<A>APPENDIX A

<B>Example Interview Questions for Oracle Candidates

<A>Interview Questions for Oracle, DBA, Developer Candidates

Score each question on a 1-5 or 1-10 scale.

<B>DBA Sections: SQL/SQLPLUS, PL/SQL, Tuning, Configuration, Trouble shooting
<B>Developer Sections: SQL/SQLPLUS, PL/SQL, Data Modeling
<B>Data Modeler: Data Modeling
<B>All candidates for UNIX shop: UNIX

<B>PL/SQL Questions:

1. Describe the difference between a procedure, function and anonymous pl/sql block.
Level: Low

Expected answer: Candidate should mention use of DECLARE statement, a function must return a value while a procedure doesn't have to.

Score: _____   Comment:
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2. What is a mutating table error and how can you get around it?
Level: Intermediate

Expected answer: This happens with triggers. It occurs because the trigger is trying to update a row it is currently using. The usual fix involves either use of views or temporary tables so the database is selecting from one while updating the other.

Score: _____   Comment:
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3. Describe the use of %ROWTYPE and %TYPE in PL/SQL
Level: Low

Expected answer: %ROWTYPE allows you to associate a variable with an entire table row. The %TYPE associates a variable with a single column type.

Score: _____   Comment:
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4. What packages (if any) has Oracle provided for use by developers?
Level: Intermediate to high

Expected answer: Oracle provides the DBMS_ series of packages. There are many which developers should be aware of such as DBMS_SQL, DBMS_PIPE, DBMS_TRANSACTION, DBMS_LOCK, DBMS_ALERT, DBMS_OUTPUT, DBMS_JOB, DBMS_UTILITY, DBMS_DDL, UTL_FILE. If they can mention a few of these and describe how they used them, even better. If they include the SQL routines provided by Oracle, great, but not really what was asked.

Score: _____   Comment:
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5. Describe the use of PL/SQL tables

Level: Intermediate

Expected answer: PL/SQL tables are scalar arrays that can be referenced by a binary integer. They can be used to hold values for use in later queries or calculations. In Oracle 8 they will be able to be of the %ROWTYPE designation, or RECORD.

Score: _____   Comment:
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6. When is a declare statement needed ?
Level: Low

The DECLARE statement is used in PL/SQL anonymous blocks such as with stand alone, non-stored PL/SQL procedures. It must come first in a PL/SQL stand alone file if it is used.

Score: _____   Comment:
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7. In what order should a open/fetch/loop set of commands in a PL/SQL block be implemented if you use the %NOTFOUND cursor variable in the exit when statement? Why?
Level: Intermediate

Expected answer: OPEN then LOOP then FETCH followed by the exit when. If not specified in this order will result in the final return being done twice because of the way the %NOTFOUND is handled by PL/SQL.

Score: _____   Comment:
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8. What are SQLCODE and SQLERRM and why are they important for PL/SQL developers?
Level: Intermediate

Expected answer: SQLCODE returns the value of the error number for the last error encountered. The SQLERRM returns the actual error message for the last error encountered. They can be used in exception handling to report, or, store in an error log table, the error that occurred in the code. These are especially useful for the WHEN OTHERS exception.

Score: _____   Comment:
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9. How can you find within a PL/SQL block, if a cursor is open?
Level: Low

Expected answer: Use the %ISOPEN cursor status variable.

Score: _____   Comment:
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10. How can you generate debugging output from PL/SQL?
Level:Intermediate to high

Expected answer: Use the DBMS_OUTPUT package. Another possible method is to just use the SHOW ERROR command, but this only shows errors. The DBMS_OUTPUT package can be

used to show intermediate results from loops and the status of variables as the procedure is executed. The new package UTL_FILE can also be used.

Score: _____   Comment:
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11. What are the types of triggers?
Level:Intermediate to high

Expected Answer: There are 12 types of triggers in PL/SQL that consist of combinations of the BEFORE, AFTER, ROW, TABLE, INSERT, UPDATE, DELETE and ALL key words:

BEFORE ALL ROW INSERT
AFTER ALL ROW INSERT
BEFORE INSERT
AFTER INSERT
etc.
Score: _____   Comment:
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12. What is the INSTEAD OF trigger and when is it used?
Level: Low

Expected Answer: The instead of trigger is the only trigger allowed on views. It is used in ORACLE8 to allow update of join views.

Score: _____   Comment:
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13. What is an incomplete type and when is it used?
Level: Intermediate

Expected Answer: An incomplete type is one where the CREATE TYPE names the type but no attributes. It is used to specify a type in a type hierarchy which will be the circular reference. (Like a BOM or Emp-Manager-Dept type relation).

Score: _____   Comment:
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Section average score: _____   Level: _____

<B>DBA:

1. Give one method for transferring a table from one schema to another:
Level:Intermediate

Expected Answer: There are several possible methods, export-import, CREATE TABLE... AS SELECT, or COPY.

Score: _____   Comment:
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2. What is the purpose of the IMPORT option IGNORE? What is it's default setting?
Level: Low

Expected Answer: The IMPORT IGNORE option tells import to ignore "already exists" errors. If it is not specified the tables that already exist will be skipped. If it is specified, the error is ignored and the tables data will be inserted. The default value is N.

Score: _____   Comment:
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3. You have a rollback segment in a version 7.2 database that has expanded beyond optimal, how can it be restored to optimal?
Level: Low

Expected answer: Use the ALTER TABLESPACE ..... SHRINK command.

Score: _____   Comment:
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4. If the DEFAULT and TEMPORARY tablespace clauses are left out of a CREATE USER command what happens? Is this bad or good? Why?
Level: Low

Expected answer: The user is assigned the SYSTEM tablespace as a default and temporary tablespace. This is bad because it causes user objects and temporary segments to be placed into the SYSTEM tablespace resulting in fragmentation and improper table placement (only data dictionary objects and the system rollback segment should be in SYSTEM).

Score: _____   Comment:
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5. What are some of the Oracle provided packages that DBAs should be aware of?
Level: Intermediate to High

Expected answer: Oracle provides a number of packages in the form of the DBMS_ packages owned by the SYS user. The packages used by DBAs may include: DBMS_SHARED_POOL, DBMS_UTILITY, DBMS_SQL, DBMS_DDL, DBMS_SESSION, DBMS_OUTPUT and DBMS_SNAPSHOT. They may also try to answer with the UTL*.SQL or CAT*.SQL series of SQL procedures. These can be viewed as extra credit but aren't part of the answer.

Score: _____   Comment:
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6. What happens if the constraint name is left out of a constraint clause?
Level: Low

Expected answer: The Oracle system will use the default name of SYS_Cxxxx where xxxx is a system generated number. This is bad since it makes tracking which table the constraint belongs to or what the constraint does harder.

Score: _____   Comment: _____

7. What happens if a tablespace clause is left off of a primary key constraint clause?
Level: Low

Expected answer: This results in the index that is automatically generated being placed in then users default tablespace. Since this will usually be the same tablespace as the table is being created in, this can cause serious performance problems.

Score: _____   Comment: _____

8. What is the proper method for disabling and re-enabling a primary key constraint?
Level: Intermediate

Expected answer: You use the ALTER TABLE command for both. However, for the enable clause you must specify the USING INDEX and TABLESPACE clause for primary keys.

Score: _____   Comment:
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9. What happens if a primary key constraint is disabled and then enabled without fully specifying the index clause?
Level: Intermediate

Expected answer: The index is created in the user's default tablespace and all sizing information is lost. Oracle doesn't store this information as a part of the constraint definition, but only as part of the index definition, when the constraint was disabled the index was dropped and the information is gone.

Score: _____   Comment:
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10. (On UNIX) When should more than one DB writer process be used? How many should be used?
Level: High

Expected answer: If the UNIX system being used is capable of asynchronous IO then only one is required, if the system is not capable of asynchronous IO then up to twice the number of disks used by Oracle number of DB writers should be specified by use of the db_writers initialization parameter.

Score: _____   Comment:
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11. You are using hot backup without being in archivelog mode, can you recover in the event of a failure? Why or why not?

Level: High

Expected answer: You can't use hot backup without being in archivelog mode. So no, you couldn't recover.

Score: _____ Comment:

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12. What causes the "snapshot too old" error? How can this be prevented or mitigated?
Level: Intermediate

Expected answer: This is caused by large or long running transactions that have either wrapped onto their own rollback space or have had another transaction write on part of their rollback space. This can be prevented or mitigated by breaking the transaction into a set of smaller transactions or increasing the size of the rollback segments and their extents.

Score: _____ Comment:

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13. How can you tell if a database object is invalid?
Level: Low

Expected answer: By checking the status column of the DBA_, ALL_ or USER_OBJECTS views, depending upon whether you own or only have permission on the view or are using a DBA account.

Score: _____ Comment:

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14. A user is getting an ORA-00942 error yet you know you have granted them permission on the table, what else should you check?
Level: Low

Expected answer: You need to check that the user has specified the full name of the object (select empid from scott.emp; instead of select empid from emp;) or has a synonym that points to the object (create synonym emp for scott.emp;)

Score: _____ Comment:

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15. A developer is trying to create a view and the database won't let him. He has the "DEVELOPER" role which has the "CREATE VIEW" system privilege and SELECT grants on the tables he is using, what is the problem?
Level: Intermediate

Expected answer: You need to verify the developer has direct grants on all tables used in the view. You can't create a stored object with grants given through views.

Score: _____ Comment:

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16. If you have an example table, what is the best way to get sizing data for the production table implementation?
Level: Intermediate

Expected answer: The best way is to analyze the table and then use the data provided in the DBA_TABLES view to get the average row length and other pertinent data for the calculation. The quick and dirty way is to look at the number of blocks the table is actually using and ratio the number of rows in the table to its number of blocks against the number of expected rows.

Score: _____ Comment:

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17. How can you find out how many users are currently logged into the database? How can you find their operating system id?
Level: high

Expected answer: There are several ways. One is to look at the v$session or v$process views. Another way is to check the current_logins parameter in the v$sysstat view. Another if you are on UNIX is to do a "ps -ef|grep oracle|wc -l' command, but this only works against a single instance installation.

Score: _____ Comment:

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18. A user selects from a sequence and gets back two values, his select is:

SELECT pk_seq.nextval FROM dual;

What is the problem?
Level: Intermediate

Expected answer: Somehow two values have been inserted into the dual table. This table is a single row, single column table that should only have one value in it.

Score: _____ Comment:

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19. How can you determine if an index needs to be dropped and rebuilt?
Level: Intermediate

Expected answer: Run the ANALYZE INDEX command on the index to validate its structure and then calculate the ratio of LF_BLK_LEN/LF_BLK_LEN+BR_BLK_LEN and if it isn't near 1.0 (i.e. greater than 0.7 or so) then the index should be rebuilt. Or if the ratio BR_BLK_LEN/ LF_BLK_LEN+BR_BLK_LEN is nearing 0.3.

Score: _____ Comment:

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20. What can, and can't be placed in a partitioned table?
Level: Intermediate

Expected answer: A partitioned table can only be implemented as a straight relational type table at the current time (8.0.2/8.0.3) it cannot contain VARRAY, Nested Tables or types.

Score: _____   Comment:
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21. What will take less storage for a given set of attributes? A VARRAY or a Nested-Table?
Level: Advanced

Expected answer: VARRAY

Score: _____   Comment:
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22. If you specify that an index on a partioned table is LOCAL what does that mean?
Level: Intermediate

Expected Answer: It means that the index will be partitoned identically to the partitioned table it is built for.

23. If you create a LOCAL index on a partitioned table where will it be built?
Level: Intermediate

Expected Answer: If you don't specify the TABLESPACE clause the partitions for the indexes will be placed in the same locations as those for the table.

Score: _____   Comment:
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24. Can MTS and 3GL callouts be used in the same database?
Level: Advanced

Expected Answer: No

Score: _____   Comment:
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25. In the most basic of environments (no parallel query) if you have 25 processes doing 3GL callouts, how many proceeses will their be (without the base Oracle proceeses)?
Level: Advanced

Expected Answer: At least 50, #GL callouts start up a separate process to handle the 3GL passes for each process that does a 3GL callout. There is also an additional listener process which must be started.

Score: _____   Comment:
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26. If you are using advanced queuing in version 8.0.3 how many queue processes can you start?
Level: Advanced

Expected Answer: Only 1 in version 8.0.3, in future releases more are promised.

Score: _____   Comment:

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27. How many types of table are there in Oracle8?
Level: Intermediate

Expected Answer: Releational, Typed, Nested, Index Only, Combination, Object.

Score: _____   Comment:

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28. How can I determine if an column in a table is a good candidate for a bitmapped index?
Level: Advanced

Expected Answer: If it has low cardinality, for example if the average row count per distinct column value is greater than 100 it would probably be a good bitmapped index column.

Score: _____   Comment:

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Section average score: _____ Level: _____

<B>SQL/ SQLPlus

1. How can variables be passed to a SQL routine?
Level: Low

Expected answer: By use of the & symbol. For passing in variables the numbers 1-8 can be used (&1, &2,...,&8) to pass the values after the command into the SQLPLUS session. To be prompted for a specific variable, place the ampersanded variable in the code itself:
 "select * from dba_tables where owner=&owner_name;" . Use of double ampersands tells SQLPLUS to resubstitute the value for each subsequent use of the variable, a single ampersand will cause a reprompt for the value unless an ACCEPT statement is used to get the value from the user.

Score: _____   Comment:
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2. You want to include a carriage return/linefeed in your output from a SQL script, how can you do this?
Level: Intermediate to high

Expected answer: The best method is to use the CHR() function (CHR(10) is a return/linefeed) and the concatenation function "||". Another method, although it is hard to document and isn't always portable is to use the return/linefeed as a part of a quoted string.

Score: _____   Comment:
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3. How can you call a PL/SQL procedure from SQL?
Level: Intermediate

Expected answer: By use of the EXECUTE (short form EXEC) command.

Score: _____   Comment:
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4. How do you execute a host operating system command from within SQL?
Level: Low

Expected answer: By use of the exclamation point "!" (in UNIX and some other OS) or the HOST (HO) command.

Score: _____   Comment:
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5. You want to use SQL to build SQL, what is this called and give an example
Level: Intermediate to high

Expected answer: This is called dynamic SQL. An example would be:

set lines 90 pages 0 termout off feedback off verify off
spool drop_all.sql
select 'drop user '||username||' cascade;' from dba_users
where username not in ("SYS','SYSTEM');
spool off

Essentially you are looking to see that they know to include a command (in this case DROP USER...CASCADE;) and that you need to concatenate using the '||' the values selected from the database.

Score: _____ Comment:
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6. What SQLPlus command is used to format output from a select?
Level: low

Expected answer: This is best done with the COLUMN command.

Score: _____ Comment:
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7. You want to group the following set of select returns, what can you group on?

Max(sum_of_cost), min(sum_of_cost), count(item_no), item_no
Level: Intermediate

Expected answer: The only column that can be grouped on is the "item_no" column, the rest have aggregate functions associated with them.

Score: _____ Comment:
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8. What special Oracle feature allows you to specify how the cost based system treats a SQL statement?
Level: Intermediate to high

Expected answer: The COST based system allows the use of HINTs to control the optimizer path selection. If they can give some example hints such as FIRST ROWS, ALL ROWS, USING INDEX, STAR, even better.

Score: _____ Comment:
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9. You want to determine the location of identical rows in a table before attempting to place a unique index on the table, how can this be done?
Level: High

Expected answer: Oracle tables always have one guaranteed unique column, the rowid column. If you use a min/max function against your rowid and then select against the proposed primary key you can squeeze out the rowids of the duplicate rows pretty quick. For example:

```
select rowid from emp e
        where e.rowid > (select min(x.rowid)
        from emp x
        where x.emp_no = e.emp_no);
```

In the situation where multiple columns make up the proposed key, they must all be used in the where clause.

Score: _____   Comment:

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10. What is a Cartesian product?
Level: Low

Expected answer: A Cartesian product is the result of an unrestricted join of two or more tables. The result set of a three table Cartesian product will have x * y * z number of rows where x, y, z correspond to the number of rows in each table involved in the join.

Score: _____   Comment:

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11. You are joining a local and a remote table, the network manager complains about the traffic involved, how can you reduce the network traffic?
Level: High

Expected answer: Push the processing of the remote data to the remote instance by using a view to pre-select the information for the join. This will result in only the data required for the join being sent across.

Score: _____   Comment:

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12. What is the default ordering of an ORDER BY clause in a SELECT statement?
Level: Low

Expected answer: Ascending

Score: _____   Comment:

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13. What is tkprof and how is it used?
Level: Intermediate to high

Expected answer: The tkprof tool is a tuning tool used to determine cpu and execution times for SQL statements. You use it by first setting timed_statistics to true in the initialization file and then turning on tracing for either the entire database via the sql_trace parameter or for the session using the ALTER SESSION command. Once the trace file is generated you run the tkprof tool against the trace file and then look at the output from the tkprof tool. This can also be used to generate explain plan output.

Score: _____   Comment:

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14. What is explain plan and how is it used?
Level: Intermediate to high

Expected answer: The EXPLAIN PLAN command is a tool to tune SQL statements. To use it you must have an explain_table generated in the user you are running the explain plan for. This is created using the utlxplan.sql script. Once the explain plan table exists you run the explain plan command giving as its argument the SQL statement to be explained. The explain_plan table is then queried to see the execution plan of the statement. Explain plans can also be run using tkprof.

Score: _____   Comment:

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15. How do you set the number of lines on a page of output? The width?
Level: Low

Expected answer: The SET command in SQLPLUS is used to control the number of lines generated per page and the width of those lines, for example SET PAGESIZE 60 LINESIZE 80 will generate reports that are 60 lines long with a line width of 80 characters. The PAGESIZE and LINESIZE options can be shortened to PAGES and LINES.

Score: _____   Comment:

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16. How do you prevent output from coming to the screen?
Level: Low

Expected answer: The SET option TERMOUT controls output to the screen. Setting TERMOUT OFF turns off screen output. This option can be shortened to TERM.

Score: _____   Comment:

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17. How do you prevent Oracle from giving you informational messages during and after a SQL statement execution?
Level: Low

Expected answer: The SET options FEEDBACK and VERIFY can be set to OFF.

Score: _____   Comment:

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18. How do you generate file output from SQL?
Level: Low

Expected answer: By use of the SPOOL command

Score: _____   Comment:

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Section average score: _____   Level: _____

<B>Tuning Questions:

1. A tablespace has a table with 30 extents in it. Is this bad? Why or why not.
Level: Intermediate

Expected answer: Multiple extents in and of themselves aren't bad. However if you also have chained rows this can hurt performance.

Score: _____   Comment:
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2. How do you set up tablespaces during an Oracle installation?
Level: Low

Expected answer: You should always attempt to use the Oracle Flexible Architecture standard or another partitioning scheme to ensure proper separation of SYSTEM, ROLLBACK, REDO LOG, DATA, TEMPORARY and INDEX segments.

Score: _____   Comment:
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3. You see multiple fragments in the SYSTEM tablespace, what should you check first?
Level: Low

Expected answer: Ensure that users don't have the SYSTEM tablespace as their TEMPORARY or DEFAULT tablespace assignment by checking the DBA_USERS view.

Score: _____   Comment:
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4. What are some indications that you need to increase the SHARED_POOL_SIZE parameter?
Level: Intermediate

Expected answer: Poor data dictionary or library cache hit ratios, getting error ORA-04031. Another indication is steadily decreasing performance with all other tuning parameters the same.

Score: _____   Comment:
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5. What is the general guideline for sizing db_block_size and db_multi_block_read for an application that does many full table scans?
Level: High

Expected answer: Oracle almost always reads in 64k chunks. The two should have a product equal to 64 or a multiple of 64.

Score: _____   Comment:
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6. What is the fastest query method for a table?
Level: Intermediate

Expected answer: Fetch by rowid

Score: _____   Comment:

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7. Explain the use of TKPROF? What initialization parameter should be turned on to get full TKPROF output?
Level: High

Expected answer: The tkprof tool is a tuning tool used to determine cpu and execution times for SQL statements. You use it by first setting timed_statistics to true in the initialization file and then turning on tracing for either the entire database via the sql_trace parameter or for the session using the ALTER SESSION command. Once the trace file is generated you run the tkprof tool against the trace file and then look at the output from the tkprof tool. This can also be used to generate explain plan output.

Score: _____   Comment:

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8. When looking at v$sysstat you see that sorts (disk) is high. Is this bad or good? If bad -How do you correct it?
Level: Intermediate

Expected answer: If you get excessive disk sorts this is bad. This indicates you need to tune the sort area parameters in the initialization files. The major sort are parameter is the SORT_AREA_SIZe parameter.

Score: _____   Comment:

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9. When should you increase copy latches? What parameters control copy latches?
Level: high

Expected answer: When you get excessive contention for the copy latches as shown by the "redo copy" latch hit ratio. You can increase copy latches via the initialization parameter LOG_SIMULTANEOUS_COPIES to twice the number of CPUs on your system.

Score: _____   Comment:

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10. Where can you get a list of all initialization parameters for your instance? How about an indication if they are default settings or have been changed?
Level: Low

Expected answer: You can look in the init<sid>.ora file for an indication of manually set parameters. For all parameters, their value and whether or not the current value is the default value, look in the v$parameter view.

Score: _____   Comment:

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11. Describe hit ratio as it pertains to the database buffers. What is the difference between instantaneous and cumulative hit ratio and which should be used for tuning?
Level: Intermediate

Expected answer: The hit ratio is a measure of how many times the database was able to read a value from the buffers verses how many times it had to re-read a data value from the disks. A value greater than 80-90% is good, less could indicate problems. If you simply take the ratio of existing parameters this will be a cumulative value since the database started. If you do a comparison between pairs of readings based on some arbitrary time span, this is the instantaneous ratio for that time span. Generally speaking an instantaneous reading gives more valuable data since it will tell you what your instance is doing for the time it was generated over.

Score: _____   Comment:
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12. Discuss row chaining, how does it happen? How can you reduce it? How do you correct it?
Level: high

Expected answer: Row chaining occurs when a VARCHAR2 value is updated and the length of the new value is longer than the old value and won't fit in the remaining block space. This results in the row chaining to another block. It can be reduced by setting the storage parameters on the table to appropriate values. It can be corrected by export and import of the effected table.

Score: _____   Comment:
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13. When looking at the estat events report you see that you are getting busy buffer waits. Is this bad? How can you find what is causing it?
Level: high

Expected answer: Buffer busy waits could indicate contention in redo, rollback or data blocks. You need to check the v$waitstat view to see what areas are causing the problem. The value of the "count" column tells where the problem is, the "class" column tells you with what. UNDO is rollback segments, DATA is data base buffers.

Score: _____   Comment:
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14. If you see contention for library caches how can you fix it?
Level: Intermediate

Expected answer: Increase the size of the shared pool.

Score: _____   Comment:
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15. If you see statistics that deal with "undo" what are they really talking about?
Level: Intermediate

Expected answer: Rollback segments and associated structures.

Score: _____   Comment:
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16. If a tablespace has a default pctincrease of zero what will this cause (in relationship to the smon process)?
Level: High

Expected answer: The SMON process won't automatically coalesce its free space fragments.

Score: _____   Comment:
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17. If a tablespace shows excessive fragmentation what are some methods to defragment the tablespace? (7.1,7.2 and 7.3 only)
Level: High

Expected answer: In Oracle 7.0 to 7.2 The use of the 'alter session set events 'immediate trace name coalesce level ts#';' command is the easiest way to defragment contiguous free space fragmentation. The ts# parameter corresponds to the ts# value found in the ts$ SYS table. In version 7.3 the 'alter tablespace <name> coalesce;' is best. If the free space isn't contiguous then export, drop and import of the tablespace contents may be the only way to reclaim non-contiguous free space.

Score: _____   Comment:
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18. How can you tell if a tablespace has excessive fragmentation?
Level: Intermediate

If a select against the dba_free_space table shows that the count of a tablespaces extents is greater than the count of its data files, then it is fragmented.

Score: _____   Comment:
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19. You see the following on a status report:

redo log space requests   23
redo log space wait time   0

Is this something to worry about? What if redo log space wait time is high? How can you fix this?
Level: Intermediate

Expected answer: Since the wait time is zero, no. If the wait time was high it might indicate a need for more or larger redo logs.

Score: _____   Comment:
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20. What can cause a high value for recursive calls? How can this be fixed?
Level: High

Expected answer: A high value for recursive calls is cause by improper cursor usage, excessive dynamic space management actions, and or excessive statement re-parses. You need to determine the cause and correct it By either relinking applications to hold cursors, use proper space management techniques (proper storage and sizing) or ensure repeat queries are placed in packages for proper reuse.

Score: _____   Comment:
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21. If you see a pin hit ratio of less than 0.8 in the estat library cache report is this a problem? If so, how do you fix it?
Level: Intermediate

Expected answer: This indicate that the shared pool may be too small. Increase the shared pool size.

Score: _____   Comment:
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22. If you see the value for reloads is high in the estat library cache report is this a matter for concern?
Level: Intermediate

Expected answer: Yes, you should strive for zero reloads if possible. If you see excessive reloads then increase the size of the shared pool.

Score: _____   Comment:
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23. You look at the dba_rollback_segs view and see that there is a large number of shrinks and they are of relatively small size, is this a problem? How can it be fixed if it is a problem?
Level: High

Expected answer: A large number of small shrinks indicates a need to increase the size of the rollback segment extents. Ideally you should have no shrinks or a small number of large shrinks. To fix this just increase the size of the extents and adjust optimal accordingly.

Score: _____   Comment:
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24. You look at the dba_rollback_segs view and see that you have a large number of wraps is this a problem?
Level: High

Expected answer: A large number of wraps indicates that your extent size for your rollback segments are probably too small. Increase the size of your extents to reduce the number of wraps. You can look at the average transaction size in the same view to get the information on transaction size.

Score: _____   Comment:
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25. In a system with an average of 40 concurrent users you get the following from a query on rollback extents:

```
ROLLBACK    CUR EXTENTS
----------    -----------
R01             11
R02              8
R03             12
R04              9
SYSTEM           4
```

You have room for each to grow by 20 more extents each. Is there a problem? Should you take any action?
Level: Intermediate

Expected answer: No there is not a problem. You have 40 extents showing and an average of 40 concurrent users. Since there is plenty of room to grow no action is needed.

Score: _____   Comment:
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26. You see multiple extents in the temporary tablespace. Is this a problem?
Level: Intermediate

Expected answer: As long as they are all the same size this isn't a problem. In fact, it can even improve performance since Oracle won't have to create a new extent when a user needs one.

Score: _____   Comment:
_____

27. What is the large pool and how do you use it in Oracle8?
Level: Intermediate

Expected Answer: The large pool is a new subsection of the shared pool that is used to absorb the memory requirements of MTS use so that they don't effect the shared pool allocation of memory. It is used by specifying a size in the LARGE_POOL_SIZE initialization parameter and a minimum allocation per user in the LARGE_POOL_MIN_ALLOC initialization parameter.

Score: _____   Comment: _____

28. You find that an index has a large percentage of leaf blocks empty due to update and delete activity. Is this bad, and, if so, how can it be fixed?
Level: Advanced

Expected Answer: This can cause perfromance problems so this is bad. It can be fixed in early Oracle7 releases by dropping and rebuilding the index. In later Oracle7 (7.3) and Oracle8 you can rebuild the index in place.

Score: _____   Comment:
_____

29. What is an Oracle Instance?
Level: beginning

Expected Answer: An Oracle instance is a combination of the processes and files that make up an Oracle database, usually the smon, pmon, dbwr, arch, lgwr, ckp processes as a minimum and the underlying file structures.

Section average score: _____ Level: _____

<B>Installation/Configuration

1. Define OFA.
Level: Low

Expected answer: OFA stands for Optimal Flexible Architecture. It is a method of placing directories and files in an Oracle system so that you get the maximum flexibility for future tuning and file placement.

Score: _____   Comment:
_____

2. How do you set up your tablespace on installation?
Level: Low

Expected answer: The answer here should show an understanding of separation of redo and rollback, data and indexes and isolation os SYSTEM tables from other tables. An example would be to specify that at least 7 disks should be used for an Oracle installation so that you can place SYSTEM tablespace on one, redo logs on two (mirrored redo logs) the TEMPORARY tablespace on another, ROLLBACK tablespace on another and still have two for DATA and INDEXES. They should indicate how they will handle archive logs and exports as well. As long as they have a logical plan for combining or further separation more or less disks can be specified.

Score: _____   Comment:
_____

3. What should be done prior to installing Oracle (for the OS and the disks)?
Level: Low

Expected Answer: adjust kernel parameters or OS tuning parameters in accordance with installation guide. Be sure enough contiguous disk space is available.

Score: _____   Comment:
_____

4. You have installed Oracle and you are now setting up the actual instance. You have been waiting an hour for the initialization script to finish, what should you check first to determine if there is a problem?
Level: Intermediate to high

Expected Answer: Check to make sure that the archiver isn't stuck. If archive logging is turned on during install a large number of logs will be created. This can fill up your archive log destination causing Oracle to stop to wait for more space.

Score: _____   Comment:
_____

5. When configuring SQLNET on the server what files must be set up?
Level: Intermediate

Expected answer: INITIALIZATION file, TNSNAMES.ORA file, SQLNET.ORA file

Score: _____ Comment:

_____

6. When configuring SQLNET on the client what files need to be set up?
Level: Intermediate

Expected answer: SQLNET.ORA, TNSNAMES.ORA

Score: _____ Comment:

_____

7. What must be installed with ODBC on the client in order for it to work with Oracle?
Level: Intermediate

Expected answer: SQLNET and PROTOCOL (for example: TCPIP adapter) layers of the transport programs.

Score: _____ Comment:

_____

8. You have just started a new instance with a large SGA on a busy existing server. Performance is terrible, what should you check for?
Level: Intermediate

Expected answer: The first thing to check with a large SGA is that it isn't being swapped out.

Score: _____ Comment:

_____

9. What OS user should be used for the first part of an Oracle installation (on UNIX)?
Level: low

Expected answer: You must use root first.

Score: _____ Comment:

_____

10. When should the default values for Oracle initialization parameters be used as is?
Level: Low

Expected answer: Never

Score: _____ Comment:

_____

11. How many control files should you have? Where should they be located?
Level: Low

Expected answer: At least 2 on separate disk spindles. Be sure they say on separate disks, not just file systems.

Score: _____ Comment:

_____

12. How many redo logs should you have and how should they be configured for maximum recoverability?
Level: Intermediate

Expected answer: You should have at least three groups of two redo logs with the two logs each on a separate disk spindle (mirrored by Oracle). The redo logs should not be on raw devices on UNIX if it can be avoided.

Score: _____   Comment:
_____

13. You have a simple application with no "hot" tables (i.e. uniform IO and access requirements). How many disks should you have assuming standard layout for SYSTEM, USER, TEMP and ROLLBACK tablespaces?

Expected answer: At least 7, see disk configuration answer above.

Score: _____   Comment:
_____

14. On UNIX, when must you use RAW devices?
Level: Advanced

Expected Answer: Only if you use parallel (shared) server.

Score: _____   Comment:
_____

15. You are using 4 -- SQLLOADER sessions to load a 200 megabyte table, how should the table be configured as far as extents and why?
Level: Advanced

Expected Answer: Each session will load above the high water mark for the table, so each will grab a new extent, size each for one quarter of the expected size (50 meg each).

Score: _____   Comment:
_____

Section average score: _____   Level: _____

<B>Data Modeler:

1. Describe third normal form?
Level: Low

Expected answer: Something like: In third normal form all attributes in an entity are related to the primary key and only to the primary key

Score: _____ Comment:
_____

2. Is the following statement true or false:

"All relational databases must be in third normal form"

Why or why not?
Level: Intermediate

Expected answer: False. While 3NF is good for logical design most databases, if they have more than just a few tables, will not perform well using full 3NF. Usually some entities will be denormalized in the logical to physical transfer process.

Score: _____ Comment:
_____

3. What is an ERD?
Level: Low

Expected answer: An ERD is an Entity-Relationship-Diagram. It is used to show the entities and relationships for a database logical model.

Score: _____ Comment:
_____

4. Why are recursive relationships bad? How do you resolve them?
Level: Intermediate

A recursive relationship (one where a table relates to itself) is bad when it is a hard relationship (i.e. neither side is a "may" both are "must") as this can result in it not being possible to put in a top or perhaps a bottom of the table (for example in the EMPLOYEE table you couldn't put in the PRESIDENT of the company because he has no boss, or the junior janitor because he has no subordinates). These type of relationships are usually resolved by adding a small intersection entity.

Score: _____ Comment:
_____

5. What does a hard one-to-one relationship mean (one where the relationship on both ends is "must")?
Level: Low to intermediate

Expected answer: This means the two entities should probably be made into one entity.

Score: _____ Comment:

_____

6. How should a many-to-many relationship be handled?
Level: Intermediate

Expected answer: By adding an intersection entity table

Score: _____ Comment:

_____

7. What is an artificial (derived) primary key? When should an artificial (or derived) primary key be used?
Level: Intermediate

Expected answer: A derived key comes from a sequence. Usually it is used when a concatenated key becomes too cumbersome to use as a foreign key.

Score: _____ Comment:

_____

8. When should you consider denormalization?
Level: Intermediate

Expected answer: Whenever performance analysis indicates it would be beneficial to do so without compromising data integrity.

Score: _____ Comment:

_____

Section average score: _____ Level: _____

<B>UNIX:

1. How can you determine the space left in a file system?
Level: Low

Expected answer: There are several commands to do this: du, df, or bdf

Score: _____   Comment:
_____

2. How can you determine the number of SQLNET users logged in to the UNIX system?
Level: Intermediate

Expected answer: SQLNET users will show up with a process unique name that begins with oracle<SID>, if you do a ps -ef|grep oracle<SID>|wc -l you can get a count of the number of users.

Score: _____   Comment:
_____

3. What command is used to type files to the screen?
Level: Low

Expected answer: cat, more, pg

Score: _____   Comment:
_____

4. What command is used to remove a file?
Level: Low

Expected answer: rm

Score: _____   Comment:
_____

5. Can you remove an open file under UNIX?
Level: Low

Expected answer: yes

Score: _____   Comment:
_____

6. How do you create a decision tree in a shell script?
Level: intermediate

Expected answer: depending on shell, usually a case-esac or an if-endif or fi structure

Score: _____   Comment:
_____

7. What is the purpose of the grep command?

Level: Low

Expected answer: grep is a string search command that parses the specified string from the specified file or files

Score: _____   Comment:

_____

8. The system has a program that always includes the word nocomp in its name, how can you determine the number of processes that are using this program?
Level: intermediate

Expected answer: ps -ef|grep *nocomp*|wc -l

Score: _____   Comment:

_____

9. What is an inode?
Level: Intermediate

Expected answer: an inode is a file status indicator. It is stored in both disk and memory and tracts file status. There is one inode for each file on the system.

Score: _____   Comment:

_____

10. The system administrator tells you that the system hasn't been rebooted in 6 months, should he be proud of this?
Level: High

Expected answer: Maybe. Some UNIX systems don't clean up well after themselves. Inode problems and dead user processes can accumulate causing possible performance and corruption problems. Most UNIX systems should have a scheduled periodic reboot so file systems can be checked and cleaned and dead or zombie processes cleared out.

Score: _____   Comment:

_____

11. What is redirection and how is it used?
Level: Intermediate

Expected answer: redirection is the process by which input or output to or from a process is redirected to another process. This can be done using the pipe symbol "|", the greater than symbol ">" or the "tee" command. This is one of the strengths of UNIX allowing the output from one command to be redirected directly into the input of another command.

Score: _____   Comment:

_____

12. How can you find dead processes?
Level: Intermediate

Expected answer: ps -ef|grep zombie -- or -- who -d depending on the system.

Score: _____   Comment:

_____

13. How can you find all the processes on your system?
Level: Low

Expected answer: Use the ps command

Score: _____   Comment:

_____

14. How can you find your id on a system?
Level: Low

Expected answer: Use the "who am i" command.

Score: _____   Comment:

_____

15. What is the finger command?
Level: Low

Expected answer: The finger command uses data in the passwd file to give information on system
         users.

Score: _____   Comment:

_____

16. What is the easiest method to create a file on UNIX?
Level: Low

Expected answer: Use the touch command

Score: _____   Comment:

_____

17. What does >> do?
Level: Intermediate

Expected answer: The ">>" redirection symbol appends the output from the command specified
into the file specified. The file must already have been created.

Score: _____   Comment:

_____

18. If you aren't sure what command does a particular UNIX function what is the best way to
determine the command?

Expected answer: The UNIX man -k <value> command will search the man pages for the value
specified. Review the results from the command to find the command of interest.

Score: _____   Comment:

_____

Section average score: _____ Level: _____

<B>Oracle Troubleshooting:

1. How can you determine if an Oracle instance is up from the operating system level?
Level: Low

Expected answer: There are several base Oracle processes that will be running on multi-user operating systems, these will be smon, pmon, dbwr and lgwr. Any answer that has them using their operating system process showing feature to check for these is acceptable. For example, on UNIX a ps -ef|grep dbwr will show what instances are up.

Score: _____   Comment:
_____

2. Users from the PC clients are getting messages indicating :
Level: Low

ORA-06114: (Cnct err, can't get err txt. See Servr Msgs & Codes Manual)

What could the problem be?

Expected answer: The instance name is probably incorrect in their connection string.

Score: _____   Comment:
_____

3. Users from the PC clients are getting the following error stack:
Level: Low

ERROR: ORA-01034: ORACLE not available
ORA-07318: smsget: open error when opening sgadef.dbf file.
HP-UX Error: 2: No such file or directory

What is the probable cause?

Expected answer: The Oracle instance is shutdown that they are trying to access, restart the instance.

Score: _____   Comment:
_____

4. How can you determine if the SQLNET process is running for SQLNET V1? How about V2?
Level: Low

Expected answer: For SQLNET V1 check for the existence of the orasrv process. You can use the command "tcpctl status" to get a full status of the V1 TCPIP server, other protocols have similar command formats. For SQLNET V2 check for the presence of the LISTENER process(s) or you can issue the command "lsnrctl status".

Score: _____   Comment:
_____

5. What file will give you Oracle instance status information? Where is it located?
Level: Low

Expected answer: The alert<SID>.ora log. It is located in the directory specified by the background_dump_dest parameter in the v$parameter table.

6. Users aren't being allowed on the system. The following message is received:
Level: Intermediate

ORA-00257   archiver is stuck. Connect internal only, until freed

What is the problem?

Expected answer: The archive destination is probably full, backup the archive logs and remove them and the archiver will re-start.

Score: _____   Comment:
_____

7. Where would you look to find out if a redo log was corrupted assuming you are using Oracle mirrored redo logs?
Level: Intermediate

Expected answer: There is no message that comes to the SQLDBA or SRVMGR programs during startup in this situation, you must check the alert<SID>.log file for this information.

Score: _____   Comment:
_____

8. You attempt to add a datafile and get:
Level: Intermediate

ORA-01118: cannot add anymore datafiles: limit of 40 exceeded

What is the problem and how can you fix it?

Expected answer: When the database was created the db_files parameter in the initialization file was set to 40. You can shutdown and reset this to a higher value, up to the value of MAX_DATAFILES as specified at database creation. If the MAX_DATAFILES is set to low, you will have to rebuild the control file to increase it before proceeding.

Score: _____   Comment:
_____

9. You look at your fragmentation report and see that smon hasn't coalesced any of you tablespaces, even though you know several have large chunks of contiguous free extents. What is the problem?
Level: High

Expected answer: Check the dba_tablespaces view for the value of pct_increase for the tablespaces. If pct_increase is zero, smon will not coalesce their free space.

Score: _____   Comment:
_____

10. Your users get the following error:
Level: Intermediate

ORA-00055   maximum number of DML locks exceeded

What is the problem and how do you fix it?

Expected answer: The number of DML Locks is set by the initialization parameter DML_LOCKS. If this value is set to low (which it is by default) you will get this error. Increase the value of DML_LOCKS. If you are sure that this is just a temporary problem, you can have them wait and then try again later and the error should clear.

Score: _____   Comment: _____

11. You get a call from you backup DBA while you are on vacation. He has corrupted all of the control files while playing with the ALTER DATABASE BACKUP CONTROLFILE command. What do you do?
Level: High

Expected answer: As long as all datafiles are safe and he was successful with the BACKUP controlfile command you can do the following:

CONNECT INTERNAL
STARTUP MOUNT
(Take any read-only tablespaces offline before next step ALTER DATABASE DATAFILE ....
OFFLINE;)
RECOVER DATABASE USING BACKUP CONTROLFILE
ALTER DATABASE OPEN RESETLOGS;
(bring read-only tablespaces back online)

Shutdown and backup the system, then restart

If they have a recent output file from the ALTER DATABASE BACKUP CONTROL FILE TO TRACE; command, they can use that to recover as well.

If no backup of the control file is available then the following will be required:

CONNECT INTERNAL
STARTUP NOMOUNT
CREATE CONTROL FILE .....;

However, they will need to know all of the datafiles, logfiles, and settings for MAXLOGFILES, MAXLOGMEMBERS, MAXLOGHISTORY, MAXDATAFILES for the database to use the command.

Score: _____   Comment: _____

Section average score: _____   Level: _____

Oracle Candidate Interview Results

Interview average score: _____   Level: _____

Comments: