Tshwane University of Technology

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YEAR: 2016

EXAMINATION: B

November Supplementary

SUBJECT NAME:	ISY34AT
SUBJECT CODE:	Information Systems IIIA
QUALIFICATION(S):	NDIS12 NDIS04

PAPER DESCRIPTION: Closed Book **DURATION:** 3 Hrs **PAPER:** Only

SPECIAL REQUIREMENTS

- [x] **NONE**
- [ ] **NON-PROGRAMMABLE POCKET CALCULATOR**
- [ ] **SCIENTIFIC CALCULATOR**
- [ ] **COMPUTER ANSWER SHEET**
- [ ] **GRAPH PAPER**
- [ ] **DRAWING INSTRUMENTS**

OTHER:

INSTRUCTIONS TO CANDIDATES: Answer all questions

TOTAL NUMBER OF PAGES INCLUDING COVER PAGE: 6

EXAMINER: Mr SM Marebane **FULL MARKS:** 112

MODERATOR: Mr WL Mogale **TOTAL MARKS:** 112

Question 1 [5]

Double barrel true and false statements.

Study the following two statements (i and ii) and select the correct answer from the options A to D below. Write the letter/s that correspond with your answers next to the question number.

1.1 i) Before gathering detailed information, and analyst identifies every type of stakeholder.
ii) Asking about error conditions usually is done in later interviews after the analyst understands and documents the basic processing requirements.

A The statement i is true, and ii is false
B The statement i is false, and ii is true
C Both of the statements i and ii are true
D Both of the statements i and ii are false

1.2 i) Architectural design includes the design of specific program details.
ii) During analysis, analysts build models to represent the real world and to understand the desired business processes with the information used in those processes.

A The statement i is true, and ii is false
B The statement i is false, and ii is true
C Both of the statements i and ii are true
D Both of the statements i and ii are false

1.3 i) The objective of object-oriented analysis is to identify the objects that must work together to carry out each use case.
ii) Software systems can generally be divided into three types of systems: single-user systems, enterprise-level systems, and Web-based systems.

A The statement i is true, and ii is false
B The statement i is false, and ii is true
C Both of the statements i and ii are true
D Both of the statements i and ii are false

1.4 i) Data entry controls should be excessive without being effective.
ii) Information systems that interact with customers usually receive low priority.

A The statement i is true, and ii is false
B The statement i is false, and ii is true
C Both of the statements i and ii are true
D Both of the statements i and ii are false

1.5 i) An object treats data and processes separately.
ii) Use cases cannot interact with other use cases.

A The statement i is true, and ii is false
B The statement i is false, and ii is true
C Both of the statements i and ii are true
D Both of the statements i and ii are false

Question 2 **[5]**

Multiple Choice
Identify the choice that best completes the statement or answers the question.

2.1 The P in the FURPS acronym stands for _____.
- a. Physical requirements
- b. Performance requirements
- c. People requirements
- d. Processing requirements

2.2 Managed services refers to _____
- a. Hosting company provides all the server equipment.
- b. Hosting service that provides backup and recovery services.
- c. Hosting company manages the cloud.
- d. Hosting service with maintenance of the server and system software.

2.3 A(n) ____ class acts as a switchboard between the view layer and the domain layer.
- a. boundary
- b. control
- c. entity
- d. persistent

2.4 A systems analyst conducts a(n) ____ investigation to study the systems request and recommend specific action.
- a. preliminary
- b. appendix
- c. systems
- d. transitional

2.5 In ____ prototyping, systems analysts use a prototype to verify user requirements, after which the prototype is discarded and implementation continues.
- a. system
- b. command
- c. design
- d. layout

Question 3 [5]

Complete each statement.

3.1 Persons outside an organization's control who interact with the system or who have an interest in its operation are called _____ stakeholders.

3.2 A(n) _____ class is a class that is used to retrieve data from a database.

3.3 A(n) _____ shows the object classes and relationships involved in a use case.

3.4 _____ includes the necessary measures to ensure that input data is correct, complete, and secure.

3.5 In the accompanying figure (Figure 1) showing the components of an information system, _____ describe(s) the tasks and business functions that users, managers, and IT staff members perform to achieve specific results.

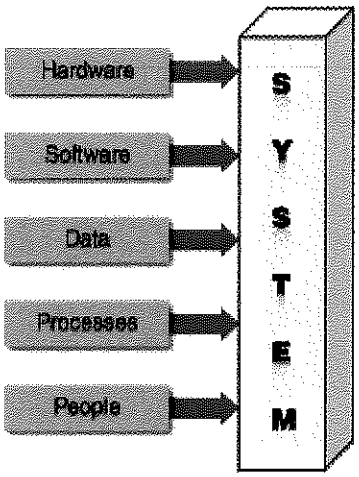


Figure 1

Question 4 [10]

4.1 Give practical examples for the each of the following types of events : (3)

(a) External event
(b) Temporal event
(c) State event

4.2 Compare/contrast aggregation with composition for a whole part relationship. (4)

4.3 Explain the purpose CRUD table to the systems analysis process. (3)

Question 5 [8]

5.1 Explain the following Object Oriented design principles:

5.1.1 Coupling (2)
5.1.2 Cohesion and separation of responsibilities. (2)

5.1.3 Navigation visibility (2)

5.2 Briefly describe the purpose of deployment diagrams (2)

Question 6 [10]

Consider the scenario of a municipality that wants to develop a software application (application) for water and electricity utility meter reading which will run on portable devices. A utility agent (agent) will be deployed to a residential area to collect meter readings data using the software application. The agent will enter the home address, utility type and current meter reading into software application in order to verify the account linked to the home address. The software application requires the agent to login before any functionality can be accessed, and the idle login session would be timed-out, which would require the agent to login again in order to continue the use of the application. Upon arrival at the office, the agent would connect the portable device to the main system in order to upload the collected meter readings data.

Develop a use case diagram for this software application. (10)

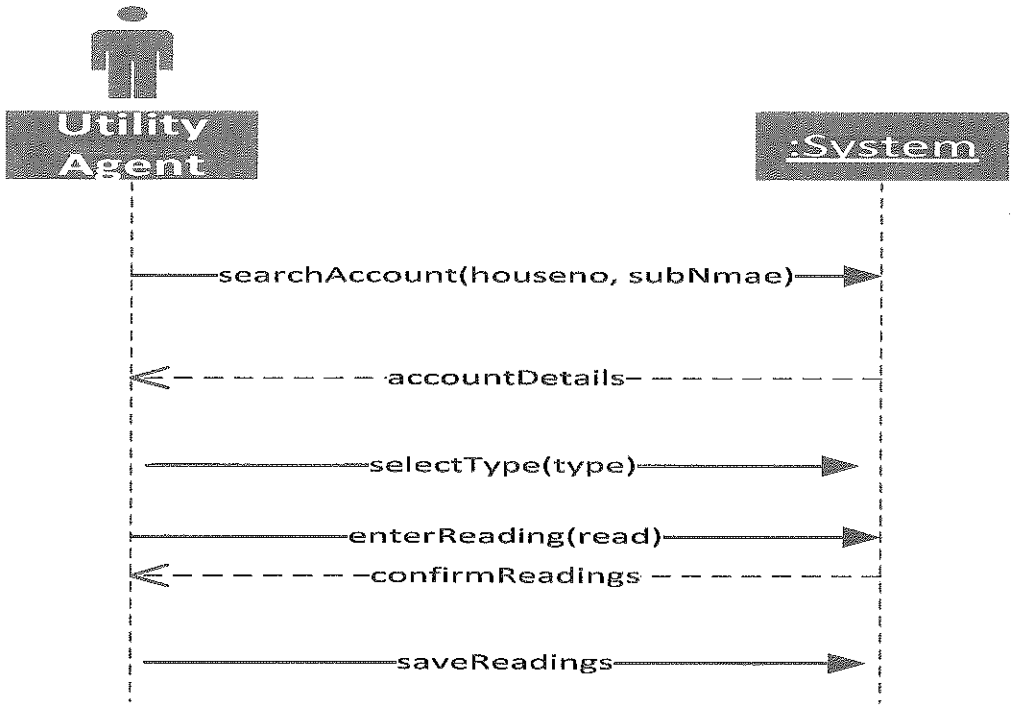
Question 7 [16]

7.1 Explain the implementation of the concept of inheritance in a domain class diagram modelling. Demonstrate the concept by means of an example. (7)

7.2 Explain the implementation of the concept of whole-part relationships in domain class diagram modelling. Demonstrate the concept by means of an example. (9)

Question 8 [41]

8.1 Consider the system sequence diagram below for the scenario that involves the capturing of meter readings as described in Question 6 and develop first cut design class diagram. (7)



8.2 Create a set of CRC cards showing classes, responsibilities, and collaborations for the use case concerned with the allocation of awards. (6)

8.3 Using three-layer design approach develop a detailed sequence diagram for the use case described above. (22)

8.4 The application is designed to be deployed on a portable device than runs a PalmOS operating system. The application will consist of an SQL Lite database, security manager and metering processor components. Develop a deployment diagram for this solution. (6)

Question 9 **[12]**

9.1 Describe two types of internally deployed software systems and give an example for each type. (4)

9.2 Explain how you identify the data fields of a system interface by using UML and the object-oriented approach? (2)

9.3 One of the challenges in systems interfaces design is the processing of inputs and outputs to external databases for EDI (Electronic Data Interchange) messages exchange which results from the difficulty of defining the format of transactions. Explain how XML can assist to resolve this challenge. (3)

9.4 Explain how a Scrum sprint works. (3)