# ISM 6205 Physical Database Design Question 2 Fall 2019 10 points

Consider the following database:

Patient (PatientId, PatName, PatPhone, PatEmail, PatIns, PatRelative)

Immunization (ImmunCode, ImmunType, ImmunDesc)

Immun\_Rec (Immun\_Rec\_Id, PatientId, ImmunCode, Immun\_Date, Immun\_Reaction)



Assume scan time/block is 1 ms and random access time is 10 ms. The size of a block is 8K. *Ignore indexing if the scan time is below .25 seconds.*

Assume the following number of records and size of a record in each file of the active database ( 2 points):

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table Name** | **Number Recs** | **Size (bytes)** | **Bf** | **No. of Blocks** | **Scan Time(s)** |
| Patient | 100,000 | 400 | 20 | 5000 | 5 |
| Immunization | 1,000 | 200 | 40 | 25 | 0.025 |
| Immun\_Rec | 1,000,000 | 200 | 40 | 25000 | 25 |

The following are the distinct values for some of the attributes:

PatName: 20,000; Immun\_Reaction: 10

*You don’t have any other information*.

Answer the following (and show the calculations; 2 points each):

1) Consider access through the following attributes in a single-table query with restrict condition of type *attribute = value*:

|  |  |  |  |
| --- | --- | --- | --- |
| Field | No. of Records Touched (n) | Index Time | Index (I) or Scan (S) |
| Immun\_Rec. PatientId | 1,000,000/100,000=10 | (10+2)\*10ms=120ms | I |
| ImmunType | Small table | N/A | S |
| Immun\_Reaction | 1,000,000/10=100,000 | 1,000s | S |
| PatName | 100,000/20,000=5 | (5+2)\*10ms=70ms | I |