

PRE BOARD -I
COMPUTER APPLICATION (GRADE 10)

Maximum Marks: 80

Time allowed: Two hours

This paper is divided into two sections

Attempt all questions from Section A and any four question from Section B.
The intended marks for questions or parts of questions are given in brackets[].

SECTION A

(Attempt all questions from this Section)

Question 1

[20]

Choose the correct answers and write the correct option.

(i) The first value in the initializer list of an array corresponds to index:

- (a) 0 (b) 1 (c) length -1 (d) length

(ii) Because method variables exist only for the lifetime of the method, they cannot be accessed by:

- (a) Same class (b) friend classes (c) composite data types (d) other classes

(iii) What is the difference between the compareTo() and equals() method?

- (a) Return type. compareTo() returns an integer and equals () returns Boolean
(b) Knowledge of the strings. compareTo() returns the lexicographic status while equals() returns only whether the strings are equal or not

(c) Both (a) and (b) (d) They are the same functions, with name changed

(iv) For the following function definition, what is the return type that should be specified?

_____ isBlack (Color colour)

{ if (colour == black)

return (true);

else

return (false);

}

- (a) int (b) short (c) double (d) boolean

(v) In the below code, what are the names of data members of the class?

```
class clock
```

```
{ int hours;
```

```
int minutes;
```

```
void readtime (int h, int m)
```

```
{
```

```
hours = h;
```

```
minutes = m;
```

```
}
```

```
}
```

- (a) hours (b) minutes (c) Both (a) and (b) (d) None of these

(vi) What does the method parseLong(String) do?

- (a) This takes a String object as input and provides a float as return.
(b) This takes a String object as input and provides an integer as return.
(c) This takes a String object as input and provides a long as return.
(d) None of these

(vii) Based on the below Method/constructor, what files have to be imported?

Scanner (InputStream in) ;

(a) java.io.* (b) java.util.Scanner (c) java.io.Scanner (d) java.lang*

(viii) Give the output of the following code:

String A="10", B="11"

int a=Integer.parseInt(A);

int b= Integer.parseInt(B);

System.out.println(a+" "+b);

(a) 10 11 (b) 11 11 (c) 10 10 (d) 11 10

(ix) Scope determines:

(a) The visibility (b) Lifetime of the variable names defined within that scope

(c) Both a. and b. (d) None of these

(x) Which method is used to convert the string into lower case?

(a) toLowerCase() (b) LowerCase() (c) toLower () (d) LowerCase()

(xi) Which of the following is a basic characteristic of indexOf() and lastIndexOf() methods?

(a) Both methods always return either the index position of what is sought or -1 if the search objective is not found.

(b) Both methods always return True or False.

(c) Both methods always return either 0 to 1.

(d) None of these

(xii) _____ is the return type of startsWith() method.

(a) int (b) boolean (c) String (d) char

(xiii) Write the output for the following:

String s="Today is Test";

System.out.println(s.indexOf('T'));

System.out.println(s.substring(0, 8) + " " + "Holiday");

(a) 0 (b) 1 (c) 0 (d) None of these

Today is Holiday Today is Test Today is test

(xiv) Give the output of the following:

Math.floor(-5.9)

(a) -5.0 (b) -9.0 (c) -4.0 (d) -6.0

(xv) Composite data types are formed by using:

(a) Class variables (b) Primitive data type (c) Static data types (d) Method names

(xvi) Rather than use the Character.isLowerCase(ch), what other test can you use to check whether the character is lowercase or not?

(a) if(ch >= 'a' && ch <= 'z') (b) if(ch >= 'A' && ch <= 'Z')

(c) if(ch.LOWER == true) (d) None of these

(xvii) In the below code what is the value stored in res?

int res = 'A';

(a) 65 (b) 97 (c) 101 (d) 110

(xviii) Which of the following cannot have the array type?

(a) Integers (b) Floats (c) Strings (d) None of these

(xix) Why is the method of search between linear and binary that is faster so?

(a) Linear is faster as it is simple and binary is complicated

(b) Binary as subproblem solution is used

(c) Binary as order of elements is made use of

(d) Both (b) and (c)

(xx) What determines both the visibility and lifetime of the variable names defined within that scope?

(a) Data hiding (b) Scope (c) Garbage Collector (d) Encapsulation

Question 2

i) Comment on what type of argument passing is demonstrated in the bolded line in the code below. [2]

```
public static void main(String[] args)
{
    Integer a = new Integer(3);
    Integer b = new Integer(4);
    Process(a, b);
    display();
}
```

(ii) In the below code, label the function argument in the call and definition by specifying which are actual Parameters and formal parameters. [2]

```
public int sum(int a, int b)                (1)
{
    .....
}
public static void main(String[] args)
{
    int x = 20;
    int y = 30;
    int add = sum(x, y);                    (2)
    System.out.println("Sum of two numbers =" + add);
}
```

(iii) Write the Java expression for:

$\sqrt{x^2 + 2x|y|}$ [2]

(iv) Classify the function $\sin(x)$ as one of:

(a) Pure or impure method (b) Static method or object method [2]

(v) A number is being tested for primality in the below code. Fill in the blanks for the code below. [2]

```
boolean isPrime(int x)
{
    for(int i = 2; (1) _____; i++)
    {
        if (x%i == 0)
        {
            Return false;
        }
    }
    return true;
}
```

(vi) Fill in the blanks of the below line related to Java methods.

Constructors without arguments are known as _____ constructors and the ones with arguments are known as _____ constructors. [2]

(vii) Assuming that such correctly coded methods exist, state whether:

(a) $\text{return min}(a, \text{min}(b,c))$ can be considered as the only statement in $\text{min}(a,b,c)$ [2]

(b) $\text{return max}(a, \text{max}(b,c))$ can be considered as the only statement in $\text{max}(a,b,c)$

- (viii) State whether the following two sets of code give errors in Java. [2]
 (a) `Integ a = new Integ(3);` (b) `Float f = new Float(3.0);`
- (ix) Is it possible for a class in Java to not have a constructor? Explain briefly. [2]
- (x) Evaluate the value of this Java expression: [2]
`"ABC".concat("DEF").equalsIgnoreCase("ABCDEF")`

SECTION B

(Answer any four questions from this Section)

The answers in the section should consist of the programs in either BlueJ environment or any program environment with java as the base.

Each program should be written using variable description/memonic codes so that logic of the program is clearly depicted.

Flowcharts and algorithms are not required.

Question 3

Design a class that takes as input two positive integers and outputs the GCD(Greatest Common Divisor) of the numbers. For example:
 8 and 10 are the inputs.
 2 is the GCD

[15]

Question 4

Write a program to input a number and check and print whether it is a Pronic number or not. (Pronic number is a number which is the product of two consecutive integers.)

[15]

Question 5

Define a class to declare a character array of size ten, accept the character into the array and perform the following:

- Count the number of uppercase letters in the array and print.
- Count the number of vowels in the array and print.

[15]

Question 6

Write a program to accept 15 integers from the keyboard, assuming that no integer entered is zero. Perform bubble sort on the integers and then print them in ascending order.

[15]

Question 7

Write a program in Java to accept a word/a string and display the new string after removing all the vowels present in it.

Sample Input: COMPUTER APPLICATIONS

Sample Output: CMPTR PPLCTNS

[15]

Question 8

Overload the display function so that:

Display(): prints the pattern
 1 2 3 4 5

(Print first 5 number with every number followed followed by as many spaces)

Display(int a): prints the pattern
 1 2 3 4 5 a

(The first numbers)

Display(int a, int b): prints the pattern
 a a + 1 a+2 b

(ath to bth number with appropriate spaces)