

Patuakhali Science and Technology University
Faculty of Computer Science and Engineering
Dept. of Computer and Communication Engineering

Final Examination of B. Sc. Engineering in CSE Level: 1 Semester: II Session: 2020-2021

| Course Code | Course Title | July December 2021 | Credit: 03 |
|-------------|-----------------------------|--------------------|--------------------------|
| CCE-121 | Object Oriented Programming | | Time: 03 Hr Marks: 70 |

Answer any 05 out of 06 Questions (Split answers are highly discouraged)

- 1 [A]** Fill in the blanks in each of the following statements: 0.5*8
=4
- i) If a class declares constructors, the compiler will not create a-----.
 - ii) The public methods of a class are also known as the class's ----- or ----.
 - iii) Lists and tables of values can be stored in ----- and ----- .
 - iv) The number used to refer to a particular array element is called the elements -----.
 - v) A variable known only within the method in which it's declared is called a-----.
 - vi) It's possible to have several methods with the same name that each operate on different types or numbers of arguments. This feature is called method -----.
 - vii) Typically, ----- statements are used for counter-controlled repetition and ----- statements for sentinel-controlled repetition.
 - viii) Methods that perform common tasks and do not require objects are called methods-----.
- [B]** Write a Java statement or a set of Java statements to accomplish each of the following tasks: 3
- a) Sum the odd integers between 1 and 99, using a for statement. Assume that the integer variables sum and count have been declared.
 - b) Print the integers from 1 to 20, using a while loop and the counter variable i. Assume that the variable i has been declared, but not initialized. Print only five integers per line.
 - c) Repeat part (c), using a for statement.
- [C]** *Subject Name* 4
- i) What gives Java its 'write once and run anywhere' nature?
 - ii) What happens at runtime during Java compilation?
 - iii) Can you save a Java source file by another name than the class name?
 - iv) Can you have multiple classes in a java source file?
- [D]** Write a Java program to create and display unique three-digit number using 1, 2, 3, 4. Also count how many three-digit numbers are there. 3
- 2 [A]** What are the various access specifiers in Java? Write an example of public access modifier. 4
- [B]** Write the rules of Constructor. What is the purpose of a default constructor? Explain with example 4
- [C]** i) What is the output of the following Java program? 3
- ```
public class Test
{
 Test(int a, int b)
 {
 System.out.println("a = "+a+" b = "+b);
 Test(int a, float b)
 {
 System.out.println("a = "+a+" b = "+b);
 }
 }
 public static void main (String args[])
 {
 byte a = 10;
 byte b = 15;
 Test test = new Test(a,b);
 }
}
```
- ii)
- ```
class Test
{
    int i;
}
public class Main
{
    public static void main (String args[])
    {
        Test test = new Test();
        System.out.println(test.i);
    }
}
```
- iii)
- ```
class Test
{
 public static void main (String args[])
 {
 for(int i=0; 0; i++)
 {
 System.out.println("Hello PSTU CSE");
 }
 }
}
```
- [D]** Write a Java program to print a pyramid using star pattern. Number of rows input from keyboard. 3
- 3 [A]** What is the static variable? Explain a java program with and without static variable. 3
- [B]** i) What is the difference between static (class) method and instance method? 3
- ii) What are the main uses of this keyword?

- [C] Define Object and Class. Write Object and Class Example: main outside the class and main within the class 4
- [D] Write a Java program to sort an array of given integers using the Bubble sorting Algorithm 4  
 Original Array [7, -5, 3, 2, 1, 0, 45]  
 Sorted Array : [-5, 0, 1, 2, 3, 7, 45]
- 4 [A] Differentiate between the throw and throws keyword. 3
- [B] "Aggregation represents HAS-A relationship."-explain with example. 3
- [C] Is it possible to make any class read-only or write-only in java? How? 3
- [D] What is the use of instance initializer block while we can directly assign a value in instance data member? 3
- [E] How can you achieve abstraction in java? 2
- 5 [A] Write a java program for demonstrating several thread states. 4
- [B] "Java doesn't allow the return type-based overloading, but JVM always allows return type-based overloading."- justify the statement with example. 4
- [C] Multiple inheritances is not supported through class in java, but it is possible by an interface, why? 3
- [D] Can we initialize blank final variable? How? 3
- [A] What will be the output of the following Java programs? 4
- i) class Dog{  
 public static void main(String args[]){  
 Dog d=null;  
 System.out.println(d instanceof Dog);  
 } }
- ii) class A{  
 protected void msg(){System.out.println("Hello java");}  
 public class Simple extends A{  
 void msg(){System.out.println("Hello java");}  
 public static void main(String args[]){  
 Simple obj=new Simple();  
 obj.msg(); } }
- iii)public class JavaExceptionExample {  
 public static void main(String args[]){  
 try{  
 int data=100/0;  
 }catch(ArithmeticalException e){System.out.println(e);}  
 System.out.println("rest of the code...");  
 } }
- iv)class Animal{  
 void eat(){  
 System.out.println("eating...");}  
 class Dog extends Animal{  
 void bark(){  
 System.out.println("barking...");}  
 class Cat extends Animal{  
 void meow(){  
 System.out.println("meowing...");}  
 } }  
 class TestInheritance3{  
 public static void main(String args[]){  
 Cat c=new Cat();  
 c.meow();  
 c.eat();  
 c.bark();}  
 } }
- [B] How to access package from another package? 2
- [C] What is the purpose of join method? 2
- [D] How to perform two tasks by two threads? 2
- [E] What is the Thread Scheduler and what is the difference between preemptive scheduling and time slicing? 4

**Patuakhali Science and Technology University**  
**Faculty of Computer Science and Engineering**  
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Final Examination of B. Sc. Engineering in CSE Level: 1 Semester: II Session: 2019-2020

| Course Code | Course Title                | July December 2020 | Credit: 03 |
|-------------|-----------------------------|--------------------|------------|
| CCE-121     | Object Oriented Programming | Time: 03 Hr        | Marks: 70  |

Answer any 05 out of 06 Questions (Split answers are highly discouraged)

- 1 [A] Explain the purpose of an instance variable. Differentiate between an instance variable and a class variable. 4
- [B] Explain the purpose of a method parameter. What is the difference between a parameter and an argument? Explain with an example. 4
- [C] Write Java code that calculates and prints the sum of the integers from 1 to n. Use a while statement to loop through the calculation and increment statements. The loop should terminate when the value of x becomes n+1. 3
- [D] i) Suppose x = 2 and y = 3. Show the output, if any, of the following code. What is the output if x = 3 and y = 2? What is the output if x = 3 and y = 3?  
if(x>2)  
if(y>2){  
int z=x+y;  
System.out.println("z is "+z);  
}  
else  
System.out.println("x is "+x);  
ii) What does the following code print?  
System.out.printf("\*%n\*\*%n\*\*\*%n\*\*\*\*%n\*\*\*\*\*%n"); 3
- 2 [A] What type of repetition would be appropriate for calculating the sum of the first 100 positive integers? 4  
What type would be appropriate for calculating the sum of an arbitrary number of positive integers?  
Briefly describe how each of these tasks could be performed with an example.
- [B] Write a Java program to check if three given side lengths (integers) can make a triangle or not. 3
- [C] i) What is y after the following switch statement is executed? Rewrite the code using an If-else statement.  
x = 3; y = 3;  
switch (x + 3) {  
case 6: y = 1;  
default: y += 1;  
}  
ii) Fill in the blanks in each of the following statements:  
a) Typically, ... statements are used for counter-controlled repetition and ..... statements for sentinel-controlled repetition.  
b) The do while statement tests the loop-continuation condition ..... executing the loop's body; therefore, the body always executes at least once.  
c) The ..... statement selects among multiple actions based on the possible values of an integer variable or expression, or a String.  
d) The ..... statement, when executed in a repetition statement, skips the remaining statements in the loop body and proceeds with the next iteration of the loop. 2+2
- [D] Write a program that prompts the user to enter a three-digit integer and determines whether it is a palindrome number. A number is palindrome if it reads the same from right to left and from left to right. Here is a sample run of this program:  
Enter a three-digit integer: 121  
121 is a palindrome  
Enter a three-digit integer: 123  
123 is not a palindrome. 3

- 3 [A] Find the error in each of the following program segments. Explain how to correct the error.

4

```
a) void g()
{
 System.out.println("Inside method g");
 void h()
 {
 System.out.println("Inside method h");
 }
}
b) int sum(int x, int y)
{
 int result;
 result = x + y;
}
```

```
c) void f(float a);
{
 float a;
 System.out.println(a);
}
d) void product()
{
 int a = 6, b = 5, c = 4, result;
 result = a * b * c;
 System.out.printf("Result is %d\n",
 result);
 return result;
}
```

- [B] A positive integer is prime if it's divisible by only 1 and itself. For example, 2, 3, 5 and 7 are prime, but 4, 6, 8 and 9 are not. The number 1, by definition, is not prime.

4

- a) Write a method that determines whether a number is prime.  
b) Use this method in an application that determines and displays all the prime numbers less than 10,000. How many numbers up to 10,000 do you have to test to ensure that you've found all the primes?  
c) Initially, you might think that  $n/2$  is the upper limit for which you must test to see whether a number  $n$  is prime, but you need only go as high as the square root of  $n$ . Rewrite the program, and run it both ways.

- [C] Write an application that calculates the average of a series of integers that are passed to method average using a variable-length argument list. Test your method with several calls, each with a different number of arguments.

3

- [D] Write a java code to initialize the elements of an array with an array initializer.

3

- 4 [A] a) Explain the life cycle of a thread with block diagram. Give real life examples of multi-threading and multi-tasking.  
b) Write a Java Program to implement inheritance and demonstrate use of method overriding.

7

- [B] Write a program Using inheritance to create an exception superclass (called **ExceptionOne**) and exception subclasses **ExceptionTwo** and **ExceptionThree**, where **ExceptionTwo** inherits from **ExceptionOne** and **ExceptionThree** inherits from **ExceptionTwo**. Write a program to demonstrate that the catch block for type **ExceptionOne** catches exceptions of types **ExceptionTwo** and **ExceptionThree**.

7

- 5 [A] i. Distinguish between method overloading and method overriding.  
ii. Write a java program to store instructor information (NID, Name, Dept, Salary) into database.

7

- [B] Write a Java program to Create class **SavingsAccount**. Use a static variable **annualInterestRate** to store the annual interest rate for all account holders. Each object of the class contains a private instance variable **savingsBalance** indicating the amount the saver currently has on deposit. Provide method **calculateMonthlyInterest** to calculate the monthly interest by multiplying the **savingsBalance** by **annualInterestRate** divided by 12—this interest should be added to **savingsBalance**. Provide a static method **modifyInterestRate** that sets the **annualInterestRate** to a new value. Write a program to test class **SavingsAccount**. Instantiate two **savingsAccount** objects, **saver1** and **saver2**, with balances of \$2000.00 and \$3000.00, respectively. Set **annualInterestRate** to 6%, then calculate the monthly interest for each of 12 months and print the new balances for both savers. Next, set the **annualInterestRate** to 5%, calculate the next month's interest and print the new balances for both savers.

7

- 6 [A] i. Why are exceptions particularly appropriate for dealing with errors produced by methods of classes in the Java API?  
ii. Write a java program to catch **NumberFormatException** and **ArithmaticException**. In the 'finally' section make sure that it prints "No error" if exception does not occur, otherwise write "Oh! Error!"

7

- [B] Design a basic payroll system of to include private instance variable **birthDate** in class **Employee**. Use class **Date** to represent an employee's birthday. Add get methods to class **Date**. Assume that payroll is processed once per month. Create an array of **Employee** variables to store references to the various employee objects. In a loop, calculate the payroll for each **Employee** (polymorphically), and add a \$500.00 bonus to the person's payroll amount if the current month is the one in which the employee's birthday occurs. [You have a right to add necessary class and methods according to your logic]

7

18-19

Patuakhali Science and Technology University  
Final Examination of B.Sc. Engg. (CSE) Level: 1 Semester: II  
Course Code: CCE 121 Course Title: Object Oriented Programming  
Credit Hour: 3.00 Full Marks: 70 Duration: 03 Hours

[Figures in the right margin indicate full marks. Split answering of any question is not recommended. Write the full question number e.g. 4(B) before the answer paragraph]

*Answer any 5 of the following questions*

1 A What are the principles of Object Oriented Programming (OOP)? Discuss with example. 3

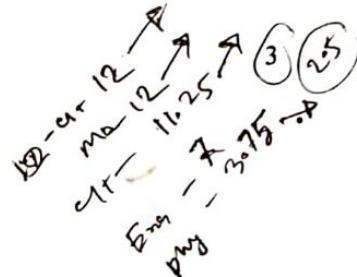
1 B Write a full java program that will read a person's weight (kg) and height (meter) and will calculate the Body Mass Index (BMI). 5

$$\text{BMI} = \text{weight} / \text{height}^2$$

If BMI is < 18, display "You are underweight", if BMI>25 display "You are overweight" else show "Good. You are fit".

1 C Write an application that calculates the product of the odd integers from 1 to 15. 6

2 A class recursion  
{  
    int func(int n)  
    {  
        int result;  
        result = func(n-1);  
        return result;  
    }  
}  
Class Output  
{  
    public static void main(String args[])  
    {  
        recursion obj = new recursion();  
        System.out.print(obj.func(12));  
    }  
}



Write the output of the above code with explanation.

2 B class Teacher {  
    String designation = "Teacher";  
    String collegeName = "PSTU";  
    void does(){  
        System.out.println("Teaching");  
    }  
}  
  
public class PhysicsTeacher extends Teacher {  
    String mainSubject = "Physics";  
    public static void main(String args[]){  
        PhysicsTeacher obj = new PhysicsTeacher();  
        System.out.println(obj.collegeName);  
        System.out.println(obj.designation);  
        System.out.println(obj.mainSubject);  
    }  
}

PSTU  
Teacher  
Physics  
Teaching

```
 obj.does();
}
```

Write the output of the above code with explanation.

2 C Write the difference between method overloading and method overriding with example. 6

3 A Describe the meaning of polymorphism in java with example. Differentiate between compile time polymorphism and run time polymorphism in java. 4

3 B Compare and contrast abstract classes and interfaces. Why would you use an abstract class? Why would you use an interface? 5

3 C How multithreading help to increase parallelism in java? Explain with an example. 5

4 A Explain the purpose of a method parameter. What is the difference between a parameter and an argument? 3

B One of the world's most common objects is a wrist watch. Discuss how each of the following terms and concepts applies to the notion of a watch: object, attributes, behaviors, class, inheritance (consider, for example, an alarm clock), modeling, messages, encapsulation, interface and information hiding. 4

C Write method distance to calculate the distance between two points  $(x_1, y_1)$  and  $(x_2, y_2)$ . 3

All numbers and return values should be of type double. Incorporate this method into an application that enables the user to enter the coordinates of the points.

D An integer number is said to be a perfect number if its factors, including 1 (but not the number itself), sum to the number. For example, 6 is a perfect number, because  $6 = 1 + 2 + 3$ . Write a method isPerfect that determines whether parameter number is a perfect number. Use this method in an application that displays all the perfect numbers between 1 and 1000. Display the factors of each perfect number to confirm that the number is indeed perfect. Challenge the computing power of your computer by testing numbers much larger than 1000. 4

- ~~5~~ A Define Constructor. What happens when a return type, even void, is specified for a constructor? How garbage collector works in JAVA? 3
- ~~6~~ B What are overloaded constructors? Describe with an example. 4
- C Create class `SavingsAccount`. Use a static variable `annualInterestRate` to store the annual interest rate for all account holders. Each object of the class contains a private instance variable `savingsBalance` indicating the amount the saver currently has on deposit. Provide method `calculateMonthlyInterest` to calculate the monthly interest by multiplying the `savingsBalance` by `annualInterestRate` divided by 12—this interest should be added to `savingsBalance`. Provide a static method `modifyInterestRate` that sets the `annualInterestRate` to a new value. Write a program to test class `SavingsAccount`. Instantiate two `savingsAccount` objects, `saver1` and `saver2`, with balances of \$2000.00 and \$3000.00, respectively. Set `annualInterestRate` to 4%, then calculate the monthly interest for each of 12 months and print the new balances for both savers. Next, set the `annualInterestRate` to 5%, calculate the next month's interest and print the new balances for both savers. 7
- 6 A Why are exceptions particularly appropriate for dealing with errors produced by methods of classes in the Java API? If no exceptions are thrown in a try block, where does control proceed to when the try block completes execution? 3
- ~~7~~ B What is the key reason for using finally blocks? Write java code to create a java file and perform read-write to that file? 4
- C Write short note about a) Iterator b) autoboxing c) ArrayList d) auto-unboxing e) set f) collection. 3
- D Define a data-manipulation application for the books database. The user should be able to edit existing data and add new data to the database (obeying referential and entity integrity constraints). Allow the user to edit the database in the following ways:  
a) Add a new author.  
b) Edit the existing information for an author.  
c) Add a new title for an author. (Remember that the book must have an entry in the `AuthorISBN` table.).  
d) Add a new entry in the `AuthorISBN` table to link authors with titles. 4

Course Code  
CCE 121Course Title  
Object Oriented ProgrammingJuly-December  
2017Credit: 03  
Time: 03 Hr  
Marks: 70

Answer any 05 out of 06 Questions (Split answers are highly discouraged and write the full question number e.g. 1(a) before the answer paragraph)

1 (a) What is Java Virtual Machine and how it is considered in the context of Java's platform-independent feature? 2

(b) Classify and explain Java programming error with example. 3

(c) What are the naming conventions for class names, method names, constants, and variables? Which of the following items can be a constant, a method, a variable, or a class according to the Java naming conventions? 4

MAX\_VALUE, Test, read, readDouble //

(d) Write a program that prompts the user to enter the minutes (e.g., 1 billion), and displays the number of years and days for the minutes. For simplicity, assume a year has 365 days. Here is a sample run: 3

Enter the number of minutes: 1000000000  
1000000000 minutes is approximately 1902 years and 214 days

(e) Suppose  $x = 2$  and  $y = 3$ . Show the output, if any, of the following code. What is the output if  $x = 3$  and  $y = 2$ ? What is the output if  $x = 3$  and  $y = 3$ ? 2

```
if(x > 2)
if(y > 2) {
int z = x + y;
System.out.println("z is " + z);
}
else
System.out.println("x is " + x);
```

3

10  
5  
5  
5

2 (a) Suppose you want to develop a program for a first-grader to practice subtraction. The program randomly generates two single-digit integers, number1 and number2, with  $number1 \geq number2$ , and it displays to the student a question such as "What is  $9 - 2$ ?" After the student enters the answer, the program displays a message indicating whether it is correct. Here is a sample run: 4

What is  $6 - 6$ ? Enter  
You are correct!

What is  $9 - 2$ ? 5  
Your answer is wrong  
 $9 - 2$  is 7

(b) What is  $y$  after the following switch statement is executed? Rewrite the code using an If-else statement. 3

```
x = 3; y = 3;
switch (x + 3) {
case 6: y = 1;
default: y += 1;
}
```

This skipping section takes information from the comparing process

(c) Write a program that prompts the user to enter a three-digit integer and determines whether it is a palindrome number. A number is a palindrome if it reads the same from right to left and from left to right. Here is a sample run of this program: 3

Enter a three-digit integer: 121  
121 is a palindrome  
Enter a three-digit integer: 123  
123 is not a palindrome

✓

(d) What are the three parts of a for loop control? Convert the following for loop statement to a while loop and to a do-while loop: 4

```
long sum = 0;
for (int i = 0; i <= 1000; i++)
sum += sum + i;
```

3.75

11  
M

- 3 (a) Design a client-server program for primality testing using connection-oriented service in Java programming language. 6
- (b) What are the disadvantages of connectionless service? Briefly, describe the server creation steps using stream socket. 5
- (c) Write the differences between constructor and method. 3
- 4 (a) What do you mean by synchronization? Suppose you want to read final marks of 50 students stored in an array called "studentResultArray" using five threads. Now design the program using Java programming language and in that case, you must ensure synchronization among threads such that each thread performs the same amount of task without overlapping. 6
- (b) Why are two different methods used to create a thread in Java? Create and test a thread named "DownloadSong" which inherit properties from "PlaySong" class. 5
- (c) "Composition is has-a relationship"-Justify this statement with example. 3
- 5 (a) Differentiate between checked and unchecked exception. Write sample code to create and test a user-defined checked exception called "NameNotFoundException" which return the message "Name not found in database". 6
- (b) Design a class "Account" containing the public method "GetAccountInfo" and another class "Test" which will use the "GetAccountInfo" method. You must ensure that your "GetAccountInfo" method will force the developer to handle "FileNotFoundException" in "Test" class. 5
- (c) What is the difference between termination and resumption model of exception handling? Explain stack unwinding with sample code. 3
- 6 (a) Differentiate among class, interface, and abstract class with example. Why do you think the abstract class is important for software design? Explain with sample code. 6
- (b) Create a class "Shape" which will be inherited by class "Circle" and "Rectangle". Design another class "ShapeUtility" consists of method "PrintShapeInfo" with an argument of "Shape" object. This method will print information according to object type, for example, in case of "Circle" type object; the method will print "Shape is Circle" and so on. Write sample code using the concept of object upcasting and downcasting in Java. 5
- (c) Why subclass constructor call superclass constructor explicitly or implicitly? 3

```

public class A extends B {
 public A() {
 String name = null;
 super(" name is null");
 }
}

public class Test {
 try {
 if (a.name == null);
 System.out.println();
 }
}

```

Dog d = new Dog();  
Dog d = (Animal)d  
Animal a = (Animal)  
/ Animal

[Figure in the right margin indicates full marks. Split answering of any question is not recommended.]  
Answer any 5 of the following questions.

1. (a) What are the differences between process and thread? Depicts the life cycle of a thread. [2+2]
- (b) Write down the sample code of thread creation using Java in two different ways. [5]
- (c) What is deadlock? Explain deadlock situation using synchronized method and synchronized object. [1+4]
2. (a) What is the difference between class and interface? You know that all classes in java are inherited from java.lang.Object class. Are interfaces also inherited from Object class? [2+1]
- (b) Can a class extend more than one classes or does java support multiple inheritances? If not, why? How do you implement multiple inheritances in java? Answer with java sample code. [3+4]
- (c) How do you restrict a member of a class from inheriting to its sub classes? Are constructors and initializers also inherited to sub classes? What happens if both, super class and sub class, have a field with the same name? Override, Java inheritance confusion [2+1+1]
3. (a) What is an exception? Draw the exception hierarchy. Differentiate between checked and unchecked exception with an example. [1+1+2]
- (b) Write down five keywords using in java exception handling with their purpose. How to create custom Exception with Java? [3+3]
- (c) "All catch blocks must be ordered from superclass exception to subclass exception"-Justify this statement with Java code. [4]
4. (a) Create an overload and override version of a method named DISPLAY and overload method must be defined by changing the number of method parameters. Method overloading is not possible by changing the return type of method. Why? [2.5+2.5]
- (b) What is the abstract method? Write a practical scenario where the abstract method can help to design the software. [1+4]
- (c) Briefly describe object upcasting and downcasting. Sample code is appreciated. [4]
5. (a) Create a java class using following attribute (instance variable should be public and method should be private.)  
**Class name: Account**  
**Instance Variable:** account\_holder\_name, amount  
**Method:** WithdrawMoney , Deposit [3]
- (b) What are the differences between method and constructor? [2]

d) What is UML? Draw the UML of following java class

```
class Human
{
 String s1, s2, name;
 public Human()
 {
 s1 = "Super class";
 s2 = "Parent class";
 }
 public Human(String str)
 {
 s1 = str;
 s2 = str;
 }
 private void SetName(String str)
 {
 name = str;
 }
 private String GetName()
 {
 return name;
 }
}
```



1KB - 1024 bytes  
1MB - 1024 bytes/KB

e) Write the output of following programs

```
try
{
 int x = 0;
 int y = 5 / x;
}
catch (Exception e)
{
 System.out.println("Exception");
}
catch (ArithmaticException ae)
{
 System.out.println(" Arithmatic
Exception");
}
System.out.println("finished");
```

compilation error

[3]

```
public class Foo
{
 public static void main(String[] args)
 {
 try
 {
 return;
 }
 finally
 {
 System.out.println("Finally");
 }
 }
}
```

Ans: Finally

b) Briefly describe access modifiers of Java? How do you achieve encapsulation property of [3+1] object oriented programming in your code?

b) Why do you need synchronization in multithreaded program? How do you achieve [2+3] synchronization in your multithreaded program? Explain with code.

c) Consider following condition write a sample java code of inheritance

[5]

- i) Super class : Animal
- ii) Super class contain parameterized constructor
- iii) Sub class: Mammal
- iv) Sub class contain default constructor

Ques. Consider a super class named Animal with an overload method named Walk and an override method named

**Patuakhali Science and Technology University**  
**B.Sc. Engg. (CSE) Level-1, Semester-2 Final Examination-2015 (July-December)**  
**Course Code: CCE-121 Course Title: Object Oriented Programming**  
**Session: 2014-2015 Credit Hour: 3.0 Full Marks: 70 Duration: 3 Hours**

[Figure in the right margin indicates full marks. Split answering of any question is not recommended.]  
 Answer any 5 of the following questions.

1. a) Shortly explain the following terms (using 1-3 sentences and/or a formula and/or an example). 4

- i) OOP iii) Java threads
- ii) Member v) Relationship between a class and an object

b) Why is Java called platform independent? 2

c) Describe the try-throw-catch mechanism. 3

d) What is the differences between abstract class and interface? Why would you use an abstract class? 3

2. a) Define the following terms (using 1-3 sentences and/or a formula and/or an example). 6

- i) Constructor ii) Access modifiers
- ii) Encapsulation iv) Class library

b) Consider the following piece of code: 2

Employee E1 = new Employee("PSTU, CSE", "Md. Mamun", 8000);

Employee E2 = new Employee(E1);

What are the values of the expressions E1.equals(E2) and E1 == E2? Why?

State the different way to override a method. Why return type of the method is not consider in method overloading? 3

Explain with java code.

d) Write a program in Java that simply print the following output on the screen: 3

```
0 0 0 1 1
1 1 1 2 2
2 2 2 3 3
3 3 3 4 4
```

3. a) Write the output of the following programs. 3

|    |                                                                                                                                                                                                                    |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| i) | <pre>public class A {     public static void show() {         System.out.println("Static method called");     }     public static void main(String[] args) {         A obj=null;         obj.show();     } }</pre> |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|     |                                                                                                                                                                                                                       |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ii) | <pre>public class ArrayDemo {     public static void main(String[] args) {         int a[]={1,2,3,4,5,6,0};         for (int i=0; i&lt;a.length; i++) {             System.out.println(a[i]);         }     } }</pre> |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|      |                                                                                                                                                                                                                                           |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| iii) | <pre>public class A {     static int a=5;     static     {         a=(a--)/-a;     }     System.out.println(a); } {     System.out.println(a);     a=a++/1; } public static void main(String[] args) {     System.out.println(a); }</pre> |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

b) Why main method is public and static? 2

c) Given classes A, B, and C, where B extends A, and C extends B, and where all classes implement the instance method void doIt(). How can the doIt() method in A be called from an instance method in C? Why? 2

d) Why socket programming is needed? Sketch the basic client server communication model. Write the java code to create client and server. 3

e) Write a java program to reverse a given String without using String API. 4

~~1~~ Write a while, a do-while and a for loop that will count backwards from 20 to 10.

~~2~~ Shortly explain different types of inheritance.

~~2~~ Differentiate between method overriding and method overloading?

d) Describe two ways of creating thread with code in java. Why java support two different ways of thread creation.

e) Write a class named TestClass and add a String data field called data1. The data field should be private to the class. Now, add a constructor that accepts a starting value for data1 as its single parameter, and public methods for setting and retrieving the value of data1. Call these methods setData() and getData().

~~5~~ Differentiate among instance variable, class variable and local variable.

~~b)~~ What is the difference between a class and a structure?

~~c)~~ i) Is it possible for a class to inherit the constructor of its base class?

~~ii)~~ Can you inherit private members of a class? → public, protected

~~d)~~ What is exception in java? Distinguish between checked exception and unchecked exception.

~~e)~~ Write a java program to calculate sum of following series. Where the value of n is given by user.

$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \dots + \frac{1}{n}$$

~~a)~~ A complete Java program may use the same name for several different methods or variables. Java has a number of features that allow the user to prevent such re-use of names from causing chaos. Describe these under the headings:

(a) Scope rules within individual functions.

(b) Visibility of method names within classes, and the effects of inheritance.

b) Explain how to set up a 2-dimensional array in Java.

c) What are collections and generics in java?

d) Write a Java program that will write a list of double numbers into a file. Your program will then read the content of the file and find the summation of the numbers.

20  
10  
25  
30  
35  
40

CE - 201

**Faculty of Computer Science and Engineering**  
**Patuakhali Science and Technology University**  
Dumki, Patuakhali-8602

Final Examination of B.Sc. Engineering in CSE 2<sup>nd</sup> Semester Level: 1 Semester: 2 Session: 2012-13

|                               |                                             |                       |                           |
|-------------------------------|---------------------------------------------|-----------------------|---------------------------|
| Course Code<br><b>CCE-121</b> | Course Title<br>Object Oriented Programming | July-December<br>2013 | Credit: 3.00              |
|                               |                                             |                       | Time: 3.0 Hr              |
|                               |                                             |                       | Marks: $14 \times 5 = 70$ |

Answer any 05 out of 06 Questions (Split answers are highly discouraged)

- 1 A What is Object Oriented Programming (OOP)? Why OOP is more preferable than other programming technology? 3.50
- B How Java is giving us the OOP features? Give an example. 3.50
- C What are *Class*, *Object*, *Method* and *Properties* in Java OOP? Write your notes using example. 3.50
- D What is the basic idea of inheritance and polymorphism? 3.50
- 2 A Write a **Student** class using Java. Put three *private* properties Id, Name and Grade. Create *averageResult()* method that produce three **student** object's average marks. Write the *main()* function to create three student object of class **Student** and find out the average CGPA. 7.00
- B What is Constructor? How different types of constructors can be used in question no. 3.50
- C Define various types of loop used in Java with example. 3.50
- 3 A How do you store your different type of values in Java? Put your example using Java. 3.50
- B How two dimensional Array is used in different way in Java? 3.50
- C What are the differences among *public*, *private* and *protected* identifiers? 3.50
- D Give an example of *switch* keyword for different value selection in Java. 3.50
- 4 A What is the abstract class? How we can identify the abstract class? 3.50
- B Give an example of super class and sub-class using Java where Class D is sub-class of class C. Class C and Class B are sub-class of Class A. 3.50
- C In 4B, the Class A has d<sub>1</sub>, d<sub>2</sub>, d<sub>3</sub> properties and Class C has c<sub>1</sub>, c<sub>2</sub> properties. Class D has d<sub>1</sub> properties. How the Class D initialize its object using constructor? 3.50
- D How the logical operators are used for condition checking? 3.50
- 5 A Let a user deposit 5000 BDT on 10% interest for 5 years in a Bank. To find out the total amount of BDT after 5 years write the Java code in the main () function. 5.00
- B Now you make the member variable Capital, Rate, Total as public variable. Then write a method to calculate the total amount of BDT. 5.00
- C What are the differences between procedural language and object oriented programming language? 4.00
- 6 A How inheritance and polymorphism works in Java? Give an example. 3.50
- B How we are benefited by polymorphism? 3.50
- C How can we print a Class Object? Which class can access *protected* identifier? 3.50
- D Write a loop in Java where the users are asked to put their full name until they put no where no is to quit the loop. Getting the name list you have to append the name list in the **name\_list.txt** file using Java. 3.50

Tuly (II)

- [4] a. Describe potential divide method in detail. How stabilization of operating point is 03 achieved by this method?

✓ Draw the circuit of a practical single stage transistor amplifier. Explain the function of 05 each component.

- c. In a transistor amplifier, the collector current swings from 2 mA to 5 mA as the base 02 current is changed from 5  $\mu$ A to 15  $\mu$ A. Find the current gain.

d. Write short notes on i) Frequency response and ii) Bandwidth 02

Tank circuit, Transistor, amplifier, feed b.

- [5] a. Define sinusoidal oscillator. What is its need? Discuss the advantages of oscillators. 03

b. Classify transistor oscillators. Describe Hartly Oscillator. 03

c. What is field effect transistor? Describe construction and working principle of FET. 05

What are the differences between a JFET and a bipolar transistor? 03

- [6] a. How does SCR differ from an ordinary rectifier? 02

b. Explain the construction and working of an SCR. 04

c. Define power electronics. What is its significance? 02

d. What are the advantages of a triac over an SCR? 02

e. Explain the construction and working of a triac. 04

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CCE - 2012

Faculty of Computer Science and Engineering  
Patuakhali Science and Technology University

Final Examination of B.Sc. Engineering in CSE Level: I Semester: II Session: 2011-12

| Course Code<br><b>CCE-121</b> | Course Title<br>Object Oriented Programming with Java | July-December<br>2012 | Credit: 03<br>Time: 03 Hr<br>Marks: 70 |
|-------------------------------|-------------------------------------------------------|-----------------------|----------------------------------------|
|-------------------------------|-------------------------------------------------------|-----------------------|----------------------------------------|

Note: Answer 05 out of 06 questions. Split answers are prohibited  
and write the full question number e.g. 2(A) before the answer paragraph

Please give examples and/or figures for each question's answer if required

- 1 [A] What are the basic differences between *Procedural Programming Language* and *Object Oriented Programming Language*? 3
- [B] Define class, object, member variable and member function with respect to Object Oriented Programming paradigm. 4
- [C] Declare a class *Student* where it has three *private* member variables: *Roll, Name, and Faculty*. In the same *Student* class declare a public member function *showResult(float Result[])* that receive an array of three elements(CGPA). Now declare two objects and assign the roll, name, faculty and send the result (three CGPA) to the member function. Again call the function to print the roll, name, faculty and result for that *Student* class object. 7
- 2 [A] What is the meaning of *nested if* and *nested for* in programming language? 3
- [B] Draw the UML activity diagram for the following items: if, if-else, if-elseif-else, for, while, do-while, switch. 4
- [C] Make a member function called *makeCGPA(float Marks)* using this formula: If student's grade is greater than or equal to 90 then print "A", if student's grade is greater than or equal to 80 then print "B", If student's grade is greater than or equal to 70 then print "C", If student's grade is greater than or equal to 60 then print "D" and if below 60 then print "F". 7
- 3 [A] How many loops are available for *Java programming Language*? Define with example. 3
- [B] Define with example: constructor, parameterized constructor and function overloading. 4
- [C] Using a *Random API* of *Java*, generate 20 random numbers and insert them in an array. Now write the java code to find the maximum number and minimum number of the 20 numbers inside the array. 7
- 4 [A] What is *enhanced for* statement? Write the java code using *enhanced for* to add all the values in the array = { 87, 68, 94, 100, 83, 78, 85, 91, 76, 87 }; 3

Faculty of Computer Science and Engineering,  
Patuakhali Science and Technology University

| Final Examination of B.Sc. Engineering in CSE Level: I Semester; II Session: 2010-11                                                                    |                                                      |                       |                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------|----------------------------------------|
| Course Code<br><u>CSE-121</u>                                                                                                                           | Course Title<br>Object Oriented Programming Language | July-December<br>2011 | Credit: 03<br>Time: 03 Hr<br>Marks: 70 |
| Note: Answer any 05 out of 06 Questions (Split answers are highly discouraged and write the full question number e.g. 2(A) before the answer paragraph) |                                                      |                       |                                        |

- (1) (A) Define Class, Object, Method, Instance variable with respect to Java Programming Language 4
- (B) Why we use setMethod and getMethod in Java programming? Give your statements using example. ଆনিন্দ্য 4
- (C) Write a Java program where you use all the items defined in the question 1(A) and 1(B). The program definition is that the user will give capital, interest rate and year value. The program will print the amount of total amount of money after running it. 6
- (2) (A) What is constructor? Define different types of constructor with example. 4
- (B) An object of a Java class can be initialized in many ways. You have to define only three ways with example. 4
- (C) (i) Why we need to use *static* and *final* keyword? Discuss with example with respect to Java programming.  
(ii) How we can replace the idea of *array* in programming? Discuss with example. 6
- (3) (A) What is the difference among public, private and protected data in Java? Discuss with example. 4
- (B) When and how do we use *break* and *continue* keyword? Define with example. 4
- (C) What are the differences among while, do-while and for loop? Make the Java code using while, do-while and for loop for the following problem. 6
- Until a service holder's age is 60 he will get his salary.  
Initially the job holder age is 30 and salary is 22000 TK.  
His salary is increased every year by 15%.
- (4) (A) Make a program in Java language using *switch* keyword where user can give 5 student's marks where  $50 \leq$  marks  $\leq 100$  and the program can identify how many student gets marks between 80 and 100, how many gets marks between 70-79 and how many student get marks between 50 and 69. 4
- (B) What is the solution for taking a large number set for sorting algorithm? How do you produce the different numbers in Java programming? 4
- (C) In Java language, in run time how do you store 5 students' marks of Physics, Chemistry and Mathematics at runtime? What is the code to send and receive this stored data in another method? Define with example. 6