ACCRA INSTITUTE OF TECHNOLOGY

The University of the Future

END OF TRIMESTER EXAMINATIONS
MAY 2022 TRIMESTER
DATE: SEPTEMBER 2022
COURSE CODE: CS456
COURSE TITLE: ADVANCED SYSTEM ANALYSIS & DESIGN
LECTURER'S NAME: FERDINAND HIAGBE

	COURSE OUTLINE (MAIN TOPICS)	QUESTION NO.
MajorTopic-1	Review of SAD concepts Roles and Responsibilities	Q1
MajorTopic-2	Understanding and Modeling Organizational Systems	Q5
MajorTopic-3	Approaches to Information Gathering	Q2
MajorTopic-4	Using Data Flow Diagrams	Q4
MajorTopic-5	Analyzing Systems Using Data Dictionaries	Q3
MajorTopic-6	Object-Oriented Systems Analysis and Design Using UML	Q6

PART A

FOUR QUESTIONS ANSWER THREE

Question 1

a)   QRST University College is a new university that has hired you to develop a unique school management system for them. The features and flows for this project are quite different from what schools traditionally use. As the head Systems Analyst, would you adopt a traditional Systems Analysis & Design method or an Agile Method? Compare the pros and drawbacks of each in relation to this project.

Major Topic	Blooms Designation	Score
Review of SAD concepts Roles and Responsibilities	EV	8

b)   Discuss TWO relevant information gathering methods you would use assuming you decide to go with Systems Analysis & Design method instead of the agile.

Major Topic	Blooms Designation	Score
Approaches to Information Gathering	EV	6

c) In relation to the project in Question 1a, discuss three personal yet relevant qualities that you must possess to oversee such a very unique project.

Major Topic	Blooms Designation AP	Score
Review of SAD concepts Roles and Responsibilities	AP	6

TOTAL SCORE: 20 MARKS

Question 2

a) If you were faced with a large project such as a hospital information system where you have to interview target user groups with questions, discuss TWO approaches that will be useful in your arrangement of questions.

Major Topic	Blooms Designation EV	Score
Approaches to Information Gathering	EV	8

b) Assuming your client has asked to be involved in all aspects of a system you were building as part of a Joint Application Design, discuss three potential benefits of this.

Major Topic	Blooms Designation AN	Score
Approaches to Information Gathering	AN	6

c) For Question 2b, what could be the potential drawbacks of such an approach.

Major Topic	Blooms Designation	Score
Approaches to Information Gathering	AN	6

TOTAL SCORE: 20 MARKS

Question 3

a)   In a Water Company customer complaint system, data on the complainant includes the first name, last name, telephone, and email is captured in a web form. Details of the complaint that is captured includes complainant name, date, time, category of complaint, description and optional image of the problem. One complainant can make several complaints using a either Telephone, Physical, or Email channels. Using this information, create a data structure for the COMPLAINANT MASTER and COMPLAINT data stores.

Major Topic	Blooms Designation	Score
Analyzing Systems Using Data Dictionaries		8

b)   Prepare two tables for the COMPLAINANT MASTER and COMPLAINT data stores that analyzes the Element Characteristics for Question 3a.

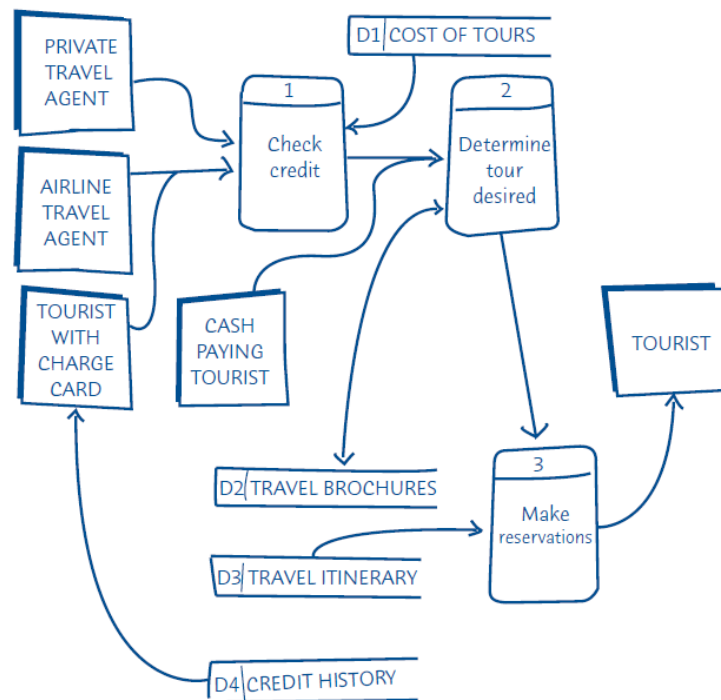| Major Topic	Blooms Designation	Score
Analyzing Systems Using Data Dictionaries		**7**

c) What validation criteria would be ideal for elements in the COMPLAINT data store of Question 3a. Prepare a table describing this.

Major Topic	Blooms Designation	Score
Analyzing Systems Using Data Dictionaries		**5**

TOTAL SCORE: 20 MARKS

Question 4

a) The figure below is a Level 1 data flow diagram of data movement in a Boti Falls tour agency called Boti's Tours. Critically examine it checking for any inaccuracies.

Major Topic	Blooms Designation	Score
Data Flow Diagrams		8

b)   Compare data flow diagrams to use cases diagrams. Discuss THREE things that data flow diagrams show that use case diagrams have a difficult time trying to explain?

Major Topic	Blooms Designation	Score

Data Flow Diagrams		6

c) With the aid of a simple example explain what "exploding" a DFD means.

Major Topic	Blooms Designation	Score
Data Flow Diagrams		6

TOTAL SCORE: 20 MARKS

PART B

TWO QUESTIONS ANSWER ALL

Question 5

a)   The Mobile Money platform in Ghana is operated by the telcos such as MTN, Vodafone and AirtelTigo. In MTN's case for instance, customers need to register for a mobile money account at any MTN office in Ghana. They can then carry out basic transactions such as transferring funds, depositing money at merchant point, withdrawing money, changing PIN, checking balance and generating mini statements. The Government of Ghana has developed an interoperability platform where moneys can be transferred from one network to the other. The Tax Processing System of the Ghana Revenue Authority has been also been integrated into the system to

process E-levy on some transactions. MTN has been able to integrate its platform with that of banks and utility providers like ECG and GWSC. Using this information provided create a context diagram assuming you were working for MTN only.

Major Topic	Blooms Designation	Score
Understanding and Modeling Organizational Systems	CR	6

b)   With the same information provided, create a use case diagram involving subscribers only and the relevant transactions they perform.

Major Topic	Blooms Designation	Score
Understanding and Modeling Organizational Systems	CR	8

c) Discuss THREE reasons why use case modeling is important in software analysis, design and development.

Major Topic	Blooms Designation	Score
Understanding and Modeling Organizational Systems	EV	6

Question 6

a)   At FH Printing Press located in Accra New Town, they use a simple software application to manage their operations. When a customer comes in for the first time, an account is created for him/her by capturing their first name, last name, telephone number and email address. This account remains same throughout the lifetime of the system. When a job is presented by the client, there is a graphic designer who doubles as an estimator to cost the job. Once the client is okay with the cost, the estimator pushes the charge to the cashier. The customer pays the amount at the cashier's end with the cashier recording the payment in the system. Once the payment is done, the job reflects at the printing section. The print attendant prints the job and indicates completion in the software. The manager generates reports on print activities at the end of the day. The manager also doubles as the System Administrator to create and manage staff accounts. All staff have unique usernames and passwords with which they log in into the system. Using this preamble, identify all possible "things" that could lend themselves into objects for which classes could be created.

Major Topic	Blooms Designation	Score
Object-Oriented Systems Analysis and Design Using UML	AN	5

b)   Using this information (Question 6a), create a simple class diagram showing objects, relationships, attributes and behaviours.

Major Topic	Blooms Designation	Score
Object-Oriented Systems Analysis and Design Using UML	CR	8

c) Create a simple Swimlane diagram showing the flow of an entire process in Question 6a.

Major Topic	Blooms Designation	Score
Object-Oriented Systems Analysis and Design Using UML	CR	7

TOTAL SCORE: 20 MARKS