Bachelor of Information Technology (BIT) Programme

End Semester Examination (Semester 04)

Module Name	**: Object Oriented System Development**
Module Code	**: BIT 2201**
Assessor	**: Ms. A.M.L. Chamini**
Batch	**: BIT 001**
Date	**: 2021/10/12**
Time	**: 8.00 AM to 1.00 PM – Alternative Online Assessment**

Special Instructions to the candidates:

1. The Assessment is conducted online as Alternative Assessment according to Non-State Higher Education guidelines.
2. Answer **FIVE (5)** Questions only out of **SIX (6)** Questions.
3. Illustrate your answers with clear diagrams wherever applied.
4. The paper is marked out of 100 Marks.
5. Must be submitted on or before the deadline stated.
6. Follow the General Guidelines given by the Department of Examination for exam Start time and closing time

Question 1

Object Oriented Approach is used in Software Development and this focuses on capturing the structure and behavior of a system.

a) Differentiate Object-Oriented Analysis and Object-Oriented Design providing some suitable examples. **[04 Marks]**
b) Describe the relationships you can find in the UML (Unified Modeling Language) **[06 Marks]**
c) As the final year project, you were asked to develop a software to register students at Saegis Campus. Indicate the development process you are going to use here. Describe THREE reasons for your decision. **[10 Marks]**

[Total = 20 Marks]

Question 2

A University management system holds the details of every student, lecturers and courses available in the university. Basic responsibilities of this system are to register the students, assign the students and lecturers to the courses. The student registration is handled by the cashier at the main desk, and after the student registration, the student must receive a receipt and admission documents. A student can do the payments using Cards or Cash. When registering to a course, a student can register online or in-person and this is handled by the clerk. When the registration is completed, each student must be provided with the student number and time-schedule of the lectures. Assigning of the lecturers is done by the course coordinator.

a) Inheritance and polymorphism can be seen between the use cases of a Use Case Diagram. List and describe the notations that can used to indicate the above ideas. **[04 Marks]**
b) Identify the actors for the above University management system. **[06 Marks]**
c) Draw a use case diagram for the University Management System. **[10 marks]**

[Total = 20 Marks]

Question 3

Class Diagrams are used to define the objects and object classes of a system. This is a static picture of the objects/classes.

a) Identify the difference between the Conceptual Class Diagram and Design Class Diagram. **[04 Marks]**
b) For online food ordering system, identify the boundary classes, control classes and entity classes. **[06 Marks]**
c) Draw a conceptual class diagram for the online food ordering system. **[10 Marks]**

[Total = 20 Marks]

Question 4

Object Sequence Diagrams are used to show the dynamic behavior of a system.

a) Indicate the definition for the OSD (Object Sequence Diagrams) **[04 Marks]**
b) To indicate the method calling, messages are sent between the objects. Identify the main three parts of a Message Syntax. **[06 Marks]**
c) When a customer needs to withdraw some money from the ATM machine, at first, the customer needs to insert the card and enter the PIN. The card and the PIN are validated by the bank. If the card is valid, user will allow to enter the PIN and otherwise the card will be Ejected. The customer will allow to do the transactions if the entered PIN is valid, otherwise the card gets automatically blocked. Draw an Object Sequence Diagram for this ATM validation. **[10 Marks]**

[Total = 20 Marks]

Question 5

Dynamic Models in UML are able to catch the changes on objects and their relationships overtime. State Transition diagrams mainly focused on the changes of the states of an object.

a) Identify and briefly describe the event types in State Transition Diagrams.

[04 Marks]

b) Figure 1.1 Shows the use case diagram for the human life. Refer to the figure to answer the questions i. and ii.

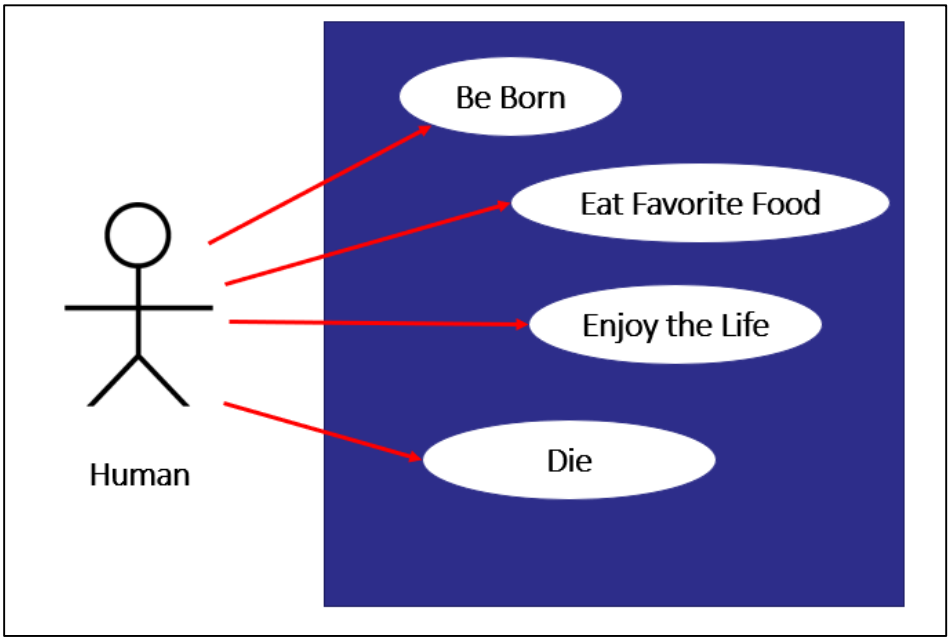

Figure 1.1: Use Case Diagram

i. Identify the states of a human by referring to the figure 1.1.

[06 Marks]

ii. Draw a complete State Transition Diagram for the use case diagram in figure 1.1 **[10 Marks]**

[Total = 20 Marks]

Question 6

Activity Diagrams are the graphical representations of how data move around an information system.

a) List and briefly describe the THREE types of activity nodes. **[04 Marks]**

b) Explain how to Exception Handling happens in an Activity Diagram. **[06 Marks]**

c) Draw an activity diagram for the given scenario.

A customer goes to the bank to withdraw some money. The cashier will hand over the money if the account balance is sufficient. Otherwise, the customer will go to the ATM machine and withdraw money from her other bank account. After the customer gets money, she will go to the grocery store to purchase some household items. **[10 Marks]**

[Total = 20 Marks]

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