



**RAJARATA UNIVERSITY OF SRI LANKA  
FACULTY OF APPLIED SCIENCES**

**B.Sc. (General) Degree in Applied Sciences  
First Year – First Semester Examination – September/October 2019**

**COM 1201 – Principles of Program Design  
(Theory Paper)**

**Time: Two (02) hour**

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**Answer ALL the questions.**

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01.

- a. What is an algorithm? **(03 marks)**
- b. What is a flow chart? Briefly discuss four (04) advantages of using a flow chart.  
**(12 marks)**
- c. Write an algorithm to show the process of logging in to your Gmail account. Note that the users are not allowed to enter an incorrect password or an email address more than three times.

**(10 marks)**

02.

- a. What is a variable? Identify suitable data types to store each of the following data
  - Age of a student.
  - Exchange rate of US dollar
  - Name of a person
  - Output of a truth table

**(06 marks)**

- b. Explain the use of pseudo code? **(02 marks)**
- c. What are the three types of control structures used in programming? **(03 marks)**
- d. Write a pseudo code for a program that repeatedly asks the user to input a whole number in the range 1 to 100 until an invalid number is entered. **(04 marks)**
- e. Draw a flowchart and write the pseudocode to find the Fibonacci series till  $\text{term} \leq 1000$  **(10 marks)**

03.

- a. Write an algorithm to check whether a character entered by the user is a vowel or a consonant **(05 marks)**
- b. Draw a flow chart to check whether a given number is a prime. Using the same concept draw a flow chart to find the first 100 prime numbers. **(10 marks)**
- c. Write a pseudocode to generate a Fibonacci triangle. In your program, you have to get an input from the user for the limit for fibonacci triangle, and printing the fibonacci series for the given number of times (limit). An example output is given below **(10 marks)**

Enter the limit:9

```

1
1 1
1 1 2
1 1 2 3
1 1 2 3 5
1 1 2 3 5 8
1 1 2 3 5 8 13
1 1 2 3 5 8 13 21
1 1 2 3 5 8 13 21 34

```

Enter the limit:5

```

1
1 1
1 1 2
1 1 2 3
1 1 2 3 5

```

04.

- a. What is a programming paradigm? State and discuss two main categories of programming paradigms. **(07 marks)**
- b. What are the differences between procedural and object oriented programming **(06 marks)**
- c. What is the major concern in mathematical programming? **(04 marks)**
- d. Following is a knowledge base defined in Prolog:  
 happy(Vincent).  
 listens2Music(Butch).  
 happy(Butch)  
 happy (Yolanda)  
 playsAirGuitar(Vincent):- listens2Music(Vincent), happy(Vincent).  
 playsAirGuitar(butch):- happy(butch).  
 dance(yolanda):- happy(yolanda), plyasAirGuitar(Butch)

What would be the Prolog answers for the following queries? Explain your answer.

- ?- dance(Yolanda)
- ?- playsAirGuitar(Vincent)
- ?- playsAirGuitar(Butch)
- ?-listen2Music(Yolanda)

**(08 marks)**

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