RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences
First Year- Semester II Examination – November/December 2016

COM 1306 – JAVA PROGRAMMING LANGUAGE

Time: Three (03) hours

Answer all questions.

01.

a. **"Java is a platform independent language".** Do you agree with this statement? Explain your answer with a suitable example. (06 marks)

b. Read the following program code carefully and rewrite it with the appropriate corrections. State the reasons for your decisions. (05 marks)

```
int m1,m2,m3, avg;
m1=45;
8m2=36;
m3=89
avg = (m1+8m2+m3)/3;
if (avg>=75)
System.out.println("First division student");
else
{ if (avg >= 55)
        System.out.println("Second division student");
        System.out.println("Great");
        else
        {if (avg>=40);
                System.out.println ("General pass student");
                else
                System.out.println("Fail student");}}
```

c. A student has decided to use the following identifiers to name four variables in a Java program.

Variable names: %company, $_month, _postalCode, continue

Give your comments on each ofhis decisions. (02 marks)

d. Consider the following code extracted from a Java program. Write the output of the program. (04 marks)

```
int x = 5;
int y = 2;
int z = -4;

System.out.println(x++);

System.out.println(++y);

System.out.println(z+=2);
```

e. Suppose you need to write a program which dispalys the words "ONE", "TWO",... , "NINE", or "OTHER" if the integer variable "number" is either 1, 2,... , 9, or any other value respectively. Write two Java programs called **PrintNumberInWord1** and **PrintNumberInWord2** using:

i. a "nested-if" statement;
ii. a "switch-case" statement. (08 marks)

(Total: 25 marks)

02.

a. Write a function called **Fibonacci** to display the first 20 Fibonacci numbers F(n), where F(n)=F(n–1)+F(n–2) and F(1)=F(2)=1. Also compute their average. The output shall look like:

The first 20 Fibonacci numbers are:
1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765
The average is 885.5 (08 marks)

b. Following code segment is extracted from a Java program which prints a variable value. State what will be the output of the program? Explain the reason by stating the difference between explicit and implicit type casting. (04 marks)

```
double x = 10.5;
int y = (int) x;

System.out.println(y);
```

c. State the difference between indexOf(element), lastIndexOf(element) methods in Java with an example. (03 marks)

d. Consider the following program. State what will be the output of it? Explain the reasons. (02 marks)

```
float I = 3.5;
Void printNumber()
  {
  float I = 4;
  System.out.println(I);
  }
```

e. Compare and contrast ***Do While*** and ***While Do*** statements. (03 marks)

(Total: 20 marks)

03.

a. **"We can't instantiate interfaces in Java".** Do you agree with this statement? Explain by distinguishing between class and an interface. (04 marks)

b. Following program code is extracted from a Java program. If you run this program, what can you see as the output? Explain the reason for your answer. (04 marks)

```
Interface Try{
      int x = 10;
      }
      Class sample implements Try{
              Public static void main(string args[])
              {
                      x= 20;
                      System.out.println(x);
              }
      }
```

c. Explain why exception handling is important in Java? (03 marks)

d. Explain with 2 examples what are the 2 ways a Java exception objects can be created and distinguish between them. (04 marks)

e. State the difference between a Java applet and a normal Java application. (04 marks)

f. What are the important functions needed to create a Java applet? Briefly explain each function. (06 marks)

(Total: 25 marks)

04.

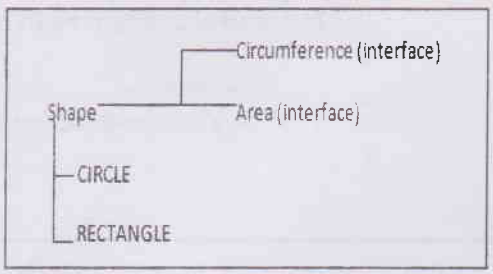
a. Java programming language follows Object Oriented Programming style. Explain what are the advantages you can obtain with this styleother than the other programming paradigms. (04 marks)

b. A class called Account which models a bank account is designed as shown in the class diagram. Account contains an account number and a balance which specifies the current balance of the account. credit() and debit() are the methods which add and subtract the given amount from balance respectively. The debit() method should print the message "amount withdrawn exceeds the current balance" if the amount is more than the balance. The method printReceipt() should return "A/C no : xxxx Balance xxx.xx. (eg : "A/C no : 1234 Balance : Rs.1000.00) with balance rounded to two decimal places. Follow the diagramgiven below to create the Account class with the necessary adjustments. (08 marks)

Account
-accountNumber : int -balance : double = 0.0
+Account(accountNumber : int) +credit(amount : double) : void +debit(amount : double) : void + printReceipt() : String

c. **"Accessibility of the protected access modifier is higher than the private access modifier".** Do you agree with this statement? Explain by mentioning the situations where you can access the class members defined with these modifiers. (05 marks)

d. Consider the following hierarchy. Implement the hierarchy with the details given.



Circumference and Area are 2 interfaces which consist of getCircumference() and getArea() methods. Shape is the class which is inherited from the 2 interfaces. Another 2 classes are inherited from the shape class where the both classes implement the interface methods within the class itself. (08 marks)

e. We can use method overloading and method overriding to implement the polymorphism. Differentiate between the 2 terms and state how you can apply them in polymorphism. (05 marks)

(Total: 30 marks)

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