Exam 1.

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1) Define properties of procedure oriented programming in 5-10 sentences? 5 points

* Some properties of Procedure oriented programming are that it employs the top down approach in program design.Functions transform data from one form to another.Data moves openly around the system from function to function.Most of the functions share global data.Large programs are divided into smaller programs known as functions.and there's also emphasis on doing algorithms.

2) Define drawbacks of procedure oriented programming in 5-10 sentences? 5 points

* Some drawbacks are that since every function has complete access to the global variable, a programmer can corrupt the data accidentally by creating a function. We can access the data of one function from another since there is no protection. In a larger program it is very difficult to identify what data is used by which function. If new data is to be added to a program, all the functions needed will be modified to access the data.Data does not model the real world problems very well.

3) Define is top-down approach with an example? 5 points

* The top down approach is the process of breaking the overall procedure or task into component parts and then subdividing each component mobile until the lowest level of detail has been reached. An example is that the payroll system of a company can contain the following modules or tasks; master file,earnings, deductions, taxing, net earnings, and print reports. Another example is Global economy, local economy,sector,industry, specific business.

4) Define is bottom-up approach with an example? 5 points

* It is the reverse top down approach, lower level tasks are first carried out and are then integrated to provide the solution of a single program. Lower level structures of the program are evolved first then higher level structures are created. It promotes code reuse. It also may allow unit testing.An example is employee input, company wide collaboration, tasks completed and sent to higher ups.

5) What are properties of object oriented programming? 5 points

* Properties of Object Oriented Programming are, emphasis on data rather than procedure.Programs are divided into entities known as objects. Data structures are designed such that they characterize objects. Functions that operate on data or on objects are tied together in data structures. Data is hidden and cannot be accessed by external functions. Objects communicate with each other through functions. New data and functions can be easily added whenever necessary. Also object oriented programming follows the bottom up design in design in programming .

6) What are objects? 5 points

* Objects are the things you think about first in designing a program and they are also the units of code that are eventually derived from the process. They are also an abstract data type that are the basic run time entities of an object oriented system.They may represent a person , a place, or any item that the program must handle.When a program is executed the objects interact by sending messages to one another. Each object contains data,and code to manipulate the data.An example is if “customer” and “account” are two objects in a program. Then the customer objects may send a message to the account object requesting for the bank balance.

7) What are classes? 5 points

* Classes are user defined data types and it behaves like built in types of programming language. Once a class has been defined we can create any number of objects for that class. A class is a collection of objects of similar type . An example: ram and sham are names of objects for class students.

8) What is data abstraction? 5 points

* Data abstraction is a programming technique that relies on the separation of interface and implementation.Data abstraction may also be defined as the technique of identifying only the necessary aspects of an object while discarding the extraneous features. An object's characteristics and actions set it apart from other objects of the same type and aid in classifying and organizing the objects.An example is: a car is viewed as a car rather than its individual components.

9) What is data encapsulation? 5 points

* Encapsulation is the process of binding data members and member functions into a single unit.It is the first pillar or principle of object-oriented programming.A class is the best example of encapsulation.An example let's say you go to an Pharmacy to buy some medicines. You go to the Pharmacy and ask for a chemist for the medicines. Only the chemist has access to the medicines in the store based on your prescription. The chemist knows what medicines to give you. This reduces the risk of you taking any medicine that is not intended for you.

Medicines→Member variables

Chemist→ Member methods

you→External Application or piece of code

10) What is inheritance? 5 points

* Inheritance is a mechanism where you can derive a class from another class for a hierarchy of classes that share a set of attributes and methods.It can also be defined as the mechanism of deriving a new class from an old class . the old class is known as base class while new class is known as derived class or sub class. Inheritance is also the most powerful feature of OOP. Using inheritance can save you a lot of time while programming it can also reduce errors. Which will increase the quality and productivity of work . There are different types of inheritance: single, hierarchical, multiple, and multilevel inheritance. An example: consider a family of three members having a mother, father and son named Jack. Jack’s father is tall and dark skinned, but Jack's mother is short and fair skinned .Jack grew up to be tall and fair skinned, so he inherited these features from his mother and father.

11) Write a java program with following specifications: 50 points

Using import java.util.Scanner;

Write a program which will take input as 2 numbers (INT first, INT second) and print 4 outputs (add, subtract, multiply, divide) applying following functions:

add = first + second;

subtract = first - second;

multiply = first \* second;

divide = first / second;

Email java program Exam1.txt to get full points.

Upload Exam1.txt to your Git repository.

JAVA PROGRAM (I used online java compiler) :

import java.util.Scanner;

public class Main

{

static void simplemathOperations(int x, int y){

System.out.println("The sum of "+x+" and "+y+" is equal to "+(x+y));

System.out.println("The subtraction of "+y+" from "+x+" is equal to "+ (x-y));

System.out.println("The product of "+x+" and "+y+" is equal to "+(x\*y));

System.out.println("The division of "+x+" by "+y+" is equal to "+((float)x/y));

}

public static void main(String[] args) {

Scanner sc=new Scanner(System.in);

System.out.println("Enter the first Number");

int num1=sc.nextInt();

System.out.println("Enter the second Number");

int num2=sc.nextInt();

simplemathOperations(num1, num2);

}

}