



# 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

First Year, Second Semester Examination – 2022

### HNDIT 2022 -Software Development

Instructions for candidates:

Answer **five** questions **only**.

All questions carry equal marks.

No. of questions : 06

No. of pages : 03

Time : 03 hours

#### Question 01

[Total marks 20]

- i. Define “computer program”. (03 Marks)
- ii. Name three types of software other than ‘system software’. (03 Marks)
- iii. Fill in the blanks using the most suitable word from the given list of words. (04 Marks)  
(Data structures, Syntax, Flow control Structures, Variables)
  - a. \_\_\_\_\_ are containers for storing data values, a memory location for a data type.
  - b. \_\_\_\_\_ refers to the set of rules that define the structure of a language.
  - c. \_\_\_\_\_ are a collection of data values. These structures include operations that can be applied to that data.
  - d. \_\_\_\_\_ are the fundamental components of computer programs. They are commands that allow a program to “decide” to take one direction or another.
- iv. Briefly explain what is an IDE (Integrated Development Environment), and state two famous IDEs. (04 Marks)
- v. Write an algorithm to calculate the average of the numbers in the list. (06 Marks)

#### Question 02

[Total marks 20]

- i. Name three development techniques. (03 marks)
- ii. What is Software Development Life Cycle (SDLC)? (03 marks)
- iii. Briefly explain any four stages of SDLC. (04 marks)
- iv. Identify which SDLC model is described in each of the following descriptions. (04 marks)
  - a. \_\_\_\_\_ model is a continuous software development model in which development is seen as flowing steadily downwards through the steps of requirements analysis, design, implementation, testing (validation), integration, and maintenance.
  - b. \_\_\_\_\_ is a practice which promotes continuous interaction of development and testing during the SDLC process of any project. In this method, the entire project is

divided into 'small incremental builds. All of these builds provide iterations, and each iteration lasts from one to three weeks.

- v. Explain the three types of manual software testing..

(06 marks)

**Question 03**

**[Total marks 20]**

- i. Define the term 'Linear Data Structure' (03 marks)
- ii. State three Linear Data structures. (03 marks)
- iii. What is the difference between Static and Dynamic data structures? Give an example for each. (04 marks)
- iv. Write an algorithm for insertion operation of an array. (04 marks)
- v. Briefly explain any three (03) operations of each of the following data structures. (06 marks)
  - a. Stack
  - b. Queue

**Question 04**

**[Total marks 20]**

- i. What is 'product documentation'? (03 marks)
- ii. There are five important areas that should be documented for a formal release of a software application. State three of them. (03 marks)
- iii. Define the term 'software quality', and mention two attributes of software quality. (04 marks)
- iv. What is meant by 'best case efficiency' and 'worst case efficiency' in an algorithm? (04 marks)
- v. Arrange the list shown below in ascending order using insertion sort algorithm. (it is required to show the steps or passes). (06 marks)  
12, 11, 13, 5, 6

**Question 05**

**[Total marks 20]**

- i. What is 'system software'? (03 marks)
- ii. What are the differences between 'compiler' and 'interpreter'? (03 marks)
- iii. Briefly describe the use of (04 marks)
  - a. Device drivers
  - b. Firmware
- iv. Following is a linear search algorithm used to find the value 'x' in an array. Fill in the blanks with correct terms (04 marks)

Linear Search (Array A, Value x)

Step 1: Set i to 1

Step 2: \_\_\_\_\_ then go to step 7

Step 3: \_\_\_\_\_ then go to step 6

Step 4: Set i to i + 1

Step 5: Go to Step 2

Step 6: Print Element x Found at index i and go to step 8

Step 7: Print element not found

Step 8: Exit

- v. Read the following case study and answer the question. (06 marks)

A local school has installed a vending machine that dispenses beverages. The vending machine offers a selection of drinks including water, soda, juice, and tea. Each beverage has a specific button that students can press to select their desired drink. The vending machine needs a simple algorithm to dispense the selected beverage and update the inventory.

A student wants to get a drink from the vending machine. They press the button corresponding to their desired beverage. The vending machine needs to check the inventory and dispense the beverage if it is available.

**Question:**

Based on the scenario above, write an algorithm that describes the process of selecting and dispensing a beverage from the vending machine.

**Question 06**

Write short notes on the following topics.

**[04 x 5= Total 20 marks]**

- |                           |            |
|---------------------------|------------|
| i. Prototype model        | (04 marks) |
| ii. Test case             | (04 marks) |
| iii. Public clouds        | (04 marks) |
| iv. Software as a service | (04 marks) |
| v. Sub programs           | (04 marks) |