

Point: 20 (each question is 1 point)

Part 1 (Listen to the Video lecture on DB Internals and answer following questions):

1. What is the typical size of Disk Block?
(a) 64 bytes
(b) 8K bytes
(c) 64K bytes
(d) 4K bits
2. Database file can have at most one Disk Block? True/(**False**)
3. Which search strategy works better if database is on hard drive?
(a) Multiple access times and small transfer time
(b) Single access time and large transfer time
4. Table records can be sorted on multiple attributes of the table? True/(**False**)
5. In sequential file organization, records are sorted/ordered according to the value of one attribute ("Search Key"). Should Search Key always be primary key of the table?
(a) Yes
(b) No
(c) Does not matter (Search key can be any attribute)

Part 2: SQL questions

The following queries are based on the 1994 census data (1994-census-summary.sql)

6. which native countries have "land" in their name?

```
select distinct native_country from census where native_country like '%land%';
```
7. what is the average education years for people having a native country that is not the US?

```
select avg(education_num) from census where native_country != "United_States";
```
8. how many different native countries are found in the data set?

```
select count(distinct native_country) from census;
```

Part 3: SQL questions

The following queries are based on the courses-ddl.sql and courses-small.sql data

9. what are the names of all students who have taken some course? Don't show duplicates.

```
select distinct name from student natural join takes;
```

10. what are the names of departments that offer 4-credit courses? Don't list duplicates.

```
select distinct dept_name  
from department natural join course  
where credits = 4;
```

11. How many B grades have been given to physics majors?

```
select count(*)  
from student natural join takes  
where dept_name = "Physics" and grade="B";
```

12. What is the average total credits of students who have taken CS-319?

```
select avg(tot_cred)  
from student natural join takes  
where course_id = "CS-319";
```

13. What is the average total credits of students who have taken CS-101?

```
select avg(tot_cred)  
from student natural join takes  
where course_id = "CS-101";
```

14. What are the course IDs of courses taught by instructor Katz?

```
select course_id
from instructor natural join teaches
where name="Katz";
```

15. What are the course IDs of all courses offered by instructor Crick's department?

```
select course_id
from instructor natural join department natural join course
where name="Crick";
```

Extra Credit:

16. What is the course_id, semester, and year of sections of computer science courses?

Don't show duplicates.

```
select distinct course_id, semester, year
from department natural join course natural join section
where dept_name = "Comp. Sci.";
```