



# SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

## Higher National Diploma in Information Technology

Second year, First Semester Examination – 2017

HNDIT2313 Object Oriented Analysis and Design

Instructions for Candidates:

No. of questions : 6

Answer only five (5) questions

No. of pages : 3

Time : 3 hours

### Question 01

- (i) What is meant by UML and what are the two types of diagrams available in UML? (04 marks)
  - (ii) Give examples for the two types of diagrams mentioned in above (i). (04 marks)
  - (iii) Briefly describe what is an object in the context of object oriented programming (04 marks)
  - (iv) Mention two object oriented programming languages (02 marks)
  - (v) Mention three advantages in using object oriented analysis and design in system development (06 marks)
- (Total 20 marks)**

### Question 02

- (i) What is meant by Access Specifiers in object oriented software development? (02 marks)
  - (ii) Name and explain two access specifiers used in C++ (04 marks)
  - (iii) Briefly explain , what is a parameterized constructor in C++ programming (04 marks)
  - (iv) Write the C++ code to implement the constructor of **Tyre** class which initializes the following private data members. (06 marks)
    - a. **Radius**
    - b. **Brand Name**
  - (v) What is meant by Destructor in C++ programming (02 marks)
  - (vi) Mention how C++ implement data abstraction (02 marks)
- (Total 20 marks)**

### **Question 03**

- (i) Give the object oriented terminology for each of the following object oriented features. (05 marks)
- A blueprint for an object which defines all the data items contained in the object and the operations that are permitted for the data
  - A representation of something within the domain that the program models which contains values of data and which implements operations on that data
  - An operation which will manipulate the data contained in an object
  - A variable which holds data that describes an individual object
  - A variable which holds data that is relevant to all the objects created from the same template
- (ii) Explain the deference between static modeling and dynamic modeling (02 marks)
- (iii) Briefly explain what is a component diagram (04 marks)
- (iv) What is the deference between provided interface and required interface in component diagrams (02 marks)
- (v) Draw a component diagram to illustrate the following requirement (07 marks)  
In a point of sales system, the software module **Customer Invoice** requires the **Item details** from the software module **Item**.

**(Total 20 marks)**

### **Question 04**

- (i) Briefly explain what is a use case diagram in UML? (02 marks)
- (ii) Briefly explain following components in a use case model. (03 marks)
- Use case
  - Boundary
  - Extend
- (iii) What is the deference between Primary actor and Secondary actor in a use case diagram (02 marks)
- (iv) Draw the use case diagram for the following scenario (13 marks)
- A bank performs create account, deposit and withdrawal as the main transactions with its customers. Performing deposit and withdrawal is not possible without a created account. Withdrawal can be performed in either in a counter or ATM machine. While a withdrawal is performing in counter the pass book is definitely updated. While a withdrawal is performing in an ATM, the user is definitely validated.

**(Total 20 marks)**

### **Question 05**

- (i) Briefly explain what is meant by a class diagram in object oriented analysis and design, and what are the information can be included in it. (02 marks)
- (ii) Study the given scenario for a bank and answer the given questions.
- Bank has large number of accounts and customers. Customer can have any number of accounts
- Assume **custId**, **custoName** are private data of the customer and **PrintCusDetail** is a public method of the customer. Draw the class diagram to illustrate design specifications for the bank. (09 marks)
  - Assume the accounts can be divided in to two groups, as saving account and fixed account. Each savings account is created with a serial number starting ‘s’, and Each Fixed account is created with a serial number starting ‘F’ Draw an object diagram to illustrate the above given specifications for the bank. (05 mark)
  - Write the C++ code to create savings account class, which is a sub class of account class (04 marks)
- (Total 20 marks)**

### **Question 06**

- Briefly explain what is an activity diagram is in UML (03 marks)
- Mention three symbols used in activity diagrams (03 marks)
- Briefly describe what is swim lane in activity diagrams (02 marks)
- Draw an activity diagram for the following scenario related to cash withdrawal in a bank.

Customer fill the double slip voucher and produce to bank assistant with his identity card and pass book. If customer failed to produce all the documents bank assistant refuse the transaction.

Bank assistant validate customer identity and account. Tally the requested withdrawal amount with account balance. If the withdrawal is possible the documents are produce to senior officer for approval.

Senior officer check the documents. If the documents are ok then payment is approved return the document to bank assistant. Else disapprove the withdrawal and return the document to bank assistant

If the transaction is approved bank assistant enter the transaction data to computer system, print pass book and issue the cash. Else return the documents to customer.

(12 marks)

**(Total 20 marks)**