OPEN COMPETITION EUR/B/136

ADMINISTRATIVE ASSISTANTS (B5/B4)

Test (d)

01 - Development of computer applications

Case study relating to field 01, designed to test the candidate's specialist knowledge, comprehension and drafting skills, and ability to analyse and summarise.

You must answer two of the first six questions, marked out of 20 points each, and four of the remaining questions, marked out of 5 points each.

Time allowed: 3 hours

> **Do not turn the page until you are told to do so!**

Question 1 (20 points)

You are responsible for developing a subsystem of a workflow application which handles translation management. The input to your subsystem consists of texts for translation (with some attached descriptive data including the target languages) and the output consists of the translated texts (in several languages). Your application must allow for the allocation of work to individual translators, transfer of work between translators and to revisers (revisers are senior translators who correct translations), and return of work to the main application. It must be capable of showing the current workload of each translator (to aid work allocation). Define a set of database tables that might be used to support such a subsystem, their primary keys and the relationships between the tables, and the various actions (in terms of SQL) necessary to accomplish the task. Your answer should not exceed three pages.

Question 2 (20 points)

You are responsible for the quality testing of the API of a new (database) application. Describe in detail the various steps required to ensure a useable product.

Question 3 (20 points)

The following six listings were obtained from an Oracle 7.3 session in a UNIX SVR4 environment. What conclusions can you draw? Explain what the listings are, what is happening, what is missing, what is wrong, what could cause problems, what can be improved, etc.

Listing A:

```
$ cat initIRON1.ora

   ifile  = /oracle/app/oracle/admin/IRON1/pfile/configIRON1.ora
optimizer_mode = choose
db_files = 30
db_name  = IRON
#sort_area_size = 131072
sort_area_size=150000

db_file_multiblock_read_count = 32
db_block_buffers = 25000
 shared_pool_size = 200000000
open_cursors=100
nls_numeric_characters="., "
checkpoint_process = true
processes = 50
dml_locks = 500
   log_buffer = 163840
   sequence_cache_entries = 100
sequence_cache_hash_buckets = 89

blank_trimming = true
# audit_trail = true
   timed_statistics = true
max_dump_file_size = 10240

# log_archive_start = true

compatible = 7.3.4.0
global_names = TRUE
log_checkpoint_interval = 1000
```

```
job_queue_processes=1
resource_limit=false
max_enabled_roles=99

mts_dispatchers="tcp, 5"
mts_max_dispatchers=10
mts_servers=5
mts_max_servers=10
mts_service=IRON1
mts_listener_address="(ADDRESS=(PROTOCOL=tcp)(HOST=IRON)(PORT=1521))"
```

Listing B:

```
$ cat configIRON1.ora

control_files              = (/dls2/ctrlIRON1.ctl)
background_dump_dest       = /oracle/app/oracle/admin/IRON1/bdump
core_dump_dest             = /oracle/app/oracle/admin/IRON1/cdump
user_dump_dest             = /oracle/app/oracle/admin/IRON1/udump

#log_archive_dest          = /oracle/app/oracle/admin/IRON1/arch/arch.log
#db_block_size             = <blocksize>
```

Listing C:

```
SQL> alter rollback segment rbs_rbs1 offline;
SQL> drop rollback segment rbs_rbs1;
SQL> create rollback segment rbs_rbs1
     tablespace rbs
     storage(initial 250K next 500K minextents 1 maxextents 121)
SQL> exit
```

Listing D:

```
$ ps -aef |grep ora
   oracle  4552     1  0    Nov 04 ?          0:00 ora_lgwr_IRON
   oracle  4562     1  0    Nov 04 ?          4:17 ora_s000_IRON
   oracle  4554     1  0    Nov 04 ?          0:00 ora_ckpt_IRON
   oracle  4568     1  0    Nov 04 ?          0:00 ora_s003_IRON
   oracle  4550     1  0    Nov 04 ?          1:29 ora_dbwr_IRON
   oracle  4566     1  0    Nov 04 ?          0:00 ora_s002_IRON
   oracle  4564     1  0    Nov 04 ?          0:00 ora_s001_IRON
   oracle  4570     1  0    Nov 04 ?          0:00 ora_s004_IRON
   oracle  4560     1  0    Nov 04 ?          0:01 ora_snp0_IRON
   oracle  4572     1  0    Nov 04 ?          5:21 ora_d000_IRON
   oracle  4574     1  0    Nov 04 ?          0:00 ora_d001_IRON
   oracle  4576     1  0    Nov 04 ?          0:01 ora_d002_IRON
   oracle  4578     1  0    Nov 04 ?          0:01 ora_d003_IRON
   oracle  4580     1  0    Nov 04 ?          0:00 ora_d004_IRON
   oracle  4558     1  0    Nov 04 ?          0:00 ora_reco_IRON
   oracle 16594     1  0    Sep 22 ?          0:00 oracleIRON (LOCAL=NO)
   oracle  4548     1  0    Nov 04 ?          0:00 ora_pmon_IRON
   oracle  4302     1  0    Nov 04 ?          0:18
/oracle/app/oracle/product/7.3.4/bin/tnslsnr LISTENER -inherit
```

Listing E:

```
$cat crea_emp.sql

   create table
      employee
         (code_key    varchar2(8)   constraint code_key not null primary key,
          salary      number(16,2),
          degree      varchar2(30),
          soc_sec_no  number(15),
          phone_no    number(15),
          name        char(60),
          address1    varchar2(50),
          address2    varchar2(50),
          birth_place varchar2(5)   constraint birth_place references
                                    places.code on delete cascade
          comments    long)
      tablespace ts_users
      pctfree 20
      pctused 80
      storage(initial 500K next 1M minextents 2 maxextents 20)
      cache
      ;
```

Listing F:

```
$ sar -d 1 5

iron iron 4.0 3.0 3446     11/27/98
```

12:52:28	device	%busy	avque	r+w/s	blks/s	avwait	avserv
12:52:29	/dev/rdsk/c100t2d0s0	63	2.4	702	11293	1.3	0.9
12:52:30	/dev/rdsk/c100t0d0s0	1	1.0	1	8	0.0	10.0
	/dev/rdsk/c100t2d0s0	62	2.3	714	11400	1.2	0.9
12:52:31	/dev/rdsk/c100t2d0s0	3	3.3	23	376	3.0	1.3
	/dev/rdsk/c100t4d0s0	65	2.4	492	9000	1.8	1.3
12:52:32	/dev/rdsk/c100t0d0s0	1	1.0	1	0	0.0	10.0
	/dev/rdsk/c100t4d0s0	65	1.9	330	8416	1.7	2.0
12:52:33	/dev/rdsk/c100t4d0s0	83	2.0	350	8912	2.4	2.4
Average	/dev/rdsk/c100t0d0s0	0	1.000	0	2	0.0	10.0
	/dev/rdsk/c100t2d0s0	21	2.391	235	3754	1.2	0.9
	/dev/rdsk/c100t4d0s0	48	2.089	265	5943	2.0	1.8

```
$
```

Question 4 (20 points)

A new database application is being developed. You are responsible for the security aspects of the project. Describe the various procedures you would use to ensure confidentiality of the data, and the measures you would take to avoid loss of data.

Question 5 (20 points)

A program is required to process a data set (the result of a SELECT statement, for example) containing target language, document type and number of pages translated for a large number of translation tasks, in order to provide a printed table of document type versus target language, giving the total number of pages translated for each combination. Either write such a program in a suitable programming language, ensuring that your program is well commented, or describe the program's data structures, give a flow chart of the program's operation, and suggest a suitable programming language.

Question 6

See next page.

Question 6 (20 points)

Explain what the following PERL program does.

One line is missing for this program to work properly. Write down the missing line and explain its purpose and where in the program it should be inserted.

```perl
#!/usr/bin/perl -sw

my $startdir=$ARGV[0];

$ROOTDIR='/www/root/';

undef $/;

$ndir=$nfil=$nhtm=$neln=$nrln=$naln=$nerr=0;

sub chkfil {
    my ($fil)=@_;
    my $dir;
    $nhtm++;
    if (!open(FIL,$fil))  { print "$fil : open failed\n"; }
    else {
        $_=<FIL>; close(FIL);
        foreach (/(?:href|src|map)\s*=\s*['"]([^'"\?\#]*)/ig) {
            $neln++,next if /\/\//;
            if (/^[^\/]/) { $nrln++; ($dir)=$fil=~/(.*\/)/; }
            else          { $naln++; $dir=$ROOTDIR;          }
            if (! -r $dir.$_) { $nerr++; print "$fil : bad link ($_)\n"; }
} } }

sub chkdir {
    my ($dir)=@_;
    $ndir++;
    opendir(DIR,$dir) || die ("opendir $dir failed\n");
    while (defined($fil=readdir(DIR))) {
        next if $fil=~/^\./;
        $nfil++;
        $fil=$dir.'/'.$fil;
        if    (-d $fil)         { chkdir($fil); }
        elsif ($fil=~/html??$/) { chkfil($fil); }
    }
    closedir(DIR);
}

chkdir($startdir);

foreach ('$ndir','$nfil','$nhtm','$neln','$naln',
         '$nrln','$neln+$naln+$nrln','$nerr')
    { printf "%-20s:%6d\n",$_,eval($_); }
```

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Question 7 (5 points)
Define the concept of functional dependency and give an example.

Question 8 (5 points)
Explain the use and various forms of decision tables.

Question 9 (5 points)
Draw up a flow diagram based on the following decision table:

	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	R 16
C1	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
C2	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	N
C3	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N
C4	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
T1	X	X			X	X	X									
T2			X	X					X		X	X				
T3										X			X	X	X	
T4								X					X		X	X

Question 10 (5 points)

Write down the truth tables of the following expressions:

A AND NOT (B OR C)
A AND NOT B OR C
A OR (B AND (NOT C))
A OR B AND NOT C
NOT ((NOT A) OR (NOT B))
NOT ((NOT A) AND (NOT B))

Question 11 (5 points)

Write down the truth tables of the logical operators AND, OR and NOT, using the values TRUE, FALSE and NULL.

Question 12 (5 points)

Explain the normalisation process for the relational database model. Illustrate with examples.