Tutorial Letter 101/3/2018

Database Design

ICT3621

Semesters 1 and 2

School of Computing

This tutorial letter contains important information about your module.

BARCODE

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Dear Student

1 INTRODUCTION

Dear Student

We would like to welcome you to the School of Computing. It forms part of the College of Science, Engineering and Technology (CSET). It is based at Science Campus former Florida Campus. The module Database Design (ICT3621) is offered as part of the National Diploma in Information Technology within School of Computing.

This module focuses on the design aspects of a database. We will focus on selected chapters in your prescribed textbook; there fore it is important to get hold of the prescribed textbook as soon as possible. Please note that you MUST use the exact title and edition specified in 4.1 on page 6 in order to make life easier for you.

Due to regulatory requirements of the university and the Department of Higher Education of South Africa, the following applies: In order to obtain admission to the examination, you must submit Assignment 1. There are two assignments for this module, both of which will contribute towards your year mark for this module. The year mark counts 20% towards your final mark for this module. Your lecturer is only responsible for marking of your assignments not the administration part of it.

In this tutorial letter (Tutorial Letter 101) you will find the purpose of and the learning outcomes for this module. It also contains the assessment criteria and the assignments for the module. Furthermore, this tutorial letter comprises information regarding the prescribed study material and also additional support information. Please study this information carefully and make sure that you obtain the prescribed material as soon as possible.

Please note that this is the only tutorial letter which will be sent to you. You have to download the other tutorial letters from the online learning portal, myUnisa (https://my.unisa.ac.za/portal). Your lecturer for this module is not responsible for academic not content not other administration duties such as extensions of assignments and examination related queries.

We hope that you will enjoy this module and we wish you all the best.

Regards

Your lecturers

2 PURPOSE AND OUTCOMES

2.1 Purpose

This module is designed to introduce you to the fundamental principles of databases and database management systems, covering both single and distributed database systems and relational databases. The module also deals with aspects such as normalisation, entity relationships, transaction management and concurrency control, data warehousing and data administration.

2.2 Outcomes

The specific outcomes for this module as as follows:

Database Design	
Learning Outcome 1	Demonstrate a sound knowledge of the importance of a Database Management System (DBMS) and database design
Learning Outcome 2	Demonstrate sound knowledge of data modeling
Learning Outcome 3	Create a logical view of the data
Learning Outcome 4	Create a conceptual database as viewed by the end user
Learning Outcome 5	Evaluate and improve a set of table structures
Learning Outcome 6	Demonstrate sound knowledge of the basic object oriented database concepts

3 LECTURER(S) AND CONTACT DETAILS

3.1 Lecturer(s)

The names of the lecturers for each module and their contact details within School of Computing are updated every year and will be given to you in a Tutorial Letter 301 or Tutorial Letter 302. These letters are issued by the School of Computing and not by individual lecturers. It will be posted to you and will also be uploaded on myUnisa. The tutorial letter will include up-to-date contact details of your lecturer (e-mail addresses, telephone numbers and office numbers). In order to find the days and times when your lecturer will be available, please visit *myUnisa* and go to the home page for this module. The details of the lecturer will be made available on the module website on myUnisa at the beginning of the semester.

Please note that lecturers are only available for academic queries such as enquiries about this module's academic content. The lecturer is not responsible for administrative enquiries such as examination timetables. Please visit *myBrochure* for contact details of the relevant departments. The contact details of the lecturer will be posted on the home page of the module. If you would like to have a meeting with a lecturer, you will need to make an appointment. The lecturer will not attend to any students who show up at his/her office without an appointment.

3.2 Department

The module is offered by the School of Computing (SoC), which is part of the College of Science, Engineering and Technology (CSET). The School's contact details are as follows:

- Reception: 011 471 2816
- Website address: https://osprey.unisa.ac.za
- Physical address: Science Campus (former Florida Campus)
  Cnr Christian de Wet and Pioneer Streets
  Florida
  GJ Gerwel Building, floor 4

3.3 University

If you need to contact the university about matters not related to the academic content of this module, please consult the *Study @ Unisa* publication which you received with your study material. You can download the brochure online from http://www.unisa.ac.za/Default.asp?Cmd=ViewContent&ContentID=26528. This publication contains information on how to contact the university, especially different departments such as Assignments, Finance, Examinations and so forth. Here are some of the ways to communicate with the university:

- Unisa website: http://www.unisa.ac.za/default.html
- myUnisa: https://my.unisa.ac.za/portal
- E-mail: info@unisa.ac.za

4 RESOURCES

4.1 Prescribed books

Please make sure that you purchase the prescribed textbook for this module as soon as possible. The details of the prescribed textbook as follows:

Title: *Database Systems, Design, Implementation and Management*
Edition: 12th
ISBN: 13: 978-1-305-62748-2
Publisher: Cengage Learning
Authors: Carlos Coronell and Steven Morris

- Please make sure that you buy the textbook as soon as possible to avoid delaying your study programme.
- Please consult the list of official booksellers and the addresses listed in *Study@Unisa.*
- The assignments, exams and tutorial letters are based on the prescribed work.

The previous edition of the prescribed textbook is not sufficient enough to prepare for all the assignments and examinations especially for this semester and this academic year.

4.2 Library services and resources information

For brief information, go to www.unisa.ac.za/brochures/studies

For detailed information, go to the Unisa website at http://www.unisa.ac.za/ and click on **Library**.

For research support and services of personal librarians, go to http://www.unisa.ac.za/Default.asp?Cmd=ViewContent&ContentID=7102.

The library has compiled a number of library guides:

- finding recommended reading in the print collection and e-reserves – http://libguides.unisa.ac.za/request/undergrad
- requesting material – http://libguides.unisa.ac.za/request/request
- postgraduate information services – http://libguides.unisa.ac.za/request/postgrad
- finding, obtaining and using library resources and tools to assist in doing research – http://libguides.unisa.ac.za/Research_Skills
- how to contact the library/finding us on social media/frequently asked questions – http://libguides.unisa.ac.za/ask

5 STUDENT SUPPORT SERVICES

5.1 myUnisa

For the purposes of this module you should have access to a computer that is linked to the internet. This would enable you to access the required resources and information timeously. The *myUnisa,* an official learning management system is Unisa's online campus, which enables you to communicate with your lecturers, with other students and with the administrative departments of *Unisa* via a computer and the internet.

To go to the myUnisa website, start at the main Unisa website, http://www.unisa.ac.za and then click on the ***Login to myUnisa*** link on the right-hand side of the screen. This should take you to the myUnisa website. You can also go there directly by typing in https://my.unisa.ac.za. You will be able to download your tutorial matter from *myUnisa*.

You are welcome to use the discussion forum for each module on *myUnisa*. This discussion forum enables students to communicate with one another, but may only be used for academic matters. The lecturers will not participate actively in the discussion forum; therefore you should not post urgent questions for a lecturer's attention here. We advise you to e-mail urgent academic questions to your lecturers to ensure that you receive a speedy answer.

Consult the publication *Study @ Unisa,* which you have received with your study material, for more information on *myUnisa*

5.2 E-tutors

The university provides e-tutors to students. E-tutors are there to provide learning support related to academic content to registered students. This module has an e-tutor. The information regarding your e-tutor will be communicated during the course of the semester.

5.3 Telecentres

The University of South Africa has entered into partnerships with different establishments. These establishments are called telecentres. These telecentres are based in various locations across South Africa. The main purpose is to provide students with free access to computers and internet access. This access enables students to perform academic-related activities which include registration, online submission of assignments, engaging in e-tutor activities and signature courses, and so forth. Please note that any activities other than these – such as printing, photocopying and so forth – are for your own account. If you need more information on telecentres, please visit www.unisa.ac.za/telecentres.

6 STUDY PLAN

Please use your *Study @ Unisa* brochure for general time management and planning skills. Use the module-specific study plan below to plan your studies for ICT3621.

Week	Chapter	Activities	Notes
1	Chapter 1	Study chapter 1	
2	Chapter 2	Study chapter 2	
3	Chapter 3	Study chapter 3 and start Assignment 01	
4	Chapter 4	Study chapter 4	
5	Chapter 5	Study chapter 5	
6	Chapter 6	Study chapter 6	
7	Chapter 9	Study chapter 7	

7 ASSESSMENT

7.1 Assessment criteria

Specific Outcome 1:

- Identify the advantages and disadvantages of a DBMS
- Describe the advantages of good database design
- Identify the advantages and disadvantages of a DBMS are correct and according to the theory
- Demonstrate descriptions of concepts using diagrams

Specific Outcome 2:

- Utilize graphical representations of real world data structures
- Create a data model that represents data structures, their characteristics, relations, constraints and transformations
- Demonstrate understanding of the organization for which the database design is developed via database model
- Graphical representations of Entity Relationship Diagrams (ERDs) and dependency diagrams
- Create ERD and dependency diagrams based on requirements
- Distinguish between entities, attributes and relationships among them

- Apply business rules to the data model of the business for which the database is designed

Specific Outcome 3:

- Create logical representation of the data in the form of a set of logical constructs (tables) which contain all necessary attributes
- Create a logical representation of the data that clearly demonstrate the tables' characteristics, namely keys, attributes and dependencies
- Use computer tools to draw different diagrams

Specific Outcome 4:

- Develop a conceptual view of the data as perceived by the end user, in the form of a conceptual model or entity relationship diagram (ERD)
- Develop the ERD depicting the database's main components, namely entities, attributes, connectivities, cardinalities and relationships

Specific Outcome 5:

- Improve a set of tables by removing unnecessary/redundant data fields, in other words, normalizing the database to avoid anomalies
- Normalize the database to at least 3rd normal form
- Normalize the database clearly to indicate primary keys and foreign keys and attributes for each entity
- Normalize to the extent that the database structure is less complicated and reflect the organization's real operations

Specific Outcome 6:

- Create a basic object-oriented database representation that clearly demonstrates the relationships between the classes, using given data information

7.2 Assessment plan

You are required to complete and submit two (2) COMPULSARY assignments and write one final examination in this module.

- Assignment 01 contains multiple-choice questions.
- Assignment 02 is a written assignment.
- You will write a two-hour examination at the end of the semester. The examination questions will cover all the examinable chapters.

All three assessments (i.e. the two assignments and the examination), contribute towards your final mark for the module.

Your final mark will be calculated as follows:

Assignment 01 (20%) + Assignment 02 (80%) = Year mark (100%)

Year mark (20%) + Exam mark (80%) = Final mark

7.3 Assignment numbers

7.3.1 General assignment numbers

This module consists of two assignments per semester. It is compulsory to submit Assignment 01 on due or before the due date. This is the assignment that will make you qualify for examination. Assignment 01 is an MCQ assignment (i.e. it consists of multiple-choice questions) and Assignment 02 is a written assignment. Please make sure that you submit the correct assignment for a particular semester. Each assignment has its own unique number. When completing and submitting an assignment, please make sure that you use the number associated with that particular assignment.

8.3.2 Unique assignment numbers

Assignment Number	UNIQUE Number: Semester 1	UNIQUE Number: Semester 2
01	837430	705666
02	682053	887313

7.4 Assignment due dates

Assignment Number	Due Date: Semester 1	Due Date: Semester 2
01	23 March 2018	24 August 2018
02	20 April 2018	14 September 2018

- The lecturer is not responsible for the extension of assignment due dates of assignments.
- A lecturer adheres with the due dates of the assignment as stipulated in a tutorial letter.

7.5 Submission of assignments

All the assignments are submitted online. Please ensure that you submit the assignment on or before the due date. If you are experiencing any problems with submission of assignments, please consult the universities Assignments department (the contact details are available online). Please make sure that you are submitting the correct assignment with the correct unique assignment number. The lecturers will only mark the assignment which they receive and they are only responsible with the marking of the assignments. For marking purposes, please ensure that you submit Assignment 02 in PDF format and that the file is not a "read only" file.

7.6 The assignments

Assignment 1: Semester 1

1. Which one of the following is NOT an extended-relationship model construct?
   1. Entity supertype
   2. Entity subtype
   3. Entity integrity
   4. Entity clustering

2. Which one of the following in the Entity Relationship Model provides the same information as the connectivity, cardinality and relationship participation constructs as in the UML model?
   1. Entity –relationship diagram
   2. Association
   3. Multiplicity
   4. Entity

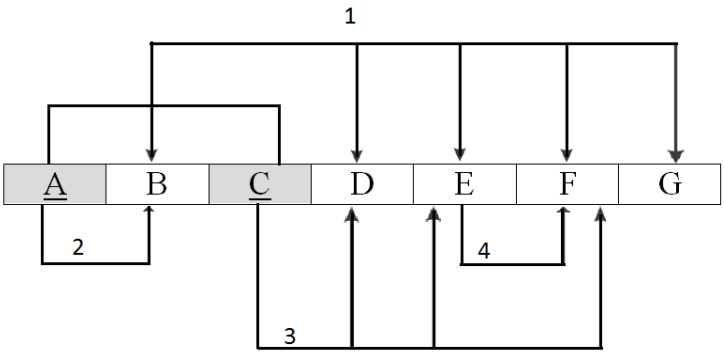
3. A relation/ table is in 2nd Normal Form if
   A. It is in 1st Normal Form
   B. It includes no partial dependencies
   C. It includes no transitive dependencies
   D. It has a composite key and no non-key attribute should be dependent on part of composite key

   Which of the following combination is correct?
   1. A and B
   2. A, B and C
   3. A, B and D
   4. A and D

4. A(n) _____ represents a global view of the entire database by the entire organization

1. conceptual schema
2. external model
3. internal schema
4. conceptual model

5. Based on the diagram below, which number represents transitive dependency?



1NF dependency diagram

1. 1
2. 2
3. 3
4. 4

6. Using the diagram in question 5, What are the dependencies depicted by the following relationships?

A. A → B(1)

B. C → D, E, F(2)

C. E→F(3)

1. Transitive dependency, transitive dependency and partial dependency
2. Transitive dependency, partial dependency and transitive dependency
3. Partial dependency, transitive dependency and partial dependency
4. Partial dependency, partial dependency and transitive dependency

7. Which one of the following is NOT a problem inherent in a many-to-many entity relationship?
   1. It leads to loss of data
   2. It leads to data redundancies
   3. It leads to system-efficiency errors
   4. Relational operations become very complex

8. The condition in which every reference to an entity instance by another entity instance is valid is called _____
   1. foreign key
   2. referential integrity
   3. secondary key
   4. entity integrity

9. _____ defines the theoretical way of manipulating table contents using relational integrity.
   1. Relations
   2. Closure
   3. Relational algebra
   4. Relvar

10. Which attribute that that must have a value; in other words, it cannot be left empty?
   1. Require attribute
   2. Optional attribute
   3. Identifiers
   4. Relational schema

11. Which of the following is not an advantage of DBMS?
   1. Improved data access
   2. Better data integration
   3. Limited data sharing
   4. Increased end-user productivity

12. Which of the following is not a characteristic of relation which is in 3NF?
    1. It is in 1NF
    2. It is in 2NF
    3. It contains partial dependencies
    4. It contains no transitive dependencies

13. Which model has the following characteristics?
    A. Less semantics in data model
    B. Based on schema-less-key-value data model
    C. Address big data problem
    D. Best suited for large sparse of data stores
    1. Relational model
    2. Entity relationship model
    3. Object-Oriented Model
    4. NoSQL

14. Which of the following is NOT a property of a relation?
    1. Column must be able to handle different data formats
    2. Table is perceived as a two-dimensional structure composed of rows and columns
    3. Each table column represents an attribute and each column has distinct name
    4. Each column has a specific range of values known as attribute domain

15. What is it called an attribute that cannot be further subdivided to yield additional attributes?
    1. Composite attribute
    2. Simple attribute
    3. Single-valued attribute
    4. Multivalued attribute

16. Which type of entity that cannot exist in the database provided there is another type of entity that also exists within the database, but does not require that the identifier of that other entity be included as part of its own identifier?
    1. Weak entity
    2. Strong entity
    3. ID-dependent entity
    4. ID-independent entity

17. What type of relationship where by the entity COURSE is a prerequisite for another course?
    1. Unary relationship
    2. Binary relationship
    3. Ternary relationship
    4. Recursive relationship

18. Which of the following statement regarding relationship degrees is not true?
    1. Unary relationship is an association between more than two single entities
    2. It indicates the number of entities or participants associated with a relationship
    3. Ternary relationship is an association between three entities
    4. Binary relationship is the association of two entities

19. Which of the following is not a reason why business rules are important for database design?
    1. They allow a designer to understand the nature, role and scope of data
    2. They can be a communication tool between users and designers
    3. They help standardise the company's view of data
    4. They allow the designer to change the business processes

20. Suppose that the COURSE and CLASS entities are defined as follows:
    COURSE (CRS_CODE, DEPT_CODE, CRS_DESCRIPTION, CRS_CREDIT),
    CLASS (CLASS_CODE, CRS_CODE, CLASS_SECTION, CLASS_TIME).\
    What types of a relationship do the above entities have?
    1. Existence-dependent relationship
    2. Identifying relationship
    3. Non-identifying relationship
    4. Super relationship

21. Many-to-many relationship creates a problem, which of the following can easily avoid it?
    1. Creating a composite entity
    2. Through a means of a secondary entity
    3. Through mean of a candidate key
    4. Reducing a number of entities in a database

22. What is meant by the term multiplicity 1..*?
    1. Minimum of zero and a maximum of many instances of this class are associated with am instance of the other related class (indicates an optional class)
    2. Minimum of zero and a maximum of one instance of this class are associated with an instance of the other related class (indicates a mandatory class)
    3. Minimum of zero and a maximum of one instance of this class are associated with an instance of the other related class (indicates an optional class).
    4. Minimum of one and a maximum of many instances of this class are associated with an instance of the other related class (indicates a mandatory class).

23. A _____ is an attribute which its values match the primary key values of another table.
    1. super key
    2. foreign key
    3. secondary key
    4. candidate key

24. Which of the following is NOT an example of DBMS?
    1. MS SQL Server
    2. Oracle
    3. UNIX
    4. MySQL

25. Relational database model enables one to view data _____ as compared to _____
    1. relationally, hierarchically
    2. hierarchically, relationally
    3. logically, physically
    4. physically, logically

Assignment 02: First Semester

Question 1: **[25]**

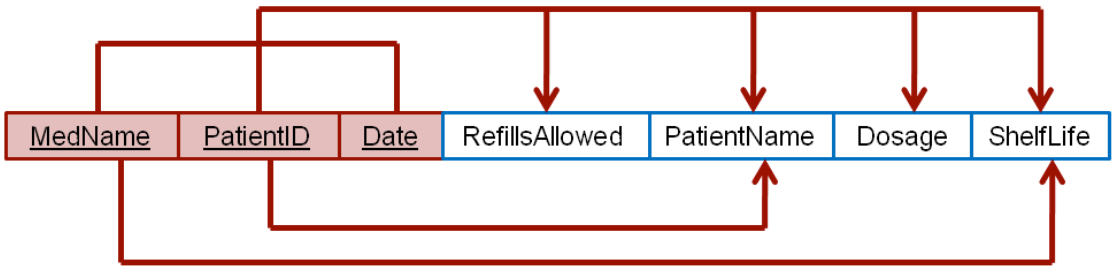
Different retail stores have seasons where by they are busy and it is known ad Peak Periods. A company known Nxumalo Employment Corporation (NEC) provides human resource services to different retail stores. Nxumalo Employment Corporation places the temporary workers into different retail stores during peak periods. The description of the operations that were provided by their managing director.

- NEC has a file of candidates who are willing to work
- If the candidate has worked before, there is a job history for that particular candidate. Each time a candidate works then an additional job history is added to the candidate
- The candidates have a qualification and at times single candidate earns more than one qualification. The same qualification can be earned by different candidates
- NEC provides services to different retail stores
- Every time a retail store requests a candidate to work for them, they create a file or folder which contains information such as file ID, retail name, required qualification, start date, end date and the rate
- The opening of a file requires a one specific qualification
- When a particular candidate has that particular qualification, he or she is given that particular job and entry placement Record File is made. This file contains the candidate ID, total numbers of hours to work and the rate of the job. In addition to that, an entry on the job history is made for that particular candidate
- An opening can be filed by many candidates and a single candidate can filly more than one opening

Create an ERD diagram using UML notation for this particular organisations, please ensure the following

- Correct notation is used
- All the relationships are represented
- All the entities are represented and are clearly marked how they relate to other entities.
- List the activities and example using the current ERD developed of the activities followed when creating an ERD

Question 2: **[20]**



2.1. Use the above diagram, create a database that which tables are at least 2NF showing the dependency diagram for each table (11)

2.2. When is a table in 3NF? (2)

2.3. What is a partial dependency? Which what normal form is it associated with? (3)

2.4. What are three data anomalies which result into data redundancy and provide a way to eliminate it? (4)

Question 3: **[20]**

The major reason for using DBMS is to ensure the integrity and consistency of the data within the database system. The functions of the DBMS are transparent to the end user and are achieved mostly through the usage of a DBMS. Discuss DBMS and every function of a DBMS.

Question 4: **[20]**

4.1. The main objective of normalization process is to ensure that each table conforms to the concept of well-formed relations. List four characteristics of the table that conform to normalization. (4)

4.2. Improving the design of the database is important. It is done in order to improve database's ability to provide information and on enhancing its operational characteristics. List and discuss the issues or aspects that needs to be considered in order to improve database design **(**16)

Question 5: **[15]**

5.1. Although database systems yield considerable advantages over previous data management approaches. Database management do provide significant disadvantages that are overlooked more often. Discuss disadvantages of database system (10)

5.2. List five characteristics of Big Data and NoSQL Database (5)

Assignment 01: Second Semester

1. A _____ is a character or group of characters that has a specific meaning.
    1. file
    2. field
    3. record
    4. database

2. The phrase _____ refers to an organization of components that define and regulate the collection, storage, management and use of data within a database environment.
    1. database management system
    2. database management
    3. management system
    4. database system

3. A(n) _____ is bidirectional.
    1. entity
    2. attribute
    3. constraint
    4. relationship

4. Business rules are derived from _____
    1. a detailed description of an organization's operations.
    2. standards and practices developed over the years
    3. government oversight organization standards
    4. managers' recommendations

5. A CUSTOMER table's primary key is CUS_CODE. The CUSTOMER primary key column has no null entries, and all entries are unique. It is an example of _____

   1. null
   2. entity
   3. complete
   4. referential

6. Derived attributes are stored in a _____

   1. special derived table
   2. on the table on which the attributes are used to derive it
   3. stored in a hard special storage
   4. none of the above

7. Cardinalities in an ERD are indicated using a _____ notation.

   1. (max, min)
   2. (min, max)
   3. [min…max]
   4. {min|max}

8. A(n) _____ is a generic type that is related to one r more entity subtypes.

   1. subtype discriminator
   2. inheritance
   3. specialization hierarchy
   4. entity supertype

9. The conflicts between design efficiency, information requirements and process speed are often resolved through _____

   1. conversion from 1NF to 2NF
   2. conversion from 2NF to 3NF
   3. compromises that include denormalization
   4. conversion from 3NF to 4NF

10. Which of the following represents an example of a candidate key?

    1. STU_NUM → STU_LNAME
    2. STU_NUM, STU_LNAME
    3. STU_NUM
    4. STU_NUM, STU_LNAME → STU_ID

11. Which data model provides ad hoc queries?

    1. Relational
    2. Entity Relationship
    3. Objected-Oriented
    4. NoSQL

12. Which of the following is not a reason why business rules are important during database design?

    1. They allow the designer to understand the nature, role and scope of data
    2. They can be a communications tool between users and designers
    3. They help to standardize the company's view of data
    4. They allow the designer to change the business processes.

13. Which statement is NOT true about information?

    1. Data constitutes the building block of information
    2. Information is produced by processing knowledge
    3. Information is used to reveal the meaning of data
    4. Accurate, relevant and timely information is the key to good decision making

14. A relation is said to be in 2NF if:

    A. It is in 1NF

    B. It includes no partial dependencies

    C. It includes no transitive dependency

    D. It has a composite key and no non-key attributes should be dependent on part of the composite key

Which of the following combination is correct?

1. A and B
2. A, B and C
3. A, B and D
4. A and D

15. An integrated non-volatile collection of data that provides support for decision making is called _____

1. business intelligence
2. data warehouse
3. data integrity
4. primary key

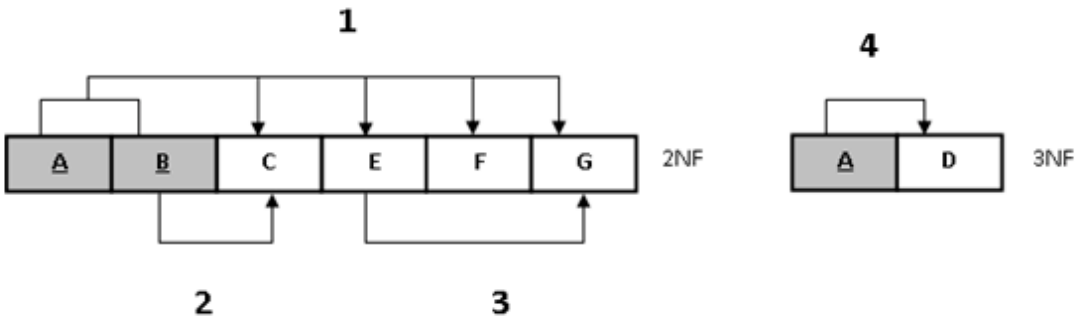
16. Which type of entity cannot exist in the database unless another type of entity also exists in the database, but does not require that the identifier of that other entity be included as part of the identifier

1. Weak entity
2. Strong entity
3. ID-dependent entity
4. ID-independent entity

17. If you have three different transitive dependencies, _____ different determinant(s) exist

1. one
2. two
3. three
4. four

18. From the diagram below, choose the number that correctly represents transitive dependency.



1. 1
2. 2
3. 3
4. 4

19. What is meant by the multiplicity 1..*?

1. Minimum of zero and a maximum of many instances of this class are associated with an instance of the other related class (indicates an optional class)
2. Minimum of one and a maximum of one instance of this class are associated with an instance of the other related class (indicates a mandatory class).
3. Minimum of zero and a maximum of one instance of this class are associated with an instance of the other related class (indicates an optional class).
4. Minimum of one and a maximum of many instances of this class are associated with an instance of the other related class (indicates a mandatory class).

20. Which one of the following is NOT an extended-relationship-model construct?

1. Entity supertype
2. Entity subtype
3. Entity integrity
4. Entity clustering

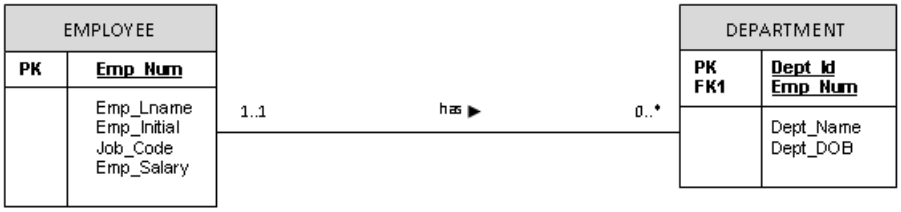
21. Which of the following statement is not correct about specialization hierarchy?

1. Relationship are sometimes described in terms of an IS-A relationship
2. The specialization hierarchy can have only one level of supertype/subtype relationship
3. A subtype can exist only within the context of a supertype and every subtype can have only one supertype to which it is directly related
4. The specialization hierarchy supports attribute inheritance

22. A relationship such as “a student attends one or more classes” represents which one of the following types of relationship

1. Unary relationship
2. Binary relationship
3. Ternary relationship
4. Recursive relationship

23. Using ERD below, what type of relationship between EMPLOYEE and DEPARTMENT?



1. Identifying relationship
2. Partial relationship
3. Weak relationship
4. Optional relationship

24. Using the diagram in question 23, what is the relationship between EMPLOYEE and DEPARTMENT?

1. One-to-many relationship
2. Many-to-Many relationship
3. One-to-one relationship
4. None of the above

25. Using the diagram in question 23, what is Emp_Num in department table?
    1. Foreign key
    2. Primary key
    3. Composite primary key
    4. None of the above

Assignment 02: Second Semester

1.	Discuss decision-making process	(14)
2.	Discuss common Decision Support Systems (DSS) analysis techniques	(8)
3.	Define big data and the common characteristics of big data	(10)
4.	Discuss data mining process model and define its primary phases	(15)
5.	Provide reasons why business analytics is difficult from operational databases	(6)
6.	Discuss the data-driven website and its advantages.	(10)
7.	Discuss core drivers of information age provide example for each	(12)
8.	Discuss structured data and unstructured data	(9)
9.	Discuss SWOT Analysis with the understanding business strategies	(8)
10.	Define customer key players of customer relationship management	(8)

7.8 The examination

This module has a paper-based examination: you will write a two-hour paper. To qualify for the examination, students need to submit the assignments for a particular semester. The examination date and venue will be communicated in due time by the Examination Department. The lecturer is not responsible for examination details or administration; these are the responsibility of the Examination Department. Any queries regarding the examination should also be directed to the Examination Department.

An examination tutorial letter will be provided during the progress of the semester. This tutorial letter will outline the format and structure of the examination and will only be available on myUnisa. An announcement will be posted to inform students when this tutorial letter becomes available. Needless to say, the specific questions for the examination will not be given to you beforehand

8 IN CLOSING

The main aim of this tutorial letter was to outline the basic information that you will require during your study of this module. This tutorial letter contains the important information that you will need in order to complete this module successfully and enjoy your journey while doing this module. This tutorial letter is the only tutorial letter you are going to receive as a hard copy. You will need download other tutorial letters from UNISA learning management system. We wish you all the best on your studies