Advanced Database Management System Quiz 2

Total points 19/21

Full Marks: 26
Duration: 30 minutes
All fields are mandatory
Please write your Name and Admission Number Correctly.
Note-Question A(i) and A(ii) are linked question. If Question A(i) is wrong no marks will be given for A(ii)

The respondent's email (**21mt0214@cse.iitism.ac.in**) was recorded on submission of this form.

Name *

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Admission No. *

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✓ Choose the correct option(s) * 2/2

1. An attributes value is either a literal or an object identifier.
2. Literlas do not have identifiers, and therefore can not be individually referenced like objects.
3. The object Model supports different literal types, but does not support atomic literals, collection literals, and structure literals.
4. In ODL you specify an operation using parantheses after its name.

- [ ] 1->T,2->F,3->F,4->F
- [ ] 1->T,2->T,3->T,4->T
- [ ] None
- [ ] 1->T,2->T,3->F,4->F
- [ ] 1->T,2->T,3->T,4->F
- [ ] 1->F,2->F,3->F,4->F
- [x] 1->T,2->T,3->F,4->T ✓

✓ Choose the correct option(s). * 1/1

1. If you know all the possibile values that an attribute can have, you can enumerate those values in ODL.
2. An attribute's value is always literals.

- [x] 1->T,2->T ✓
- [ ] 1->T,2->F
- [ ] 1->F,2->T
- [ ] 1->F,2->F
- [ ] None

✓ An object can have which of the following multiplicities? 1/1

- [x] zero ✓
- [x] one ✓
- [x] More than one ✓

✓ Which of the following scenarios may lead to an irrecoverable error in a database system? * 1/1

- [ ] A transaction reads a data item after it is written by a committed transaction
- [ ] A transaction writes a data item after it is read by an uncommitted transaction
- [x] A transaction reads a data item after it is written by an uncommitted transaction ✓
- [ ] A transaction reads a data item after it is read by an uncommitted transaction

✓ The highest degree of concurrency in a relational database can be achieved through the following * 1/1

- [ ] Page level locking
- [ ] Table level locking
- [x] Row level locking ✓
- [ ] Page and row level locking allow the same degree of concurrency.
- [ ] Page and table level locking allow the same degree of concurrency.
- [ ] Page, table and row level locking allow the same degree of concurrency.
- [ ] None of the options are correct.

✓ Chose the correct option(s) * 2/2

- [x] A top to bottom relationship among the items in a database is established by a Hierarchical schema ✓
- [ ] A top to bottom relationship among the items in a database is established by a Network schema
- [ ] A top to bottom relationship among the items in a database is established by a Relational schema
- [ ] A transaction log shows before and after images of records that have been modified by transactions.
- [ ] With concurrent processing involving updates, a database with concurrency control will be compromised due to interference between users.

✓ Chose the correct option(s) * 1/1

- [ ] None of the options are correct
- [x] In ACID properties of a transaction, the 'Durability' property requires that the changes made to the database by a successful transaction persist always, even if there is a failure of any kind ✓
- [ ] In ACID properties of a transaction, the 'Durability' property requires that the changes made to the database by a successful transaction persist except in case of a Disk crash
- [ ] In ACID properties of a transaction, the 'Durability' property requires that the changes made to the database by a successful transaction persist except in case of an Operating System crash
- [ ] In ACID properties of a transaction, the 'Durability' property requires that the changes made to the database by a successful transaction persist except in case of a power failure

✓ Conflict serializability and freedom from deadlock can be achieved through * 2/2

- [ ] Neither 2-phase locking nor Time-stamp ordering
- [x] Time-stamp ordering ✓
- [ ] Time-stamp ordering only
- [ ] 2-phase lockingI only
- [ ] Both 2-phase locking and Time-stamp ordering
- [ ] 2-phase locking

✓ Chose the correct option(s). * 2/2

Consider the following transaction involving two bank accounts a and b.
read (a) ; a: = a - 50; write (a); read (b); b: = b + 50; write (b)

- [x] The constraint that the sum of the accounts a and b should remain constant is that of consistency only ✓
- [ ] The constraint that the sum of the accounts a and b should remain constant is that of atomicity and durability Durability
- [ ] The constraint that the sum of the accounts a and b should remain constant is that of atomicity and Isolation
- [ ] The constraint that the sum of the accounts a and b should remain constant is that of durability only
- [ ] The constraint that the sum of the accounts a and b should remain constant is that of isolation only
- [ ] None of the options are correct.
- [ ] The constraint that the sum of the accounts a and b should remain constant is that of atomicity only

✓ A(i). Chose the correct option(s) 2/2

Consider a database schedule Sh involves transactions $T_1,...,T_n$. Construct the precedence graph of S with vertices representing the transactions and edges representing the conflicts. If S is serializable, which one of the following orderings of the vertices of the precedence graph is guaranteed to yield a serial schedule?

- [ ] Depth-first order and Breadth-first order
- [ ] Depth-first order
- [ ] Ascending order of transaction indices
- [ ] Breadth-first order
- [ ] Topological order and Depth-first order
- [ ] None of the options are correct.
- [ ] Topological order and Breadth-first order
- [x] Topological order ✓

✓ A(ii). Justify the Question A(i) 2/2

Consider a database schedule Sh involves transactions $T_1,...,T_n$. Construct the precedence graph of Sh with vertices representing the transactions and edges representing the conflicts. If Sh is serializable, which one of the following orderings of the vertices of the precedence graph is guaranteed to yield a serial schedule?

There is cycle in precedence graph tell that schedule is not conflict serializable. DFS and BFS are also possible non serializable graph but here topological sort of any cyclic graph is guarantees graph is serializable. That's why topological order is the only possible answer in above question.

✓ Chose the correct option(s) * 2/2

A. Strict two-phase locking protocol generates conflict serializable schedules that are also recoverable.

B. Timestamp-ordering concurrency control protocol with Thomas Write Rule can generate view serializable schedules that are not conflict serializable.

- [ ] A only
- [ ] B only
- [x] A ✓
- [x] B ✓
- [ ] Neither A nor B

✗ *

0/2

For the schedule given below whichof the following is correct?

T_1	T_2
Read(X)	
	Read(Y)
Write(X)	
	Read(X)
	Write(X)
	Write(Y)
Read(Y)	
Write(Y)	

- [x] This schedule is serialized and can occur in a scheme using 2PL protocol. ✗
- [ ] This schedule is not serializable but can occur in a scheme using 2PL protocol.
- [ ] This schedule is serializable but cannot occur in a scheme using 2PL protocol.
- [ ] This schedule is not serializable and cannot occur in a scheme using 2PL protocol.

Correct answer

- [x] This schedule is not serializable and cannot occur in a scheme using 2PL protocol.