MANIPAL ACADEMY of HIGHER EDUCATION

Question Paper - Report

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Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

B.Tech III Semester Mid-Term Examination September 2023

OBJECT ORIENTED PROGRAMMING [DSE 2123]

Marks: 30 **Duration: 120 mins**

MCQ

Answer all the questions. Section Duration: 20 min

1) How many super classes can be inherited by a subclass? (0.5

only one zero any number two

2) Which of these keywords must be used to monitor for exceptions? (0.5

try catch finally throw

3) Which of these keywords is not a part of exception handling? (0.5

try thrown throws finally

4) What is the keyword used for declaring a constant variable? (0.5

static constant final const

5) What are the rules to define a constructor? (0.5

The constructor should have the same name as the class and have a void as the return type.

The constructor may not have the same name as the class and has no return type even if void.

The constructor should have, the same name as the class and have no return type even if void.

The constructor may not have the same name as the class but should have a return type

6) What will be the output of the following code? (0.5

```
class exception_handling
{
    public static void main(String args[])
    {
        try
        {  System.out.print("Exception" + " " + 1 / 0);  }

        catch(ArithmeticException e)
        { System.out.print("handled"); }
    }
}
```

handled Exception Exceptionhandled No output

7) Suppose a and b are two integer variables. How do you test whether exactly one of them is zero? Identify the correct statement. (0.5

(a == 0 && b != 0) &&(b == 0 && a != 0)

(a == 0 && b != 0) || (b == 0 && a != 0)

(a == 0 || b != 0) || (b == 0 || a != 0)

(a == 0 || b != 0) && (b == 0 && a != 0)

8) What is the minimum number of argument/s that can be passed to “public static void main(String[] args)”? (0.5

2 0 1 More than 2

9) What will be stored in the String sub after executing the following statement ?

String sub = "Welcome".substring(1,5); (0.5

Welc elco Welco elcom

10) What will s1 contain after executing the following lines of Java code?

```
String s1 = "one";
s1.concat("two");
```

(0.5

one two onetwo twoone

DESCRIPTIVE

Answer all the questions.

11) The International Standard Book Number (ISBN) is a unique numeric book identifier, which is printed on every book. The ISBN is based upon a 10-digit code. The ISBN is valid if:

1 x digit1 + 2 x digit2 + 3 x digit3 + 4 x digit4 + 5 x digit5 + 6 x digit6 + 7 x digit7 + 8 x digit8 + 9 x digit9 + 10 x digit10 is divisible by 11.

Example: For an ISBN 1401601499:

Sum=1×1 + 2×4 + 3×0 + 4×1 + 5×6 + 6×0 + 7×1 + 8×4 + 9×9 + 10×9 = 253 which is divisible by 11.

Create a class called **ISBN** and implement the following methods:

- inputISBN( ) to read the ISBN code as a 10-digit number from the keyboard. (4)
- checkISBN() to perform the following check operations :
  - If the ISBN is not a 10-digit number, output the message “ISBN should be a 10 digit number” and terminate the program.

ii) If the number is 10-digit, extract the digits of the number and compute the sum as explained above. If the sum is divisible by 11, output the message, “Legal ISBN”; otherwise output the message, “Illegal ISBN”.

Note: Do not use any array.

12) Discuss the significance of an abstract class with the help of a relevant example. Also, explain the mechanism by which dynamic method dispatch is accomplished . (4)

13) Create a class, namely, Array_2D that contains a field for storing a 2D-array of integers. Define a static method to reverse each element in the 2D-array and stores the result in a separate 2D-array passed as argument to the static method. Create another class with a main method for creating an instance of the Array_2D class. Write a complete java program.

Input Matrix: $\begin{bmatrix} 26 & 89 \\ 44 & 10 \\ 3 & 76 \end{bmatrix}$ **Output Matrix**: $\begin{bmatrix} 62 & 98 \\ 44 & 1 \\ 3 & 67 \end{bmatrix}$ (3)

.

14) Discuss two approaches for implementing variable length arguments in Java. Explain with a suitable example for each . (3)

15) Create a class called Employee (instance fields: empID, name, age, Salary) with necessary constructor and methods corresponding to the Employee instances used in the EmployeeClassDemo as shown in the Fig 1: (3

```
public class EmployeeClassDemo {
   public static void main(String[] args) {
      Employee[] staff = {  new Employee( 1, "Anil", 25, 50000 ),
                            new Employee( 2, "John", 35, 60000 ),
                            new Employee( 3, "Vinod", 38, 40000 )
                         };
      for( int i = 0 ; i < staff.length; i++ )
         staff[i].raiseSalary( 5 ); // Raise everyone's salary by 5%

      for( int i = 0 ; i < staff.length; i++ )
         System.out.println( staff[i] );
   }
}
```

OUTPUT:

```
Emp id: 1
Name: Anil
Age : 25
salary : 52500.0

Emp id: 2
Name: John
Age : 35
salary : 63000.0

Emp id: 3
Name: Vinod
Age : 38
salary : 42000.0
```

Fig 1: EmployeeClassDemo and Output screen for 15th question

16) Briefly explain any three methods of String class with syntax and example . (3)

17) Given a list of filenames stored in an array of strings. Check whether all the filenames have the same extension or not. Otherwise, throw a user-defined exception, namely, *Invalid_File_Extn*. Define a custom exception handler to display the error message. (3)

18) What will be content of arr1 and arr2 after executing the following statements. Justify your answer.

int arr1[]={ 17 , -15 , 27 } , arr2[]={ 65, 41, -21 };

arr1 = arr2; arr2[1] += 7; (2)

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