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| **JAVA**  **ASSESMENT TEST** # **I**  **MAX MARKS : 75 TIME : 180 Minutes** | **Session Objectives**   * *Understand the basics of java programming constructs* * *To understand the control structures* * *Basic understanding of OOP and its features* |

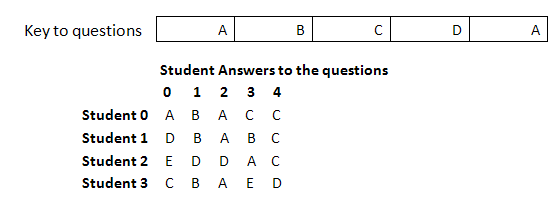
**NAME: \_\_\_\_\_\_\_ MARKS OBTAINED: \_\_\_ / 75 GRADE \_\_\_\_\_**

**I. Fill in the Blanks (10 \* 1 = 10)**

1. Compiled Java code is referred to as \_\_\_\_\_\_\_\_\_\_\_\_.
2. Envisioning program components as objects that are similar to concrete objects in the real world is the \_\_\_\_\_\_\_\_\_\_\_\_\_ programming paradigm.
3. Java is architecturally \_\_\_\_\_\_\_\_\_\_\_\_\_.
4. A Class is \_\_\_\_\_\_\_\_\_\_\_\_\_\_ for creating objects.
5. \_\_\_\_\_\_\_\_\_\_\_\_\_ is used to declare constants in java.
6. The class defines the \_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_ of objects
7. We use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ operator to create an object, and the \_\_\_\_\_\_\_\_\_\_ operator to access members of that object.
8. We can define a new class from an existing class. This is known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. The new class is called a \_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_. The existing class is called a super class, parent class, or base class.
10. Every class in Java is a sub class of \_\_\_\_\_\_\_\_\_\_\_ class.

**II. Coding Exercise (5 \* 4 = 20)**

1. Write an application that allows a user to enter the names and phone numbers of up to 20 Friends. Continue to prompt the user for names and phone numbers until the userenters “zzz” or has entered 20 names, whichever comes first. When the user is finishedentering names, produce a count of how many names were entered, but make certain not to count the application-ending dummy “zzz” entry. Then display the names. Ask the user to type one of the names and display the corresponding phone number. Save the application as PhoneBook.java.
2. Write a program that grades multiple-choice tests. Assume there are 5 students and 5 questions, and the answers are stored in a two-dimensional array. Each row records a student’s answers to the questions, as shown in the following array.



1. Create a java application as follows
   1. A method that computes the final price for a sales transaction and returns that value to a calling method. The method requires three arguments: product price, salesperson commission rate, and customer discount rate. A product’s final price is the original price plus the commission amount minus the discount amount; the customer discount is taken as a percentage of the total price after the salesperson commission has been added to the original price.
   2. Write a main() method that prompts the user for the price of an item, the salesperson’s commission expressed as a percentage, and the customer discount expressed as a percentage, and that then passes the values to the method.
   3. Save the application as Calculator.java
2. a. Create a class named Invoice that contains fields for an item number, name,quantity, price, and total cost. Create instance methods that set the item name,quantity, and price. Whenever the price or quantity is set, recalculate the total (price time’s quantity). Also include a displayLine() method that displays the item number, name, quantity, price, and total cost. Save the class as Invoice.java.

b. Create a class named “TestInvoice” whose main () method declares three Invoice items. Create a method that prompts the user for and accepts values for the itemnumber, name, quantity, and price for each Invoice. Then display eachcompleted object. Save the application as TestInvoice.java.

1. Design a class named Account that contains id, balance. , annualInterestRate, current interest rate, dateAccCreate, A no-arg constructor that creates a default account. , A constructor that creates an account with the specified id and initial balance, the accessor and mutator methods for id, balance,and annualInterestRate. The accessor method for dateCreated , getMonthlyInterestRate() , getMonthlyInterest() , withdraw() , deposit().

(Hint: The method getMonthlyInterest() is to return monthly interest, not the interest rate.

Monthly interest is balance \* monthlyInterestRate.

monthlyInterestRate is annualInterestRate / 12.

Note that annualInterestRate is a percentage, e.g.,like 4.5%. You need to divide it by 100.

**III. Debugging and Tracing Code Snippets. (10 \* 2 = 20)**

**1. What is the output of the following code?**

*double rate = 1.5;*

*double price = 0.0;*

*if(rate >= 0.0 && rate < 1.0)*

*{*

*price = 20 \* rate;*

*}*

*else if(rate >= 1.0 && rate < 2.0)*

*{*

*price = 15 \* rate;*

*}*

*else if(rate >= 2.0)*

*{*

*price = 10 \* rate;*

*}*

*System.out.println(price);*

*}*

**2. How many times does the following loop repeat? What is the output?**

*byte b = 1;*

*do*

*{*

*b++;*

*}while(!(b < 10));*

*System.out.println(b);*

**3. What is the output of the following code?**

*int y = 100, x = 5;*

*while(y > 0)*

*{*

*y--;*

*if(y%x != 0)*

*{*

*continue;*

*}*

*System.out.println(y);*

**4. Identify and fix the errors in the following code:**

*public class Test {*

*public void main(string[] args) {*

*int i;*

*int k = 100.0;*

*intj = i + 1;*

*System.out.println("j is " + j + " and*

*k is " + k);*

*}*

*}*

**5.** **Identify the errors in this program**

*import java.lang.\*;*

*class Hellow2*

*{*

*public static void main(String args[])*

*{*

*int $eno=100;*

*String 1name="Seetaram”;*

*float sal2=7500.99;*

*System.out.printing(" Employee No = "+eno);*

*System.Out.printn(" Employee Name = "+name);*

*system.out.print(" Employee Salary = "+ sal)*

*}*

*}*

**6. Will the program gives an output? If not identify the error and print the output.**

*class Array1*

*{*

*public static void main(String args[])*

*throws IOException*

*{*

*int ar[]={10,20,30,40,50};*

*int tot=0;*

*for(int i=0;i<8;i++)*

*tot=tot+ar[i];*

*System.out.println("Total : "+tot);*

*}*

*}*

**7. Given:**

*public class ArrayTest {*

*public static void main(String[ ] args){*

*float f1[ ], f2[ ];*

*f1 = new float[10];*

*f2 = f1;*

*System.out.println("f2[0] = " + f2[0]);*

*}*

*}*

What is the result?

**8. Which two cause a compiler error? (Choose two.)**

A. int[ ] scores = {3, 5, 7};

B. int [ ][ ] scores = {2,7,6}, {9,3,45};

C. String cats[ ] = {"Fluffy", "Spot", "Zeus"};

D. boolean results[ ] = new boolean [3] {true, false, true};

E. Integer results[ ] = {new Integer(3), new Integer(5), new Integer(8)};

**9.Which two cause a compiler error? (Choose two.)**

A. float[ ] f = new float(3);

B. float f2[ ] = new float[ ];

C. float[ ]f1 = new float[3];

D. float f3[ ] = new float[3];

E. float f5[ ] = {1.0f, 2.0f, 2.0f};

F. float f4[ ] = new float[ ] {1.0f, 2.0f, 3.0f};

**10. What happens when the following program is compiled and run**

*public class example {*

*int i = 0;*

*public static void main(String args[]) {*

*int i = 1;*

*i = change\_i(i);*

*System.out.println(i);*

*}*

*public static int change\_i(int i) {*

*i = 2;*

*i \*= 2;*

*return i;*

*}*

*}*

**IV. Match the following (10 Marks)**

A. this I. Called before the garbage collection

B. bytecode II. Used to define named constants

C. method overloading III.extended version of a super class.

D.static IV Refers to the current instance

E.final V. It is an intermediate code.

F.finalize() method VI. Same copy is available to every object.

G.Subclass VII. Is a kind of polymorphism?

**V. Read the following Problem Statement and Answer. (15 Marks)**

1. Suppose that a program is to be written in Java to solve the following problem: A video rental store wants a program to keep track of its movies. It rents VHS and DVD movies, with each movie given a unique inventory number. Each customer must have a phone number, which is used as his or her membership number. The program needs to keep track of every customer and every movie, including information such as whether a movie is rented or available, who has it rented, and when it is due back. Employees of the store receive a commission on sales of nonmovie items such as candy and popcorn, so this information needs to be maintained as well.

1. Determine the objects in the problem domain.

2. For each object, determine its attributes and behaviors.

2. Suppose you want to develop an application to improve the service to the customers and merchant which in turn increases the sales and profit in “ONLINE SHOPPING”?

1. Identify the attributes for the customer who wish to buy the articles?

2. Identify the attributes and methods for the storekeeper

3. Identify the attributes for items class

4. Identify the attributes for credit card.

5. Write down the suitable methods for the above classes.

**3. CASE STUDY:**

**a) Problem Description:** Course Management System

A Course Management System needs to be developed for an engineering college. The college wants an automated system to replace its manual system for purpose of allocation of students to courses and lecturers to courses. There are 10000 students and 500 faculty members in the college. The engineering college provides graduation and post graduation in the various branches of engineering.

In any branch, the entire duration is divided into semesters. Each semester includes various courses. Students admitted into the college can apply for various courses. The courses are elective in nature. The student needs to select two electives. The electives are offered from 5th semester onwards for graduate students and from 3 rd semester onwards for the post graduate students. The graduate students need to undergo a final year project in the fourth year of engineering whereas the post graduate student undergoes a thesis submission in the second year. The complete list of courses, lecturers and students is maintained in the college.

The list is constant and cannot be updated by the system. The automated system uses this list

for allocation of courses.

The lecturers can be categorized into full time lecturers and visiting members. The full time lecturers have target days and are paid salary every month. The visiting members get paid per lecture basis and do not have any target days.

The system is used by the admin staff to register students admitted to college to the courses opted. The system needs to be authenticated with a login id and password. The system would be used by the student to view the marks and the attendance details also. The system is used by the HOD (Head of the department) to allocate courses to the lecturers. At the beginning of the semester, the HOD will do the allocation of lecturers to the classes for his department.

The HOD may make changes in the allocation during the progress of the course. The system maintains a history of all the lecturers who have handled the courses throughout the semester .The lecturer will use the system to update the marks of the student (project, assignment, internal test marks and the semester end examination marks). The lecturer will also mark the attendance of the students through the system.

In addition to the above, the system also keeps track of the residential status of the student. The student may be a host-elite or a day scholar. If he is host-elite, the system will maintain his / her hostels name, room number and the fees pertaining to the same.

Answer the following:

a. Identify two cases of hierarchy in the given problem statement

b. Identify the common behaviour among the day scholar, host-elite, graduate and post graduate students

c. Identify the different layers possible in this system in terms of the users of the systems

d.The admin staff wants to generate a report containing the scores of students in a batch in the following manner:

**STUDENT ID STUDENT NAME MARKS SCORED LECTURER NAME COURSE\_REGISTERED**

**1 ABC 120 PQR XYZ**

a. Identify the attributes of the Student class. What are the details that can be exposed and what details can be hidden?

b. Consider the calculation of grade for the Student. There are several student types. Let us assume that we need to write a method for the calculation. How many methods would be written? Will they have the same name and signature? Will the functionality /code in these functions remain same?

c. The fees have to be paid by the host-elite and by the day scholars. The host-elites need to pay hostel fees along with semester fees. The day scholars need to pay only semester fees. How many function/s would you code in the Student class and why?

d. For the options a,b and c identify the OOP features that would be implemented.