Rajarata University of Sri Lanka
Faculty of Applied Sciences

Bachelor of Science (General) Degree
Year II Semester II Examination – April/ May 2015

COM 2302 – OBJECT ORIENTED PROGRAMMING

Answer all questions. Allocated time: three (3) hours.

1.

a) The object is an important factor in Object Oriented programming paradigm. Describe what is an object? *(02 marks)*

b) What are the object oriented components can be found in a class? Discuss with a suitable example. *(04 marks)*

c) Review the statement "A class can survive without an object. However an object couldn`t stand alone without a class." *(04 marks)*

d) Explain "`java.lang.object`" library class. *(06 marks)*

e) Method overloading can lead to fast programming than method overriding. Do you agree with this statement? Justify your answer. *(09 marks)*

(25 marks)

2. Following figure is a code (statement) of a java program.

```
private class Student extends Person implements Department{
```

a. Explain the above statement. *(07 marks)*

b. What will happen if this code compiled? Justify your answer. *(04 marks)*

c. Describe "Polymorphism" using suitable examples. *(05 marks)*

d. Use the java program given in the following figure to answer the questions given after the figure.

```
1. class Person {
2. Person(int x ) {
3. System.out.println("Z");
4. }
5. Person() {
6. this(10);
7. System.out.println("X");
8. }}
9. class Student extends Person{
10.Student ( String y ){
11.System.out.println("Y");
12.}
13.Student( int a ){
14.super (100);
15.System.out.println("W");
16.}
17.public static void main ( String args [] ){
18.Student std1 = new Student("X");
19.}}
```

i. What will be the compiling order of this simple java program? *(02 marks)*

ii. If this program is error free, what will be the output? *(03 marks)*

iii. What will happen if the 18th statement of this program is replaced by the following? *(04 marks)*

```
Student std1 = new Student(1.5);
```

(25 marks)

3. "Easy Tours" is a vehicle renting company. It supplies cars, vans, buses and lorries to the customers on a rental basis. The company intends developing a computer system that allows users to rent a vehicle through the Internet. The company specifies its requirements as follows.

The system allows renting a vehicle to a customer on demand. A customer can select a vehicle based on what the system displays as available vehicles. If there is any exceptional situation a customer can cancel the renting of the vehicle before the order fulfillment time. In order to access all the functionalities of the system customer needs to log into the system. If a customer is a new user then the system needs to register the customer into the system. During the registration process the customer needs to fill an online registration form with personal information and pay a refundable registration fee. The registration fee can be paid using a credit card. At the end of a successful registration process, the system creates a user account with a username and a password for each customer. A customer needs to log into the system to access all the functionalities.

A non registered customer also can check available vehicles in the system and he/she can rent a vehicle, however, the priority will be given for registered customers.

The system informs about the involvement of customers with the system to the system administrator via system logs. The system administrator maintains all system login records and submits them to the manager at the end of the day. Resource manager is responsible for arranging the vehicles as per customer demands and he updates the available vehicles list into the system.

a) Draw the use-case diagram for the company online system. *(15 marks)*

b) Write down the **pre conditions**, **post conditions** and **events description** for each use-case. *(20 marks)*

(35 marks)

4.

a) Identify suitable classes for the system given in question number three (03). *(3 marks)*

b) Propose a class diagram with corresponding class relationships. *(5 marks)*

c) Suggest a proper sequence diagram for "Log in" use case. *(7 marks)*

(15 marks)

(Total 100 marks)

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