BIT No: sets-02

SLIIT Computing (Pvt) Ltd.

Bachelor of Information Technology

Final Examination
Year 1, Semester 1, 2006
Thursday, 17th May 2006

Programming Techniques and Practices (N101)

Duration: 3 Hours
(Time **9.00 a.m. – 12.00 noon.**)

Instructions to Candidates

- This paper contains **FIVE (5)** questions on **FOUR (4)** Pages.
- Answer **ALL** questions in the **WORKBOOK** provided.
- The entire exam is worth 100 points. The point value of each question is given.

FINAL EXAMINATION
Semester 1,2006

PROGRAMMING TECHNIQUES AND PRACTICES

Question 1
20 marks
36 minutes

1. Distinguish between syntax errors and logical errors.**(2 marks)**
2. What are the main functions of a compiler? **(2 marks)**
3. List 3 considerations which are present in assembly language but not in high level language **(3 marks)**
4. Distinguish between compilers and interpreters.**(2 marks)**
5. Name four advantages of high level languages.**(2 marks)**
6. Name two Object Oriented Languages.**(1 mark)**
7. What is "Multiplicity" ?**(2 marks)**
8. Write three main properties of an object what you can identify with Object Oriented programming ?**(2 marks)**
9. A simple payroll program must read the name of an employer (terminal input). If the name <> 'END' then it must read the number of hours worked and the rate per hour. It must then calculate the total pay and print the name and the total pay. This is repeated until the name read is "END".

    i. What is the purpose of the name "END"? **(2 marks)**
    ii. Use a while construct to implement the above description. **(2marks)**

Question 2
20 marks
36 minutes

1. Write down the main steps of software development .**(3 marks)**
2. Why it is so important to have documentation with computer software ?**(3 marks)**
3. Write tree advantages of structured programming. **(3 marks)**
4. Read the below scenario. **(5 marks)**
   Super market Automation software
   Super market Automation software(SAS).The manage of super markets wants to have an automation software. The super market stock a set of items. Customers picks the items from different counters in required quantities. The customers present these items to the sales clerk.The sales clerk enters the relevant data such as code number of items, quantities and etc.; The SAS , at the end of the transaction , prints the bill with relevant information. The SAS maintain the inventory details of the various items. Also SAS should support printing the sales statistics for every item the supermarket.

Use top down approach and try to design the requirements.

5. Consider a Bank. What are the functionalities, uses would like to have for their computer software ?**(3 marks)**
6. Listed below are some sample programs. Desk check the program using the test data given. **(3 marks)**

(i) Initialise X to 0 — Test Data : 102, 99, 100

```
Add 5 to X
IF (X> 100)
      Display X
ELSE IF (X<100)
      Display X + 100
End If
Stop
```

Write down the output for the test data given.

Question 3
20 marks
36 minutes

1. "Testing is very important with computer software". Comment on this statement.**(2 marks)**
2. Write down the six basic computer operations. (2 marks)
3. Briefly explain.**(6 marks)**
   i. JSP Structure Chats
   ii. Decision trees
   iii. Decision tables
4. The members of the technical board of a small university are considering voting for a pay increase for their 25 faculty members. They are considering a pay increase of 8%. However, before doing so they want to know how much the pay increase will cost. Design an algorithm that will prompt for and accept the current salary for each technical faculty member, then calculate and display their individual pay increases. At the end of the program print the total faculty payroll before and after pay increase and the total pay increase for all employees.
   For each employee salary is stored in the database and retrieving that to variable called emp_salary.
   Note: Database access is necessary.
   Draw the IPO chart for above scenario.**(5 marks)**

5. Write an algorithm to input the temperature in Fahrenheit. The program should do the following. **(5 marks)**
   Display a screen to input the temperature in Fahrenheit
   End the program when '0' Fahrenheit is entered.
   Calculate and display the temperature in Celsius.
   Using the formula $C = 5*(F-32)/9$

Question 4
20 marks
36 minutes

1. List 3 sorting methods and explain the process. **(3 mark)**
2. Name the two Searching Techniques. **(2 marks)**
3. Which sorting method is the most effective sorting method when sorting small set of data items? **(1 mark)**
4. Briefly explain about (i) Two dimensional Arrays (ii) Linked lists **(4 marks)**
5. Write a pseudocode that writes the marks stored in the file to load in to the array in reverse order. The number of 50 number of records.**(5 marks)**

6. Using test data of 20, 310, 67, 45, 263, and 23 provide a table showing the elements of the array during the processing of following sorting algorithm shown below. **(5 marks)**
   Assume that n is the size of the array.

```
FOR pass =1 to (n-1) DO
        SET count to pass + 1
        SET lowest to pass
                FOR count = (pass+1) to n
                        IF numbers [count]>numbers [lowest] THEN
                                lowest:= count
                        ENDIF
                Next count
        SET temp to numbers[pass]
        SET numbers[pass] to numbers[lowest]
        SET numbers[lowest] to temp
Next pass
```

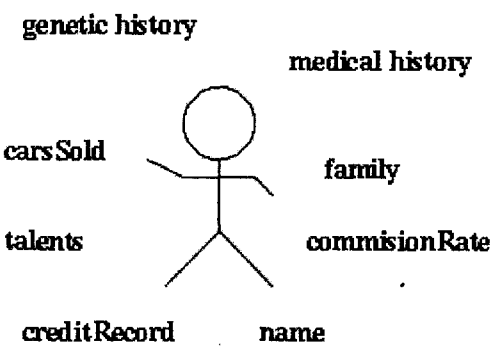
Array Element	Initial state	After 1st pass	After 2nd pass	After 3rd pass	After 4th pass	After 5th pass
1	20					
2	310					
3	67					
4	45					
5	263					
6	23					

Question 5
20 marks
36 minutes

1. Explain in brief the three main principles of the Object- Oriented design Approach. **(3 marks)**

2. An information system can be considered as a collection of collaborating objects. Identify possible objects in a SLIIT Student Information System
   - **i.** What an Object? **(2 mark)**
   - ii. Name five (5) objects. **(2 marks)**
   - iii. How do the objects collaborate? **(1 mark)**
   - **iv.** What is a class? **(2 mark)**

3. Consider the person and define possible abstractions for the systems given below. **(4 marks)**



real world

1. A Sales tracking system
2. A Medical practitioner

4. Library System
   The Library system is used by the students and staff. The Library contains Books, Journals and Magazines. The Books can be categorized in to Published books and Text Books. Magazines can be categorized to Weekly Magazines and Monthly Magazines. Books and Magazines can be issued to both Students and Staff. Journals can only be issued to the Staff. Issuing and receiving Books are done by the Librarian. Two categories of students called Part time students and Full time students. **(6 marks)**

   i. Read the above statement carefully and identify the objects that are required to model the above statement.
   ii. Identify the relationships, which are present between these objects.