

UNIVERSITY OF RUHUNA

BACHELOR OF COMPUTER SCIENCE (GENERAL) DEGREE LEVEL II
(SEMESTER I)
EXAMINATION – AUGUST 2017

SUBJECT : COMPUTER SCIENCE
COURSE UNIT: CSC 2123(Object Oriented Programming)

TIME: 2 hours

Answer all four (04) question.

1.

a. Write one difference between **Object Oriented Programming Languages** and **Procedural Programming Languages**.

b.

i. Explain the purpose of using “*new*” keyword in Java with an appropriate example.

ii. Write the main difference between *class variables* and *instance variables* in Java class.

c. Write Java methods for each of the following tasks.

i. To pass a decimal number as a parameter and return the integer part of that decimal number.

ii. To pass an integer number as a parameter and return the reverse value of that integer number. (Ex. Input: 5426 output: 6245).

d. A tourism management system in a private organization requires a class called **Tourist**. Each tourist has a *tourist identity number*, *native country* and *duration of the stay* in the country. The *guide fee* per day, Rs.2000 which is same for every tourist, should also be recorded.

- When a Tourist object is created, the *identity number*, *native country* and *duration of the stay* should be set.

- A method to calculate total guide fee which is,

$$\text{Total guide fee} = \text{guide fee per day} * \text{duration of stay}$$

should be implemented.

i. Write the declaration of the class **Tourist** in Java. Include all the appropriate fields, methods and constructors required according to the above description.

ii. Write a separate class to test Tourist class with the following objects given in the table 1.

Object	Identity number	Country	Duration
tourist1	3112	Sweden	5
tourist2	4532	France	4

Table 1

iii. Write a Java code segment to display the total guide fee for each tourist.

2.

- a.
- i. Write two benefits of using “**Encapsulation**” concept in a Java program.
 - ii. Explain the method of making an attribute of a Java class as read-only or write-only, outside the class scope.

b. Explain the term downcasting using a java example.

c. Consider the following two methods,

```
int total(int arg1, int arg2, double arg3){.....}
```

```
double total(int arg1, int arg2, double arg3){.....}
```

Is this a valid example for method overloading? Explain your answer

d. Consider the following **Payment** class and write necessary java code segments for the following questions i, ii, & iii.

```
class Payment{
    private double amount;
    public Payment(double amount){
        this.amount=amount;
    }
    public double getAmount(){
        return amount;
    }
    public void setAmount(double amount){
        this.amount=amount;
    }
    public void calcTax(double percentage){
        System.out.println("Total taxvalue"+amount*percentage);
    }
}
```

- i. Write the declaration of **CreditCardPayment** class which is a subclass of **Payment** super class.
- ii. Write the Java code segment for constructor method of **CreditCardPayment** class by invoking super class constructor.
- iii. In the **CreditCardPayment** class Tax value will be calculated only for the payments which are not paid by the due date. In this method delayed payment amount will be multiply by the given percentage. Assume, the delayed payment amount will be returned through the **calcDelay()** method in **CreditCardPayment** class.

Write the *calcTax()* method in *CreditcardPayment* class by overriding the super class method, according to the above given description.

Note that you do not want to write the implementation of calcDelay() method.

3.

- a. Write two situations where exceptions can occur in computer program.
- b. The following exception has occurred when executing a Java program written by a novice Java programmer.

“Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 3”

Answer the following questions are based on the above exception.

- i. Write the category of the above exception.
 - ii. Using a sample java code explain a possible situation that can results to arise above exception.
 - iii. Write a suitable java code segment to handle the above exception.
- c. In a super market, seasonal discounts are given to several products. If the product code of each product is in the range between 1000 to 3000, then the discount can be applied. The management of the super market has decided to use a program to identify products where discounts should apply. If the product code is not in the given range, the program should display an error message. For this case, write a suitable Java custom exception to throw an exception if the product code is out of the range.
 - d.
 - i. Write one main difference between Multithreading and Multitasking concepts in Java programming language.
 - ii. The following Java classes produce compilation errors upon compilation. Identify the errors and write necessary code segment to correct the classes.

```
public class Test {
    public static void main(String[]args){
        Painter p1= new Painter();
        Painter p2= new Painter();
        p1.start();
        p2.start();
    }
}
class Painter implements Runnable{
    public void run(){
        System.out.println("Painting");
    }
}
```

4.

- a. Write two advantages of client server architecture.
- b. Write the main drawback of setSize() and setLocation() methods, which can be solved through Layout Managers.
- c. Consider the following variable definition of the Book class.

```
Public class Book {  
    private String Title;  
    private String Author;  
    private String ISBN;  
    private float price;  
}
```

Write Java code segment for each of the following operation.

- i. To establish a JDBC connection to the database, "**BookDB**" in mysql database system that installed in a computer with IP address **192.248.10.2** and port number **3300** by using the user "**admin**" and the password "**bookadmin**".
- ii. To create a table, "**Book**" containing all the attributes of the class Book as its fields. Use appropriate types and size for each field. ISBN should be the primary key for the table.
- iii. To insert one row of data to the table "**Book**" with appropriate values using prepared statement.
- iv. To retrieve and print the information of all the books authored by "**James Peter**" from the table "**Book**".
- v. To increase the price by 10% of all the books which are authored by "**William Jane**" from the table "**Book**".

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