RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences
First Year - Semester II Examination – Oct/Nov 2017

COM 1305 – OBJECT ORENTED PROGRAMMING

Time: Three (03) hours

Answer all the questions

1.

a) List three levels of programming languages. (03 marks)

b) Object and class are the building blocks of object oriented paradigm. Explain with examples how they differ from each other. (06 marks)

c) Define the following terms.
   i. Abstraction
   ii. Encapsulation (06 marks)

d) Write simple Java code segments to perform the following tasks.
Note: Complete java program is not needed.
   i. Write a "while" loop that corresponds to the following "for" statement. (05 marks)

```
for(int i=0, j=5; i<5, j>0; i++,j- -){
        System.out.println(  i+j)  }
```

   ii. Write "do while" loop that corresponds to the following "while " loop. (05 marks)

```
int i=0;
    while(++i<10){
        System.out.print (I + "*"); }
```

[Total 25 marks]

2.

a) List the benefits of object oriented programming. (04 marks)

b) What is meant by polymorphism in OOP? Explain how you could achieve polymorphism in Java. (05 marks)

c) What are Generalization and Specialization with respect to inheritance? Explain using an example. (06 marks)

d) In object oriented programming, uses inheritance to model two or more entities that are similar but different.

i. What are the different forms in inheritance? (02 marks)

ii. Write the class structure forthe given scenario. (08 marks)

Student class has five common features such as ***name, registration status, course, subject discipline*** and ***GPA***. Also have two common operations such as ***course registration*** and ***exam registration***. According to the available subject disciplines two sub classes can be clearly identified*as* ***Physical Science students*** and ***ICT students***, which are derived from Student super class. ICT student has a specific feature called ***number of month assign for industry training period*** and a specific operation called ***selection criteria*** for the training. Physical Science students have own feature called ***number of field activities*** and the***field activity evaluation*** method.

[Total 25 marks]

3. Java program run by sequentially executing a series of instructions.

a) Describe the process of executinga java program briefly. (04 marks)

b) Based on life time, differentiate variables in object oriented programming. (03 marks)

c) Consider the following sample code;

```
public class Student
{
   public static void main(String[ ]  args)
   {
        System.out.print("Student Name");
   }
}
```

i. Technically explain **public,static,void** and **main(String[ ] args).** (04 marks)

ii. Differentiate **print()** and**println().** (02 marks)

d) Explain what the advantages of arranging classes in to packages are. (06 marks)

e) Compare and contrast strength of the access modifiers. (06 marks)

[Total 25 marks]

4. Unified modeling language (UML) is a general purpose visual modeling language that is used to specify, visualize, construct and document the artifacts of a software system.

a) Define the term "Model" in UML. (02 marks)

b) What are the three main building blocks in UML? (03 marks)

c) Compare and contrast two modeling views. (04 marks)

d) List Rational Unified Process's (RUP) best practices. (04 marks)

e) An automated teller machine provides bank customers with access to financial transactions in a public space. Customer uses bank ATM to check balance of their accounts. They deposit funds, withdraw cash and transfer funds. Technicians provide maintenance and repairs.
Defining suitable actors and use cases draw a use case diagram for the above scenario. (12 marks)

[Total 25 marks]

5.

a) What is meant by the term "interface"? (03 marks)

b) Explain how to implement an interface in a class. (06 marks)

c) "One interface cannot implement another interface." Justify this statement. (07 marks)

d) Write short notes on following keywords in Java

i. "this" (03 marks)

ii. "super" (03 marks)

iii. "implements" (03 marks)

[Total 25 marks]

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