PAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF SCIENCE INFORMATION TECHNOLOGY AND BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT:	**COMPUTING AND INFORMATION TECHNOLOGY**
COURSE CODE:	**BSIT 300 / BIT 300**
COURSE TITLE:	**OBJECT ORIENTED ANALYSIS AND DESIGN**
CAMPUS:	**ROYSAMBU**
EXAM DATE:	**MONDAY, 7TH AUGUST 2023**
TIME:	**2:00PM-5:00PM**

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other THREE questions in Section **B.**
- Write only your **student number** on the answer booklet provided.
- None programmable calculators permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A
(Answer ALL questions in this section)

Question 1:

a) Differentiate between Structured Analysis and Design and Object-Oriented Analysis and Design. **[2 Marks]**
b) Describe UML and the relevance of modeling in Object-Orientation. **[2 Marks]**
c) Describe any TWO views used with UML. **[2 Marks]**
d) Using examples, describe the following OOAD concepts: **[4 Marks]**
   i. Polymorphism
   ii. Encapsulation
   iii. Message passing
   iv. Data abstraction

SECTION B
(Answer any THREE (3) questions in this section)

Question 2:

a) Read the narrative below and answer the questions that follow:

A video library stocks the both DVDs and video tapes. When a potential client visits the shops, the librarian checks in the database to establish whether the client is registered or not. If the client is not registered, he/she is advised by the librarian to register with the library first before any services could be rendered. Once a client has been registered, he/she is eligible to borrow at most one library item per week. The item borrowed must be returned before any other item can be borrowed. If the client does not return the item within a month, he/she is surcharged a certain amount per day up to the time he/she returns the item.
Required:
   i. Identify the actors in the scenario above **[2 Marks]**
   ii. Draw a use case diagram to model the video library system. **[4 Marks]**
b) From the scenario described in 2a) above, draw a sequence diagram. **[4 Marks]**

Question 3:

a) Read the following narrative then answer the questions that follow:

A student is registered once his certificates have been verified to conform to the admission criteria for the university admission. After that a student is either on session, on academic leave or graduate. A student is on session once he is registered for a new semester and has paid the full fees for tat semester, otherwise on academic leave once the leave application has been granted. A graduate student is one who has successfully completed all the required course units, has passed and finished all the fee requirements.

i. Describe a state diagram **[2 Marks]**
ii. Draw a state diagram **[4 Marks]**

b) By use of a diagram, describe a Class Collaboration Card (CRC) stating its use during design. **[4 Marks]**

Question 4:

a) Using "Bank Account" as an example and in UML notation, define the following terms. **[2 Marks]**
   i. Class
   ii. Object
b) The terms "visualization" and "documentation" are some of the elements achieved via the use of UML. Explain the meaning of these two terms. **[2 Marks]**
c) Briefly explain the functions of the following physical diagrams: **[2 Marks]**
   i. Component Diagram
   ii. Deployment Diagram
d) By use a suitable example, describe the concept of multiple inheritance. **[4 Marks]**

Question 5:

a) Describe the following types of models. **[3 Marks]**
   i. Static models
   ii. Dynamic models
   iii. Behavioral models

b) Read the following narrative then draw a state diagram. **[7 Marks]**
When an order object enters the Checking state it performs the activity "check items." After the activity is completed the order object transitions to the next state based on the conditions [all items available] or [an item is not available]. If an item is not available the order is canceled. If all items are available then the order object is dispatched. When the order object transitions to the Dispatching state the activity "initiate delivery" is performed. After this activity is complete the order object transitions again to the Delivered state.

Question 6:

a) By the use of an appropriate example, describe the term overriding. **[2 Marks]**
b) Discuss the following techniques of gathering software requirements stating two advantages and two disadvantages of each. **[4 Marks]**
    i. Interview
    ii. Observation
c) Describe the generic steps in OOAD. **[4 Marks]**

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