

This chapter contains a set of sample questions that are generally asked in viva of the practical examination. The answers are dependent on the actual program (here a general assumed answer is given).

**Q 1. What does one understand by OBJECT ORIENTED PROGRAMMING (OOP)? Name two Programming languages based on this.**

**Ans :** Object-oriented programming (OOP) is a programming paradigm that represents concepts as "objects" that have data fields (attributes that describe the object) and associated procedures known as methods. JAVA and C++ are based on OOP.

**Q 2. Define Encapsulation? How is it implemented in Java?**

**Ans :** Binding up of data and associated functions together into a single unit called (class) is called Encapsulation. In Java, it is implemented by the use of a class.

**Q 3. What is meant by Data Abstraction? How is it implemented in Java?**

**A:** The Act of representing only essential features without including its background details is called Abstraction. Data Abstraction can also be defined as the process of hiding the implementation details and showing only the functionality. In Java, it is implemented by the use of interfaces or by making the class abstract.

**Q 4. Defining Polymorphism state how is it implemented in Java?**

**Ans :** It literally means the ability to take 'more than one forms'. The ability of a method to behave in more than one form is called polymorphism. In Java, it is implemented by method (function) overloading (compile time polymorphism) and method overriding (runtime polymorphism).

**Q 5. Define Inheritance stating how it is implemented in Java?**

**A:** The ability of a class to adopt/share the properties (data and functions) completely or partially from another class is called Inheritance. In Java, it is implemented by the use of the keyword, extends.

**Q 6. Define a class? What is an object and how are they created?**

**Ans :** A class is a blueprint or prototype from which objects are created. Objects are instances of a class. Objects are created by declaring them and instantiating them using the new operator in the following way :

`ClassNameObjectName = new ClassName();`

**Example :** `Student book = new Student();` where Book is an Object of the Student class,

**Q 7. What is the use of the term 'out' in System.out.println()?**

**Ans :** 'out' is an object of the 'PrintStream' class and a static data member of the 'System' class which is calling the println() function.

**Q 8. What is the difference between methods print() and println()?**

**Ans :** The print() functions prints a line and the control remains on the same line, whereas, the println() function prints a line and the control moves on to the next line.

**Q 9. Why is it necessary to include a main() function? State why the main method is written public static?**

**Ans :** The execution of the program begins from the main() method. The keyword public is written so that the main() be accessible to the JVM which begins to execute the program from outside of the class. The keyword static makes it available for execution without the need of any Object.

**Q 10. Name the default package of Java? Name two more Packages of Java.**

**Ans :** java.lang is the default package of Java. Two other Packages of Java are java.io and java.util.

**Q 11. State the use of 'new' keyword?**

**Ans :** It is used for dynamic memory allocation to reference data types.

**Q 12. Mention the use of 'this' keyword?**

**Ans :** It is used to refer to the current object (the object which calls the function).

**Q 13. Name some function of StringTokenizer class.**

**Ans :** nextToken(), countToken(), hasMoreTokens() etc.

**Q 14. Name some function of Scanner class.**

**Ans :** next(), nextInt(), hasNextInt() etc

**Q 15. What is the significance of the statement.**

**BufferedReader br = new BufferedReader(new InputStreamReader(System.in)) ?**

**Ans :** To activate the Buffer memory which is a temporary memory facilitating efficient input and output operations. 'br' is an object of the BufferedReader class.

**Q 16. What is the function of readLine() method?**

**Ans :** readLine() method reads a line of text (which you input) and returns the result in the form of a String.

**Q 17. What is the significance of the statement 'Integer.parseInt(br.readLine())'?**

**Ans :** The inputs in a java program comes in the form of String objects which are read using the br.readLine() function. Now if we want the input in integer form, we have to convert it into integer using the parseInt() function of the Integer wrapper class.

**Q 18. What are exceptions?**

**Ans :** Exceptions are runtime errors which prevent the program from working normally.

**Q 19. Mention the two types of exceptions?**

**Ans :** **Checked Exceptions :** Exceptions which are checked (handled) during compile time by the compiler.

**Example :** IOExceptions

**Unchecked Exceptions :** Exceptions which are not checked during compile time.

**Example :** ArrayIndex Out Of Bound.

**Q 20. Mention other ways in which java handles exceptions.**

**Ans :** Various means of handling exceptions in Java include the use of the try-catch block, throws keyword and throw keyword.

**Q 21. What is the difference between throws and throw?**

**Ans :** Using throws keyword, we can give system defined error message if any error occurs, while using throw keyword, we can force an exception and give user-defined error messages.

**Q 22. Stating any two IOException classes, mention why throws IOException is written.**

**Ans :** EOFException and FileNotFoundException are two IOException classes. The statement throws IOException is written in order to handle I/O Exceptions.

**Q 23. Name the primitive data-types in java. Also mention two reference type data.**

**Ans :** The Primitive data types in Java are byte, short, int, long, float, double, char and boolean. Arrays and Strings are reference type data.

**Q 24. What is the significance of including comment statements in a Program? Name the different types.**

**Ans :** Comments are statements which enhances the readability and understanding of the program. They are not part of the program.

The different types are: single line (//...), multiple line (/\* ... \*/) and documenting comment (/\*\*...\*/).

**Q 25. Why is the letter 'S' of System.out.println() function and the letter 'S' of String written in upper case?**

**Ans :** System is the name of a class present in java.lang package and hence it begins with a capital letter as is the convention for class names.

**Q 26. What is a variable?**

**Ans :** A variable is a named memory location whose value can change.

**Q 27. Defining the term constant, state how a variable may be converted into a constant?**

**Ans :** A constant is a literal whose value remains unchanged. By adding the keyword 'final' before a variable declarations.

**Example :** final int a = 5;

**Q 28. What are postfix and prefix operators?**

**Ans :** Both postfix ( a++ or a-- ) and prefix ( ++a or --a ) operators change (increase or decrease) the value of a variable by 1. However in postfix, the old value of the variable is

first used and then the variable is updated to the new value, whereas in prefix, the value of the variable is first updated to the new value and then this new value is used.

**Q 29. What is the difference between if and switch?**

**Ans :** The differences between the if and switch statements are as follows :

(a) if can compare conditions for all data types whereas, switch can only check integers and characters.

(b) All kinds of relations can be checked using if whereas only equality relation can be checked using switch.

**Q 30. Explain the fall-through property of switch statement ?**

**Ans :** In the absence of 'break' keyword after a case in a switch-case construct, the control falls to the next case. This property of switch statement is known as fall-through.

**Q 31. State the difference between break and continue keywords?**

**Ans :** The break keyword stops the complete loop and takes the control out of the loop, whereas, the continue keyword just stops the current iteration and takes the control to the next iteration.

**Q 32. What is the difference between for and while loops?**

**Ans :** The difference lies in the way they are commonly used. The for loop is commonly used when the number of iterations are known whereas, the while loop is commonly used when the number of iterations are not known.

**Q 33. What is the difference between do-while and while loops?**

**Ans :** The do-while loop is exit controlled (i.e. condition is checked at the exit) and runs at least once even if the condition is false whereas, while loop is entry controlled (i.e. condition is checked at the entry) and does not run even once if the condition is false.

**Q 34. What is the difference between recursion and iteration?**

**Ans :** The differences between Recursion and Iteration is as follows :-

- Recursion is usually slower than iteration due to overhead of maintaining stack, whereas, Iteration does not use stack so it's faster than recursion.
- Recursion uses more memory than iteration, whereas, Iteration consume less memory.
- Recursion makes code smaller, whereas, Iteration makes code longer.

**Q 35. What is meant by a wrapper class?**

**Ans :** Wrapper class is a class which wraps (encloses) around a data type and gives it an object appearance. Wherever, the data type is required as an object, this object can be used.

**Q 36. Explain the term modifier?**

**Ans :** A modifier is a keyword placed in a class, method or variable declaration that changes how it operates. Examples of modifiers are: abstract, final, static etc.

**Q 37. What is type conversion? Name its types.**

**Ans :** Converting a value of a particular data type into another data-type is called type conversion. It is of two types :

- (a) **Implicit Type Conversion :** When the conversion takes place on its own without the intervention of the Programmer.
- (b) **Explicit Type Conversion :** When the conversion takes place with the programmer's intervention.

**Q 38. What is the difference between casting and coercion?**

**Ans :** Type Casting refers to Explicit type conversion i.e. When the conversion takes place with the programmer's intervention, whereas, **Coercion** refers to Implicit type conversion i.e. When the conversion takes place on its own without the programmer's intervention.

**Q 39. What is the use of the 'return' keyword? Can there be multiple return statements in a function?**

**Ans :** 'Return keyword is used to return any value from a sub-function to its super-function. It takes the control back from where the method was called.

Yes, a Function may include multiple return statements but only one of them is executed.

**Q 40. Can two functions have the same name? Give examples.**

**Ans :** Yes, this is seen through function overloading and function overriding.

**Q 41. What is the difference between Call by value and Call by reference?**

**Ans :** **Call By Value :** When a function is called by value, then the value of the actual parameter is copied to the formal parameter (i.e. a separate copy is made). Any changes made with the values of the formal parameter does not affect (change) the actual parameter.

**Call By Reference :** When a function is called by reference, then the reference(address) of the actual parameter is sent to the formal parameter. Any changes made with the values at that address of the formal parameter affects (changes) the value of the actual parameter.

**Q 42. What is a constructor?**

**Ans :** It is a member function with the same name as that of a class and is automatically called for initializing the variables of an object.

**Q 43. What is the difference between function overloading and function overriding?**

**Ans :** The differences are stated below :

- In function overloading only the function name is same but function signature (list of parameters) is different, whereas, in function overriding both the function name as well as function signature are same.
- Function overloading takes place within the same class, whereas, function overriding takes place in a child and a parent class.
- Function overloading is an example of static polymorphism, whereas, function overriding is an example of dynamic polymorphism.

**Q 44. What is the difference between linear and binary search?**

**Ans :** Linear search does not require the array to be sorted, whereas, binary search requires that the array be sorted.

Linear search checks for the search item in a linear fashion from the beginning cell till the end, whereas, Binary search repeatedly dividing the array into halves and the search takes place in one of the halves. The element is searched in the middle cell of every half.

**Q 45. What is a queue? Give a real life example to explain the application of Queues.**

**Ans :** It is a linear data structure which follows the FIFO (First In First out) pattern.

Real life example: Queues at the ticket counters.

**Q 46. Explain the concept of stack and State its application.**

**Ans :** It is a linear data structure which follows the LIFO (Last In First out) pattern. Stack memory is used in recursion.

**Application :** It can be used for reversing strings, for evaluating postfix expressions.

**Q 47. What is meant by 'scope of a variable' ? Explain with an example.**

**Ans :** It is the block inside which a variable has been declared and is available for use.

```
for ( k = 1; k<=10; k++ )
{
    int r = 5;
}
System.out.print( " Result = " + r ); // error ,
```

**Q 48. When does the error 'unreachable statement' occur? Explain with example.**

**Ans :** This error occurs when a statement is placed...

- immediately after the return statement in a method
- immediately after the break statement.

**Example :**

```
int fnError1(int k)
{
    int sq = k*k ;
    return sq ;
    System.out.print( " Square of r = " + sq); // Error
}
void fnError2()
{
    int k = 2 ;
    switch (k)
    {
```

```

case 1 : System.out.print(" Good Morning ");
        break;
case 2 : System.out.print(" Good Night ");
        break;
        System.out.print(" Good Evening "); // Error
default : System.out.print(" Good Day" );

```



### Section A Question Papers

#### ISC Computer Science (Solved)

(Theory) 2016-17

Maximum Marks: 70

Time: 3 hours + 15 min