Question 1:

a) 4 queries

w 3 sql statements bey create fihom indices 3la fields mo5talefa men el table w matloob enak t2ool b3d ma 3mlna el indices dy kol query hatkoon faster wala would stay the same .

b) so2al men 5 parts 3la el 2 phase locking :

1st part: Give an example that shows that using ordinary locks without enforcing 2 phase locking rules would not guarantee a conflict serializable graph

2nd part: True or False and prove: 2 phase locking guarantees conflict serializability

3rd part: Does 2 phase locking always guarantee no deadlocks? eddy example bayen w 2ool esm version menno bet guarantee en mafeesh deadlocks

4rd part: wa7ed mesh fkrah :D bas howa 3'aleban kan leeh 3laka bel strict version of 2 phase locking

5th part: leh maynf3sh nesta5dem el 2 phase locking with structures zay el B+ trees

Question 2:

Gayeblak Transaction mokawan men :

Write Object (A)

Write Object (B)

Commit

w b3dein medeek snapshots keteera keda lel state beta3et el log wel database 3l disk w t2ool l kol wa7da hal da possible en ykoon feeh such a snapshot at any point of time during the execution of the transaction aw after it ends wala impossible f 7alet enny basta5dem :

1-Deferred Update

2-Immediate Update

(m3 el 3elm en law 7aga mesh mentioned enaha etkatabet fel db yb2a m3nah enaha matkatbetsh)

example men el snapshots:

-The log contains a record for Write A and the database contains the value of A

(A3taked 3la 7ad 3elmy en dy maslan haykoon egabet-ha possible fel immediate bas impossible fel deferred 3shan lazem yestanna y7sal commit fa madam ma3ndeesh fel screenshot dy record el log lel commit dy yb2a maynf3sh fel deferred ykoo da 7asal)

-The database contains the value of A

-The log contains Write A and Commit and the Database contains the value of A

-The log contains Write A , Write B , Commit and the database contains the value of A

-The log contains Write A, Write B and the database contains the value of A

Question 3:

a) Given a table fel db w Transaction 1 and Transaction 2 el etnein bey insert w y delete menno bas homma interleaved . (T1 lama byeegy y delete beyb2a record T2 3amalo insertion w nafs el kalam bardo T2 lama by delete bykon record T1 3amalo insertion)

2ool el table haykoon feeh eh b3d ma el transactions te5alas law el isolation level kan **READ COMMITTED**

b) so2al 3n el **ARIES** matloob:

1- Dirty page table wel transaction table tektebhom b3d el analysis

2- t2ool eh el transactions ely hayt3melaha redo wel redo haybda2 menein w keda

3-eh el transactions ely hayt3melaha undo w kam so2al tanny 3n el undo step mesh fakrah :D (kollo f nafs el so2al y3ni)

Question 4:

a) Compare between NoSQl and SQL ka points (just listing 3 points in each) men na7yet :

-Distributed System :

-Data Model:

b) el NoSQL bey guarantee eventual consistency mesh zay el relational DBMS bey follow el ACID

what does that mean? (7aga bel m3na da :D)

c) hal kol el forms bta3et el NOSQL bet follow eventual consistency wala feeh 7agat bet7tag stronger form ? discuss

d) so2al Kaman mesh fakrah :D bas bardo f 7etet el ACID wel consistency wel kalam da 7awlo tefhamooha w te7fazooha kwayes.

Question 5:

Beta3 15 true or false keda