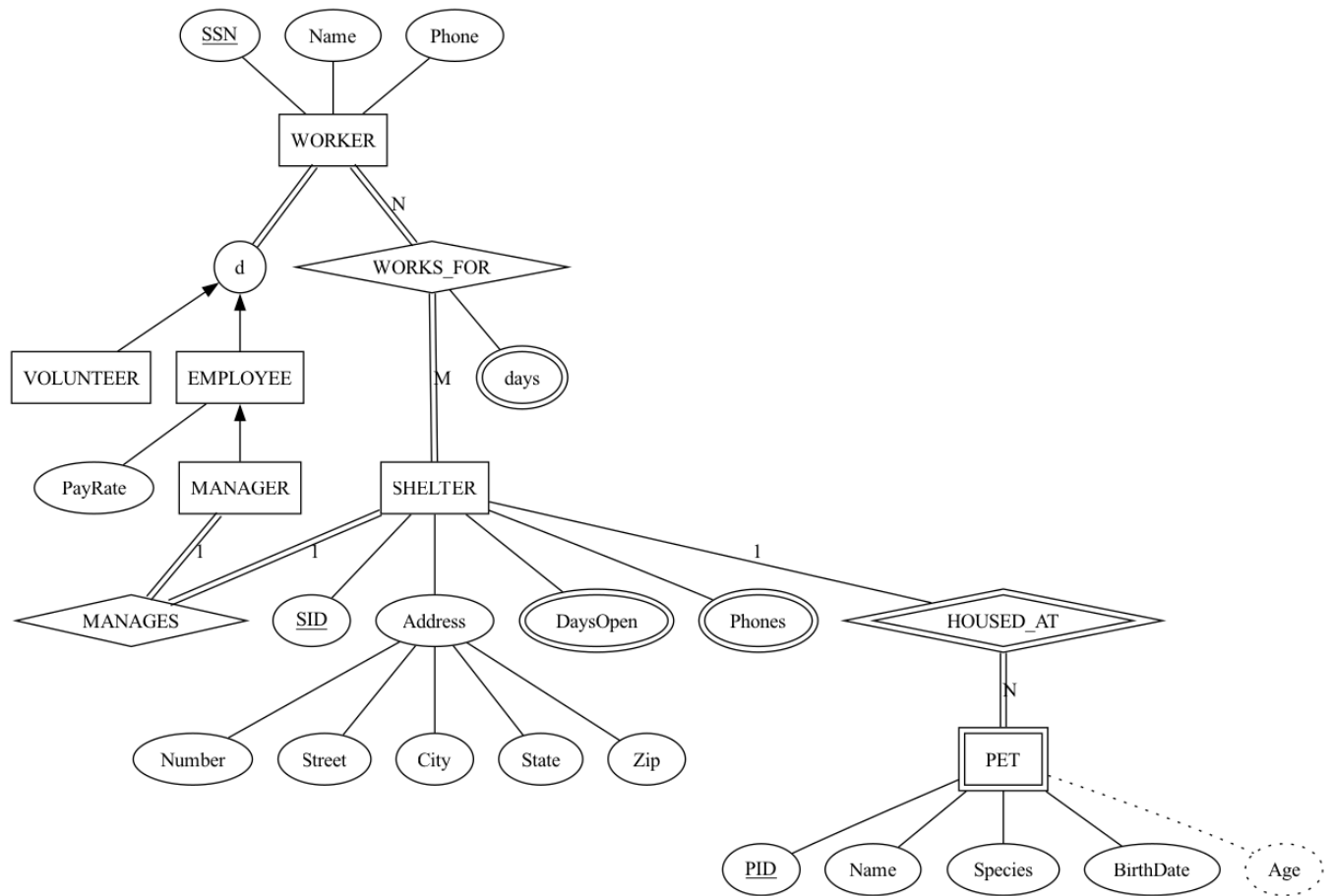
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|-----|-------|-------|-------|-------|
| 1. | [A] | [B] | [C] | [D] |
| 2. | [A] | [B] | [C] | [D] |
| 3. | [A] | [B] | [C] | [D] |
| 4. | [A] | [B] | [C] | [D] |
| 5. | [A] | [B] | [C] | [D] |
| 6. | [A] | [B] | [C] | [D] |
| 7. | [A] | [B] | [C]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

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)

<u>author_id</u>	<u>first_name</u>	<u>last_name</u>
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)

<u>author_id</u>	<u>pub_id</u>	<u>author_position</u>
1	1	1
2	2	1
3	2	2
4	3	1
5	4	1
5	5	1
6	6	1

r(book)

<u>book_id</u>	<u>title</u>	<u>month</u>	<u>year</u>	<u>editor</u>
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)

<u>pub_id</u>	<u>title</u>	<u>book_id</u>
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.