Level 6 Advanced Diploma in Business Administration & Database Technology (900) 161 Credits

Unit: Management Information Systems & SQL **Exam Paper No.:** 1	**Guided Learning Hours:** 500 **Number of Credits:** 50
Prerequisites: General database knowledge	**Corequisites:** A pass or better in Diploma in Business Administration or equivalence
Aim: This unit will integrate Management Information Systems (MIS) with Oracle SQL. MIS is undertaken as theory whilst Oracle SQL is undertaken as practical sessions. *Practical (Oracle SQL)* Oracle SQL offers learners an extensive introduction to data server technology. The unit covers the concepts of both relational and object relational databases and the powerful SQL programming language. Learners will learn to create and maintain database objects and to store, retrieve, and manipulate data; retrieve data by using advanced techniques such as ROLLUP, CUBE, set operators, and hierarchical retrieval. Learners will also learn to write SQL and SQL*Plus script files using the SQL*Plus tool to generate report-like output. Demonstrations and hands-on practice reinforce the fundamental concepts. Using the Oracle SQL*Plus environment, this computer-based training unit uses Structured Query Language (SQL) to create and populate Oracle database tables. Learners will acquire the skills necessary to create tables and other database objects, maintain and modify these data objects. The program detail processes to follow when inserting, updating and deleting data using SQL's Data Manipulation Language, control database transactions, control both user and object level security in an Oracle database. *Theory Management Information Systems (MIS)* MIS introduces the use of information systems in business organisations. The role of information systems in management, including current professional practices and methodologies are described. Topics covered include the general systems theory, decision theory, organisational models, types and benefits of information systems, systems planning and development, and management and control of information systems. Concepts of information systems, business process, hardware, software, systems analysis, e-commerce, enterprise systems and computer applications in organisations, techniques of systems analysis, systems designs, implementations, and information management (both technical and behavioural). Practical sessions focus on fundamentals of relational databases; relational data model, SQL and basic query formulation.	
Required Materials: Recommended learning resources.	**Supplementary Materials:** Lecture notes and tutor extra reading recommendations.
Special Requirements: Oracle SQL is a hands-on course, hence practical use of computers is essential. Requires intensive lab work outside of class time.	
Intended Learning Outcomes: ***Oracle SQL (Practical sessions)*** 1 The purpose of a database management system (DBMS); distinguishing a field from a record and a column from a row.	**Assessment Criteria:** ***Oracle SQL (Practical sessions)*** 1.1 Analyse components of a relational model 1.2 Describe relational database terminology 1.3 Describe the makeup of SQL statements 1.1 Explain the purpose of normalization 1.2 Describe the role of a primary key 1.3 Identify and evaluate partial dependency and transitive dependency in the normalization process 1.4 Explain the purpose of a foreign key 1.5 Determine how to link data in different tables through the use of a common field 1.6 Explain the purpose of a structured query language (SQL) 1.7 Identify and examine the basic

	components of an Entity-Relationship Model. 1.8 Define the types of relationships that can exist between entities. 1.9 Identify and evaluate the problems associated with many-to-many relationships and the appropriate solutions.
2 Distinguishing between a RDBMS and an ORDBMS; identify keywords, mandatory clauses, and optional clauses in a SELECT statement.	2.1 Describe how to select and view all columns of a table 2.2 Describe how to select and view one column of a table 2.3 Describe how to display multiple columns of a table 2.4 Explain using a column alias to clarify the contents of a particular column 2.5 Demonstrate performing basic arithmetic operations in the SELECT clause 2.6 Demonstrate removing duplicate lists, using either the DISTINCT or UNIQUE keyword 2.7 Analyse how to combine fields, literals, and other data 2.1 Analyse components of a basic SELECT statement 2.2 Explore rules and guidelines of constructing SQL statements 2.3 Investigate different methods of executing SQL statements 2.4 Define the keyword * (asterisk) 2.5 Define arithmetic expressions in SQL statements 2.6 Define NULL values 2.7 Define column aliases 2.8 Define literal character strings 2.9 Define how to suppress duplicate rows 2.10 Define SQL file commands 2.11 Define SQL editing command 2.19 Explain how to format query output results.
3 Using the WHERE clause to restrict the rows returned by a query and creating a search condition using mathematical comparison operators.	3.1 Define how to use the WHERE clause 3.2 Define comparison operators 3.3 Describe how character strings and dates are used in the WHERE clause 3.4 Describe the BETWEEN, IN, LIKE and IS NULL operators 3.5 Define SQL wildcard characters 3.6 Define logical operators 3.7 Define the ORDER BY clause 3.8 Demonstrate how to sort in SQL 3.9 Demonstrate how to specify a list of values for a search condition using the IN comparison operator 3.10 Demonstrate how to search for patterns using the LIKE comparison operator 3.11 Identify the purpose of the % and _ wildcard characters 3.12 Explain how to join multiple search

	conditions using the appropriate logical operator
	3.13 Demonstrate how to perform searches for null values
	3.14 Explain how to specify the order for the presentation of query results, using ORDER BY, DESC, ASC, and the SELECT clause
	3.15 Explain how to use SQL*Plus editing commands to edit the contents of the SQL*Plus buffer
	3.16 Demonstrate how to use the BETWEEN…AND comparison operator to identify records within a range of values
4 Creating a Cartesian join and defining how to create an equality join using the WHERE clause.	4.1 Define case conversion functions 4.2 Demonstrate creating an equality join using the JOIN keyword 4.3 Demonstrate creating a non-equality join using the WHERE clause 4.4 Demonstrate creating a non-equality join using the JOIN…ON approach 4.5 Describe how to create a self-join 4.6 Distinguish an inner join from an outer join 4.7 Describe how to create an outer join using the WHERE clause 4.8 Describe how to create an outer join using the OUTER keyword 4.9 Demonstrate using set operators to combine the results of multiple queries 4.10 Demonstrate joining three or more tables
5 Using the UPPER, LOWER, and INITCAP functions to change the case of field values and character strings; extract a substring using the SUBSTR function and determine the length of a character string using the LENGTH function.	5.1 Explain how use the LPAD and RPAD functions to pad a string to a desired width 5.2 Demonstrate using the LTRIM and RTRIM functions to remove specific character strings 5.3 Demonstrate rounding and truncating numeric data using the ROUND and TRUNC functions 5.4 Explain how to calculate the number of months between two dates using the MONTHS_BETWEEN function 5.5 Identify and correct problems associated with calculations involving null values using the NVL function 5.6 Describe how to display dates and numbers in a specific format with the TO_CHAR function 5.7 Identify and determine the current date setting using the SYSDATE keyword 5.8 Explain nest functions inside other functions 5.9 Identify when to use the DUAL table
6 Differentiating between single-row, multiple-row functions and outlining how to use	6.1 Demonstrate using the COUNT function to return the number of records

the SUM and AVG functions for numeric calculations.	containing non-NULL values 6.2 Demonstrate using COUNT(*) to include records containing NULL values 6.3 Demonstrate using the MIN and MAX functions with non-numeric fields 6.4 Identify and determine when to use the GROUP BY clause to group data 6.5 Identify when the HAVING clause should be used 6.6 Explain the order of precedence for evaluating WHERE, GROUP BY, and HAVING clauses 6.7 Evaluate and state the maximum depth for nesting group functions 6.8 Demonstrate how nest a group function inside a single-row function 6.9 Describe how to calculate the standard deviation and variance of a set of data, using the STDDEV and VARIANCE functions
7 Determining when it is appropriate to use a subquery, identifying which clauses can contain subqueries and distinguishing between an outer query and a subquery.	7.1 Demonstrate using a single-row subquery in a WHERE clause 7.2 Demonstrate using a single-row subquery in a HAVING clause 7.3 Demonstrate using a single-row subquery in a SELECT clause 7.4 Demonstrate using a multiple-row subquery in a WHERE clause 7.5 Demonstrate using a multiple-row subquery in a HAVING clause 7.6 Demonstrate using a multiple-column subquery in a WHERE clause 7.7 Describe how to create an inline view using a multiple-column subquery in a FROM clause 7.8 Explain how to compensate for NULL values in subqueries 7.9 Explain how to nest a subquery inside another subquery 7.10 Distinguish between correlated and uncorrelated subqueries. 7.11 Distinguish between single-row and multiple-row comparison operators
8 Creating a new table; the system privilege; the quota for the tablespace that contains the table, or the UNLIMITED TABLESPACE system privilege.	8.1 Define Oracle data types 8.2 Describe the components of CREATE TABLE statement 8.3 Describe how to INSERT data into a table 8.4 Describe the ALTER TABLE statement 8.5 Demonstrate how to modify a column 8.6 Demonstrate how to drop a column 8.7 Demonstrate how to rename a table 8.8 Demonstrate how to update rows 8.9 Describe how to name a new column or table 8.10 Demonstrate how to use a subquery to create a new table

	8.11	Demonstrate how to add a column to an existing table
	8.12	Demonstrate how to modify the size of a column in an existing table
	8.13	Demonstrate how to drop a column from an existing table
	8.14	Demonstrate how to mark a column as unused, then delete it at a later time
	8.15	Demonstrate how to rename a table
	8.16	Demonstrate how to truncate a table
	8.17	Demonstrate how to drop a table
9 The purpose of constraints in a table, distinguishing among PRIMARY KEY, FOREIGN KEY, UNIQUE, CHECK, and NOT NULL constraints and the appropriate use for each constraint.	9.1	Illustrate how to create and implement a sequence
	9.2	Describe how to create PRIMARY KEY constraints for a single column and a composite primary key
	9.3	Describe how to create a FOREIGN KEY constraint
	9.4	Describe how to create a UNIQUE constraint
	9.5	Describe how to create a CHECK constraint
	9.6	Describe how to create a NOT NULL constraint, using the ALTER TABLE…MODIFY command
	9.7	Explain how to include constraints during table creation
	9.8	Demonstrate using DISABLE and ENABLE commands
	9.9	Demonstrate using the DROP command
	9.10	Distinguish between creating constraints at the column level and table level
	9.11	Describe data integrity constraints
	9.12	Illustrate how to view constraints
	9.13	Define a sequence
10 Using substitution variables with an UPDATE command, issuing the transaction control statements COMMIT and ROLLBACK.	10.1	Describe how to add a record to an existing table
	10.2	Describe how to add a record containing a NULL value to an existing table
	10.3	Demonstrate using a subquery to copy records from an existing table
	10.4	Explain how to modify the existing rows within a table
	10.5	Describe how to delete records
	10.6	Describe how to use the SELECT…FOR UPDATE command to create a shared lock
	10.7	Differentiate between DDL, DML, and transaction control commands.
	10.8	Differentiate between a shared lock and an exclusive lock
11 The effect of the WITH READ ONLY option, the implication of an expression in a view for DML operations and inline views and the use of ROWNUM to perform a “TOP-N” analysis.	11.1	Demonstrate how to create a view, using CREATE VIEW command or the CREATE OR REPLACE VIEW command
	11.2	Explain how to employ the FORCE and NO FORCE options

	11.3 Describe the purpose of the WITH CHECK OPTION constraint 11.4 Demonstrate how to update a record in a simple view 11.5 Describe how to re-create a view 11.6 Demonstrate how to update a record in a complex view 11.7 Demonstrate how to drop a view 11.8 Identify problems associated with adding records to a complex view. 11.9 Identify the key-preserved table underlying a complex view
12 The purpose of a sequence, stating how it can be used by an organisation and why gaps may appear in the integers generated by a sequence.	12.1 Demonstrate using NEXTVAL and CURRVAL in an INSERT command 12.2 Explain when Oracle will automatically create an index 12.3 Explain how to create an index, using the CREATE INDEX command 12.4 Describe how to delete an index, using the DELETE INDEX command 12.5 Describe how to create a PUBLIC synonym 12.6 Describe how to delete a PUBLIC synonym 12.7 Demonstrate how to correctly use the CREATE SEQUENCE command to create a sequence. 12.8 Identify which options cannot be changed by the ALTER SEQUENCE command. 12.9 Identify the contents of different versions of views used to access the data dictionary, based on the prefix of the view.
13 The concept of authentication, creating a new user account and granting a user the CREATE SESSION privilege.	13.1 Explain how to make a password expire 13.2 Describe how to change the password of an existing account 13.3 Describe how to create a role; grant privileges to a role 13.4 Outline how to assign a user to a role 13.5 Demonstrate how to revoke privileges from a user and a role 13.6 Describe how to drop a user
14 Adding a column heading with a line break to a report and formatting the appearance of numeric data in a column, specifying the width of a column.	14.1 Demonstrate how to add a multiple-line header to a report 14.2 Demonstrate how to display a page number in a report 14.3 Demonstrate how to add a footer to a report 14.4 Demonstrate how to change the setting of an environment variable 14.5 Demonstrate how to suppress duplicate report data 14.6 Explain how to clear changes made by the COLUMN and BREAK commands 14.7 Describe how to perform calculations in a report

	14.8 Demonstrate how to substitute a text string for a NULL value in a report
(Theory sessions) **Management Information Systems** 1 Understand how the development and management of information technology tools assist executives and the general workforce in performing any tasks related to the processing of information; including the basic objects that computers process; computer hardware, computer software; processes that communicate with other essential parts.	***(Theory sessions)*** **Management Information Systems** 1.1 Describe why information technology is important 1.2 Define e-commerce and e-business 1.3 Describe why business is changing and what managers will need to know in the future. 1.4 Demonstrate if technology alone can improve a business. 1.5 Explain why strategic decisions are difficult. 1.6 Describe the main components of a computer. 1.7 Explain why the operating system is important. 1.8 Justify how the Internet is likely to change the role of computers 1.9 Describe the main software applications used in business 1.10 Describe how information is processed 1.11 Describe the roles and tasks the MIS department performs 1.12 Describe MIS jobs available and how much it costs to hire IT employees 1.13 Describe centralisation and decentralisation
2 Computer networks, wireless networks, internet, general computer networking solutions and telecommunications in use today; and the importance of computer security and the process of preventing and detecting unauthorised use of your computer.	2.1 Analyse the value of a single computer. 2.2 Describe what is needed to install and create a network. 2.3 Describe why it matters how the computer is connected to the network. 2.4 Describe Internet, how is it controlled, and how does it work. 2.5 Describe the problems likely to be encountered if one needs to connect to a supplier in a different country. 2.6 Demonstrate why computer networks are important in today's businesses 2.7 Describe the primary threats to an information system. 2.8 Describe the primary options used to provide computer security. 2.9 Describe the non-computer-based tools can be used to provide additional security. 2.10 Describe additional benefits provided by encryption. 2.11 Describe computer crime. 2.12 Describe special security problems arise in e-commerce. 2.13 Describe the process of protecting information resources
3 Database transactions and operations, executing the database operations, improving the	3.1 Define and describe database transaction 3.2 Describe the process of controlling and

database performance.	management database transactions 3.3 Describe the major elements and risks of a database transaction. 3.4 Describe how a database transaction is written to a computer. 3.5 Explain, relate and analyse database software programs.
4 Understand how data is combined across functional areas, including production, purchasing, marketing, and accounting.	4.1 Explain how data can be combined across functional areas, including production, purchasing, marketing, and accounting. 4.2 Describe the process of tracking and comparing financial information of a firm. 4.3 Describe the transaction elements in the human resources management system 4.4 Explain how production be made more efficient. 4.5 Describe enterprise integration. 4.6 Describe the process of integrating data and systems.
5 The role of Management Information System; how do businesses make decisions; analysing good and bad decisions.	5.1 Define and describe Decision Support System (DSS) 5.2 Describe how decision support systems differs from a traditional information system 5.3 Describe how a decision support system help analyse data 5.4 Describe an expert system. 5.5 Define an intelligent machine. 5.6 Describe how more intelligent systems benefit e-business. 5.7 Describe how the use of information technology can improve an organisation. 5.8 Explain are the main factors affecting a firm's competitive advantage 5.9 Describe how IT can be used to gain a competitive advantage. 5.10 Explain how IT support the operations of the firm to provide a competitive advantage. 5.11 Describe why it is difficult to convince management to make strategic changes. 5.12 Describe the risks of strategic decisions.
6 The development project framework; including a project lifecycle and delivery of a major project.	6.1 Describe the main options for building information systems. 6.2 Describe other methodologies apart from System Development Life Cycle (SDLC) approach. 6.3 Analyse and annotate a process-based system. 6.4 Describe how object-oriented design is different from process design. 6.5 Describe how to control a major development project and why is control so important

7 Understand analytical and theoretical framework describing the relation between Information Management and Society. .	7.1 Describe the influence of multinationals on today´s society 7.2 Describe the role of business in society 7.3 Examine and analyse the relationship between time and information technology 7.4 Describe how information technology affects society. 7.5 Describe how technology affects jobs. 7.6 Explain if technology changes the relationship between businesses and consumers. 7.7 Describe how technology affects different areas of society. 7.8 Explain how information technology improves governments. 7.9 Describe the major laws that affect technology and the use of computers. 7.10 Describe on the controversy between Management and Information Systems and Society
Methods of Evaluation: A 3-hour essay written examination paper with 5 questions, each carrying 20 marks. Written examination questions will be based on Management Information System only. Candidates are required to answer all questions. Candidates also undertake project/coursework in both Management Information System (MIS) and Oracle SQL, each with a weighting of 50% [making a total of 100% for the two].	

Recommended Learning Resources:
Management Information Systems & Database Technology

Text Books	**SQL/Relational Database** • Database Concepts by David M. Kroenke 2nd Edition. • Database Design, Application Development & Administration. • Database Management Systems by Jerry Post. ISBN 0072472421 • Database Processing – Fundamentals, Design and Implementation. • Relational Database Principles (Paperback) by C. Ritchie (Author). • Relational Database Design and Implementation: Clearly Explained 3e: Clearly Explained (Paperback) by Jan L. Harrington. ISBN-10: 0123747309 **Management Information Systems** • Management Information Systems (Paperback) by T. Lucey. ISBN-10: 1844801268 • Information Systems Management in Practice (Paperback) by Barbara C. McNurlin and Ralph H. Sprague. ISBN-10: 0131968777 • Essentials of Management Information Systems (Hardcover) by Jane P. Laudon and Kenneth C. Laudon. ISBN-10: 0130193232
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	Oracle SQL Plus