

2013
SECTION A (40 MARKS)
Attempt all questions

Question 1

- (a) What is meant by precedence of operators? [2]
 (b) What is literal? [2]
 (c) State the Java concept that is implemented through:
 (i) A superclass and subclass
 (ii) The act of representing essential features without including background details. [2]
 (d) Give a difference between a constructor and a method. [2]
 (e) What are the types of casting shown by the following examples?
 (i) `double x = 15.2;`
 `int y =(int) x;` [2]
 (ii) `int x = 12;`
 `long y = x;` [2]

Question 2

- (a) Name any two wrapper classes. [2]
 (b) What is the difference between a break and a continue statements when they occur in a loop? [2]
 (c) Write statements to show how finding the length of character array `char[]` differs from finding the length of a String object `str`. [2]
 (d) Name the Java keyword that:
 (i) Indicates that a method has no return type [2]
 (ii) Stores the address of the currently calling object [2]
 (e) What is an exception? [2]

Question 3

- (a) Write a Java Statement to create an object mp4 of class digital. [2]
 (b) State the values stored in the variable str1 and str2 [2]
 `String s1 = "good"; String s2 = "world matters";`
 `String str1 = s2.substring(5).replace('t','n');`
 `String str2 = s1.concat(str1);` [2]
 (c) What does a class encapsulate? [2]
 (d) Rewrite the following program segment using the if...else statement
 `comm=(sale>15000)? Sale*5/100 : 0;` [2]
 (e) How many times will the following loop execute? What value will be returned ?
 `int x=2, y=50;`
 `do {`
 `++x;`
 `Y-=x++;`
 `} while(x<=10);`
 `return y; [2]`
 (f) What is the data type that the following library functions return?
 (i) `isWhitespace(char ch)`
 (ii) `Math.random()` [2]
 (g) Write a java expression for $ut+1/2ft^2$
 (h) If `int n[]={1,2,3,5,7,9,13,16}`, what are the values of x and y?
 `x=Math.pow(n[4],n[2]);`
 `y=Math.sqrt(n[5]+n[7]);` [2]
 (i) What is the final value of ctr when the iteration process given below, executes?
 `int ctr=0;`
 `for(int i=1;i<=5;i++)`
 `for(int j=1;j<=5;j+=2)`
 `++ctr; [2]`
 (j) Name the methods of scanner class that:
 (i) is used to input an integer data from the standard input stream
 (ii) is used to input a string data from the standard input stream. [2]

2013**SECTION B (60 MARKS)***Attempt any four questions***Question 4**

Define a class named FruitJuice with the following description :

Instance variables/data members:

- int product_code - stores the product code number
- String flavour - stores the flavor of the juice(eg.orange,apple, etc)
- String pack_type - stores the type of packaging(eg. Tetra pack, PET bottle, etc)
- int pack_size - stores package size(eg.200ml,400ml,etc)
- int product_price - stores the price of the product

Member methods:

- (i) FruitJuice() - Default constructor to initialize integer data members to 0 and string data members to "".
- (ii) void input() - To input and store the product code, flavour, pack type, pack size and product price.
- (iii) void discount() - To reduce the price by 10;
- (iv) void display() - To display code, flavour, pack type, pack size and price. [15]

Question 5

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

The ISBN is legal if:

 $1 * \text{digit1} + 2 * \text{digit2} + 3 * \text{digit3} + 4 * \text{digit4} + 5 * \text{digit5} + 6 * \text{digit6} + 7 * \text{digit7} + 8 * \text{digit8} + 9 * \text{digit9} + 10 * \text{digit10}$ 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.

Write a program to:

- (i) Input the ISBN code as a 10 digit integer.
- (ii) If the ISBN is not a 10 digit number, output the message, "Illegal ISBN" and terminate the program.
- (iii) 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". If the sum is not divisible by 11, output the message, "Illegal ISBN". [15]

Question 6

Write a program that encodes a word into piglatin. To translate word into a piglatin word, convert the word into uppercase and then place the first vowel of the original word as the start of the new word along with the remaining alphabets. The alphabets present before the vowel being shifted towards the end followed by "AY".

Sample input (1) : London, Sample output(1) : ONDONLAY

Sample input (2) : Olympics, Sample output(2) : OLYMPICSAY [15]

Question 7

Write a program to input 10 integer elements into an array and sort them in descending order using the bubble sort technique.

Question 8

Design a class to overload a function series() as follows:

- (i) doubleSeries(double n) with one double argument and returns the sum of the series,
Sum = $1/1 + 1/2 + 1/3 + \dots + 1/n$
- (ii) doubleSeries(double a, double n) with two double arguments and returns the sum of the series
Sum = $1/a^2 + 4/a^5 + 7/a^8 + 10/a^{11} + \dots$ to n terms [15]

Question 9

Using the switch statement, write a menu driven program:

- (i) To check and display whether a number input by the user is a composite number or not. (A number is said to be a composite, if it has one or more than one factor excluding 1 and the number itself. Example : 4, 6, 8, 9.....).
- (ii) To find the smallest digit of an integer that is input.
Sample input: 6524
Sample output: smallest digit is 2
For an incorrect choice, an appropriate error message should be displayed. [15]