

UNIVERSITY EXAMINATIONS

1ST SEMESTER 2022/2023 ACADEMIC YEAR

**THIRD YEAR EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE (COMPUTER SCIENCE)**

COMP 316: ADVANCED DATABASE SYSTEM WITH ORACLE

STREAM: R

TIME: 2 HRS

DAY: TUES [2.30PM – 4.30PM]

DATE: 13/12/2022

THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES

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INSTRUCTIONS: - Answer Question 1 and Any Other Two.**QUESTION ONE: (30 MARKS)**

- (a) Define the following terms in reference to the Oracle Database. (8 Marks)
- I. Concurrency control
 - II. Data Dictionary
 - III. Atomicity of transaction
 - IV. Query cost
- (b) Two basic operations in Oracle transaction? (4 Marks)
- (c) What is the purpose of a system log in a transaction processing system? (4 Marks)
- (d) Does Oracle support ACID transactions? Explain how Oracle does this. (6 Marks)
- (e) Explain Distributed Query processing in Oracle. (4 Marks)
- (f) Outline how Oracle handles and recovers from a “Network failure”. (4 Marks)

QUESTION TWO: (20 MARKS)

- (a) Give Benefits of Oracle DDBs and briefly explain them. (10 Marks)
- (b) What are the two main issues in Oracle distributed design? Explain them in details and how Oracle resolves the two issues. (10 Marks)

QUESTION THREE: (20 MARKS)

- a) You have the following Oracle conceptual HR schema in a distributed database system. (10 Marks)

Employee (Emp#, name, age, salary, account, email, Dept#, level)

Department(Dept#, location, manager#)

Project (Proj#, Dept#, budget)

Employee, Department and Project are located at Hobart, Perth and Brisbane separately.

- Suppose the coordinating site of a transaction is Hobart. This transaction adds a new employee (Paul, age==38, salary== 80k) to department #8. Write a distributed transaction to perform this task, and show the 2PC (2 phase Commit) protocol of this transaction.

- b) Which two methods are supported for migrating your on-promises Oracle database to an Oracle Autonomous transaction Processing (ATP) database in Oracle cloud Infrastructure? Explain in details (10 Marks)

QUESTION FOUR: (20 MARKS)

- (a) Consider data models of two companies:
 In company A, employee records are stored in one table Emp
Emp(Emp#, Fname, Lname, Bdate, Dept#, Rank, Salary)
 In company B, employee records are stored in many tables one for each company department
Deptxxx(Sid, Fname, Sname, Position, Phone#, e mail, URL)
 Create a view to integrate all employee records in these two companies (suppose company B has two departments) (10 Marks)
- (b) Explain the advantages and disadvantages of using OODBMS. (5 Marks)
- (c) Explain how objects are stored in relational database. (5 Marks)

QUESTION FIVE: (20 MARKS)

- (a) Using a detailed diagram, explain the Oracle Database Design components. (20 Marks)