



Sri Lanka Institute of Information Technology

B.Sc. Honours Degree in Information Technology  
Specialized in Computer Systems & Network Engineering

Final Examination  
Year 2, Semester 1 (2019)

IE2080 – Database Systems Administration

Duration: 2 Hours

October 2019

Instructions to Candidates:

- ◆ This paper is preceded by a 10-minutes reading period. The supervisor will indicate when answering may commence.
- ◆ This paper has 3 questions.
- ◆ Answer all questions in the booklet given.
- ◆ The total marks for the paper is 100
- ◆ This paper contains 5 pages, including the cover page.
- ◆ Electronic devices capable of storing and retrieving text, including calculators and mobile phones are not allowed

## **Question 1**

**(30 Marks)**

- a) “Database administrators (DBAs) use specialized software to store and organize data”. List five (5) responsibilities of database administrator. (5 marks)
- b) Sketch a component diagram of Oracle instance. (diagram should include all the components of memory structure and background processes). (5 marks)
- c) Briefly explain usage of following memory locations and background processes (8 marks)
  - i. Data Dictionary Cache
  - ii. Database Buffer Cache Control file
  - iii. DBWn
  - iv. LGWR
- d) Differentiate Oracle **user process** and **server process** (4 marks)
- e) ComTec (Pvt) Ltd.is a rapidly growing startup company which expecting to implement a strong database server to serve more than 500 clients all over the Sri Lanka. As a database administrator of a well-known company, recommend oracle server for ComTec by highlighting the features of Oracle server. (8 marks)

## **Question 2**

**(30 Marks)**

- a) List four main tablespaces that Oracle database should contains. (4 marks)
- b) Explain how logical storage expands as you insert data into a table in Oracle database  
Hint: You may use the relationship between physical and logical structure of Oracle DB (4 marks)
- c) Identify the main aspects that need to be considered in database planning. (5 marks)
- d) Figure 1 is a screenshot taken while the user trying to connect to the container database “dsaorcl”. Provide answers to the following questions by referring to figure 1.
  - i. An error message is indicated (figure 1) while trying to connect to the container database “dsaorcl”. Briefly explain the reason behind such an error? (3 marks)
  - ii. Recommend a solution to eliminate the error? (4 marks)

Hint: Provide suitable command to fix the issue

```
SQL> select dbms_xdb_config.gethttpsport() from dual;
select dbms_xdb_config.gethttpsport() from dual
      *
ERROR at line 1:
ORA-00904: "DBMS_XDB_CONFIG"."GETHTTPSPORT": invalid identifier

SQL> select con_id,instance_name,status from v$instance;

  CON_ID INSTANCE_NAME      STATUS
-----
      0 dsaorcl             MOUNTED
```

Figure 1: Error in logging to the container DB with current DB status

- e) Answer the below questions based on Oracle database shutdown process
- Compare **Shutdown normal** and **Shutdown immediate** modes (4 marks)
  - Using a diagram illustrates the Oracle database shutdown sequence indicating the states and file(s) used when switching from one state to another. (6 marks)

### Question 3 (40 Marks)

- List the benefits of managing the undo data in Oracle database. (4 marks)
- Provide answers to the following questions by referring the tnsnames.ora (figure 2) file located on the Oracle server

```
# tnsnames.ora Network Configuration File:
# /u01/app01/oracle1/product/11.2.0.3/dbhome_1/network/admin/tnsnames.ora
# Generated by Oracle configuration tools.
DBORCL.SIUE.EDU =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = pcsupport.lifewire.com)(PORT = 1521))
    )
    (CONNECT_DATA = (SID = DBORCL))
  )
EMTEST =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = pcsupport.lifewire.com)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = EMTEST.siue.edu)
    )
  )
LISTENER_DBAClass =
  (ADDRESS_LIST =
    (ADDRESS = (PROTOCOL = TCP) (HOST = 146.160.252.101) (PORT = 1523))
  )
```

Figure 2: tnsnames.ora

- i. Name the default listener port number. (1 mark)
- ii. Name the host that database is residing. (1 mark)
- iii. Name the instance that client connected with. (1 mark)
- iv. Identify the oracle the local listener port number if existing. (2 mark)

c) Compare **object privileges** vs **system privileges** in Oracle database management

(4 marks)

d) A database administrator has developed a container database named '**EXAMCDB**' with a single instance. A pluggable database '**EXAMPDB**' was created with '**Exam\_Schema**' activated. The system admin uses '**sqlplus**' utility for administration purpose.

- i. Name a query to connect with the sqlplus utility as system administration.(2 marks)
- ii. Identify a query to move from the container database to the pluggable database.

(4 marks)

iii. Construct a query to open the pluggable database if it is mounted at the moment.

(As shown in figure 3)

(4 marks)

```
SQL> select dbms_xdb_config.gethttpsport() from dual;
select dbms_xdb_config.gethttpsport() from dual
      *
ERROR at line 1:
ORA-00904: "DBMS_XDB_CONFIG"."GETHTTPSPT": invalid identifier

SQL> select con_id,name,open_mode from v$pdb;
```

CON_ID	NAME	OPEN_MODE
3	PDBORCL	MOUNTED

Figure 3: Error in logging to the pluggable DB with current PDB status

- iv. Write a query to set the port number of '**EXAMPDB**' into **5504**. (4 marks)
  - v. Construct a set of queries to create a role called '**ExamAdmin**', assign '**CREATE TABLE, CREATE VIEW**' privileges to the '**ExamAdmin**' role and revoke the '**CREATE SESSION**' privilege. (6 marks)
- Hint: You may have to write three queries. Use role password as '**exam123**'
- vi. Construct a query to assign user "**Kamal**" to the '**ExamAdmin**' role (2marks)

e) Explain **one** of the following concept related to Database Monitoring & Performance Tuning

- i. Database performance monitoring
- ii. Issues related to database performance
- iii. Automatic workload repository (AWR)
- iv. Automatic database diagnostic monitor (ADDM)
- v. v\$views
- vi. SQL tuning advisor
- vii. Database statistics

(5 marks)

END OF THE PAPER.