SECTION: _____ NAME: _____ ROLL NUMBER: _____

ADVANCED DATABASES FINAL EXAM OBJECTIVE PART

[Spring 2014] [Total Points: 20] [Time: 30 min.]

Question

ENCIRCLE THE BEST OPTION FOR EACH OF THE FOLLOWING:

1) Which of the following are cost components for query execution?
a. access cost to secondary storage
b. computation cost
c. memory usage cost
d. communication cost
e. all of the above

2) Which of the following factors affecting JOIN performance?
a. available buffer space
b. join selection factor
c. choice of inner VS outer relation
d. all of the above
e. none of the above

3) Which of the following uses constraints specified on the database schema in order to modify one query into another query that is more efficient to execute?
a. tule-based query optimization
b. cost-base query optimization
c. semantic query optimization
d. heuristic query optimization
e. all of the above

4) Consider the following query:
SELECT title FROM book
WHERE year < 2000 AND author = 'C J Date';
Which of the following access paths would the rule-based optimizer choose? (The highest ranked among the available paths).
a. full Table Scan
b. index on BOOK(author)
c. unique Index on BOOK(id)
d. index on BOOK(year)
e. all of the above

5) You need to sort a relation of *B* blocks. What is the minimum number of in-memory buffers required to sort the relation in two passes?
a. B/4
b. B/2
c. B
d. 2B
e. 4B

6) Suppose you have to access 5% of the rows of a large table (significantly larger than your buffer cache). Each block contains about 50 rows. You do not know anything about the distribution of the rows among the blocks (i.e. assume that they are equally distributed). Which access method is more efficient?
a. full table scan
b. index scan and table access by ROWID
c. both a and b methods are approximately equally efficient
d. cannot access rows due to insufficient buffer cache
e. none of the above

7) Suppose your system is short in main memory, but the operating system supports paging (virtual memory, it can swap out pages or entire processes). Would it then improve the DBMS performance to further increase the size of the buffer cache?
a. Yes, the performance improves
b. The performance will even decrease
c. This has no influence on the performance
d. all of the above
e. none of the above

8) What information is temporarily stored in the db buffer cache?
a. Blocks containing table data
b. Blocks containing index data
c. Blocks containing table data and index data
d. Blocks containing application programs written in C
e. Blocks containing program code of the DBMS itself (e.g. the procedure for doing a hash join)

9) Consider the following query:
SELECT * FROM customer
WHERE cust_No > 3000 AND name = 'Izaan'
AND address LIKE '%Model Town%'
Which of the following access paths would the rule-based optimizer choose? (The one ranked highest among the possible ones):
a. full Table Scan
b. unique Index on CUSTOMER(cust_No)
c. index on CUSTOMER(address)
d. index on CUSTOMER(name)
e. all of the above

10) Consider again the table BOOK (id, title, year, author, publisher). Suppose you have created a B-tree index with the command
CREATE INDEX i_book_auth_year ON BOOK (author, year). Which of the following conditions can be evaluated using the index (and not doing a full index scan)?
a. author = 'C J Date'
b. YEAR > 1980
c. author = 'C J Date' AND year >1980
d. UPPER(author) LIKE '%DAT%'
e. a and c
f. a and b

11) Suppose you accidentally deleted an index. Will your application programs which previously used this index still run (maybe slower)?
a. they will run, but probably faster
b. they will run, but probably slower
c. they will not run
d. the end user will not note any difference (also not in response time)
e. none of the above

12) When using a log-based recovery scheme, it might improve performance as well as providing a recovery mechanism by
a. writing the log records to disk when each transaction commits
b. writing the appropriate log records to disk during the transaction's execution
c. waiting to write the log records until multiple transactions commit and writing them as a batch
d. never writing the log records to disk
e. all of the above

13) Which of the following will prevent ARIES from repeating the completed undo operations if a failure occurs during recovery, which causes a restart of the recovery process?
a. repeating history during redo
b. logging changes during undo
c. write ahead logging (WAL)
d. all of the above
e. none of the above

14) The write ahead log rule is that
a. a Log must be maintained for all occurring transactions
b. a log must be physically written to disk after the commit
c. a log must be physically written to disk before the commit processing can complete
d. all of the above
e. none of the above

15) In ARIES recovery algorithm, which of the following is a writing approach?
a. no-steal/force
b. no-steal/no-force
c. steal/force
d. steal/no-force
e. none of the above

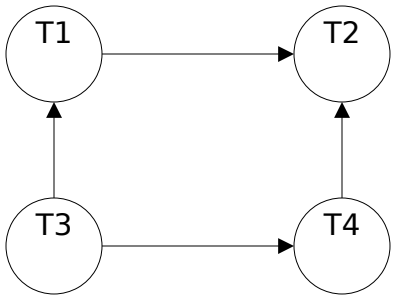
16) There is a possibility of a cascading rollback when
a. a transaction reads an item that is previously written by an uncommitted transaction
b. a transaction writes an items that have been written only by a committed transaction
c. a transaction reads an items that have been written only by a committed transaction
d. all of the above
e. none of the above

17) In non-repeatable read
a. a transaction reads uncommitted data from another transaction
b. a transaction reads a data twice with different results
c. if a transaction reads some data, that is kept in the buffer and not read again
d. if a transaction reads some rows that were not read when the same transaction was made earlier.
e. none of the above

18) If a transaction uses the 'repeatable read' isolation level, which of the following violation is possible?
a. dirty read
b. nonrepeatable read
c. phantom
d. all of the above
e. none of the above

19) According to the wound-wait policy of avoiding deadlocks, if a transaction Ti requests a lock and Tj holds a conflicting lock. What would happen if Ti < Tj
a. Ti waits till Tj completes
b. Ti is granted a shared lock with Tj
c. Ti is aborted
d. Tj is aborted and Ti is granted the lock
e. none of the above

20) Consider the following precedence graph. Which of the following serial schedule can be identified from this graph?



a. T3 T1 T4 T2
b. T3 T4 T1 T2
c. T3 T1 T2 T4
d. T4 T3 T1 T2
e. a and b
f. b and c