INSTITUTE OF TECHNOLOGY AND APPLIED RESEARCH

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DEPARTMENT OF COMPUTER SCEINCE AND ENGINEERING

Subject Code & Name : CS3391 OBJECT ORIENTED PROGRAMMING

Question Bank

UNIT I - INTRODUCTION TO OOP AND JAVA FUNDAMENTALS
PART-A

1. What is object oriented programming? How does it differ from procedural concepts?

   Object Oriented Programming (OOP) is a new programming paradigm in which programming problem is divided into a set of Objects. Objects are created by combining the data and the related operations (methods).

   In procedural programming problem is divided into set of procedures and those are focused rather than data. But in Object Oriented Programming data is focused rather than algorithm

2. What are the most striking features of Object Oriented Programming?
   - Data hiding and data abstraction
   - Inheritance
   - Polymorphism
   - Dynamic binding

3. Define Objects in Objects Oriented Programming.
   - Objects are the basic dynamic entities in an Object oriented system
   - Objects should be matched closely with the real world Objects.
   - Objects contain data and functions which handles data.

4. What is data abstraction?
   - The technique that reveals the essential features to the user without including the background details is known as Data abstraction
   - Both the data and functions can be abstracted in class data type.

5. What is encapsulation?

   The process of combining data and functions together into a single entity is called Encapsulation Encapsulation plays a major role in Object oriented programming . Because the data and functions are tied into an object, outside world cannot access the data. This is known as data hiding.

6. What is the use of inheritance?

   Inheritance increases the reusability of the code. Because the newly created class by deriving from the existing class will have the combined features of both.

7. What is meant by polymorphism?

   The ability of an object to respond differently to the different messages is known as Polymorphism. Polymorphism provides a way to take elements in more than one form.

8. List the advantages of Object Oriented Programming.
   - Programs can organized as a collection of Objects which can be managed easily.
   - Data hiding provides security to the data, as unrelated functions cannot access its data.
   - Data abstraction enables the user to know only the essential details of an objects.
   - Because each Object is independent, changes in one object will not affect others.
   - Object oriented systems can be easily extended by adding the additional features.
   - Inheritance avoids the redundancy of code.
   - Polymorphism reduces software complexity.

9. Differentiate Object based and Object oriented programming languages.
   - Object based programming approach supports only the objects features and encapsulation mechanisms

   Example: Visual basic
   - Object oriented programming supports object features, inheritance and polymorphism.

   Example: C++, Java, Small talk

10. Compare Object oriented and structured languages.

Object oriented	Procedural and Structured
• Program problem is divided into set of an objects • Emphasize is one data rather than algorithm	• Program problem is divided into set procedure or subroutines • Emphasize is on algorithm rather than data

11. List any four applications of OOPs.
    - Real time systems
    - Simulation and modeling
    - Object oriented databases
    - Hypertext and Hypermedia

12. List the features of java.
    - Object oriented programming
    - Compiled and interpreted translation
    - Plat independent and portable codes
    - High security
    - Disturbed network support
    - Multi thread support
    - Dynamic linking
    - Automatic garbage collection
    - Direct database access
    - Core XML support

13. What kind of program can be developed in java?

    Java is an object oriented, general purpose, portable programming language. It is suitable for both internet programs and application programs. So ,two kinds of java programs can be developed. They are
    - Stand-alone applications
    - Web applets

14. What are tokens?

Tokens are the smallest individual functions in the program. Tokens are constructed from java support character set. Expressions and statement are constructed from tokens. They are divided into 5 types. They are

- Keywords
- Identifiers
- Constants
- Operators
- Separators

15. What are keywords?

Keywords are the special reserved words having special meaning to the java compiler. These are reserved for special purpose in the program coding. So keywords cannot be used as identifiers. All the keywords represented as lower case letters

Example: Abstract , continue , goto

16. What are the rules to be followed to form identifiers?

- It can consist of alphabets, digits, underscore(_) and dollar sign
- It must not start with digit
- It can be of any length
- It is case sensitive. That is upper and lower case letters are distinct

17. How does character constant differ from string literal?

Character constant	String literal
Single character is used	Sequence of characters are used
Enclosed between single quotes	Enclosed between double quotes

18. In which situations , the conditional operator is replaced by if….else statement?

Even in conditional operator follows simple structure, When nesting is made that becomes too complex and nesting gives logical errors. In this kind of situations if….else statement is used.

19. What is the difference between the statements a++ and ++a?

++a - pre increment (after the increment value of a is used)

a++ - post increment (before the increment value of a is used)

Example

If a=10 means

a++ gives 10 and then a becomes 11

++a becomes 11 and gives 11

20. List the separators available in java.

Separator	Functions
( )	It is used to close the parameter of the function
{ }	It is used to block a group of code
[ ]	It is used to specify the array index
;	It is used to terminate a java statement
,	It is used to separate variables in a declaration and used in the loops
.	It is used to access the member of class.

21. What are variables? How will you declare it?

Variable is a memory location identifier used to store a data (values).Variable name must be a valid identifier.

Example:

Mark 1
Book _name$

Declaring variables

Before declaring variable in a program it has to be declared. Declared tells the following information to the compiler.

- Name of the variable
- Type of the data that is going to be stored

22. What is the use of control structures?

Control statements are used jump from one part of a program to another part of program.

23. What are the differences between switch and nested if…else statement?

Switch	Nested if…else
Floating point and instances cannot be compared	Floating point and instances can be compared
Only once the expression is evaluated	More than once condition is evaluated at each if
Handling ranges is very complex	Handling ranges is not a problem

24. What is else…if ladder?

Ina nested if…else statement, if each if block is associated with else block, then it is known as else if ladder.

25. Write a program to print the elements in a array using enhanced for loop.

```
Class sample{
  Public static void main(}) {
   Int a[ ]={10,20,30,40,50,60,70,80,90,100};
            }     }      }
```

26. What are the differences between break and continue statements?

Break	Continue
It slopes the execution of current loop	It forces the execution of the next iteration
It can be used in switch statement	It can be used in switch statement

27. List the characteristics of a class.

- It can have fields and methods.
- It can have static and final members.
- It can be derived from another class.
- It can be implemented from the interfaces.
- A class and members can be preceded with an access specifier.
- It can be normal or abstract

28. How will you define a class.

Defining a class consists of two steps. They are

- Fields declaration
- Methods definition

29. What are the methods available to initialize a field?

- Explicit initialization method
- Initializing with constructors method
- Initializing block method

30. What are Initializing blocks?

Class declaration can have blocks of code to initialize fields. These blocks are Automatically executed whenever an object of class is created

```
Class Add     {
     Int Num1,Num2,,Obj_num:
     Static int count;
     //initialization block
   {       Num1=0;
           Num2=0;
    Obj_num=++count;
}              …              }
```

31. What is the purpose of using this keyword?

This keyword is used to refer the object which invoked the method. This keyword can be used inside any method to refer the current object. That is, this always has reference to the object on which the method was invoked. Normally a method is called is called with two types of arguments implicit and explicit. Implicit arguments is assigned to this

Example

```
Void Change_val(int Num1,int Num2) {
     this.Num1=Num1;
    this.Num2=Num2;    }
```

32. What are parts available in the method?

- Method name- The name that is used to invoke the method. It must be a valid identifier.
- Arguments list –List of values with the data types that are required to do the Process.
- Method body- The process that to be done by this method.

33. What are three key characteristic of an objects?

- Identify – the name to identify the object uniquely among the multiple objects
- Behaviour – the process that can be done on the fields by the objects
- state – the changes in the data after the processing or initialization

34. How will you create objects?

Objects are instantiated using new Operator. The new operator creates an objects of the specified class and returns a reference to the object. Memory space is allocated only to the fields and not to the methods.

Example

```
ADD A;                  //declares the object
A=new ADD;              //instantiates the objects
```

35. What are implicit and explicit arguments?

Method of class to receive two types of arguments while calling using objects. They are explicit and implicit arguments. Object name in a method call is the implicit argument and the

arguments passed between the parameters are explicit arguments. Implicit argument make this object which refers to the current object.

Example

A.Init-num(10,20);

Here A is the implicit argument and 10 and 20 are explicit arguments.

36. List the access specifiers.
    - private
    - protected
    - public

37. When is private specifier used?
    - Fields and the methods are to be protected highly are declare with private specifier
    - private members are accessible only with its own class
    - private members are not inherited in the subclass
    - private methods acts like final methods

38. What meant by static field?

A field can be declared with static. Static fields are also known as class fields. Because it is not related to any object. Normally each object has its own copy of all instance fields.But, only one instance is created for each static field and that is shared by all the static objects. Static fields are common to all the objects. So class name is enough to access the static fields. But it is legal to use an object to access a static field .

39. What are the characteristics of static methods?
    - It can be access only the static fields and the static methods.
    - It can be accessed by the normal and static methods of its own class.
    - It can be accessed using the class name or object name from another class
    - It cannot refer this and final

40. What are default of a constructor?
    - It can be used to initialize the fields.
    - It can be used to allocate memory to the fields.

41. What is a default constructor?

Default constructor is a constructor with no arguments. If no constructor is defined in a class, then a default constructor is automatically provided by the compiler. This default constructor assigns default values to all the fields in class. That is ,0 is assigned to all the numeric fields and false is assigned to all Boolean fields and null is assigned to all the objects. If at least one constructor is defined in a class, the compiler will not include any default constructor and then it is illegal to construct objects without construction parameters.

42. What are the steps followed when a constructor is called?

Default values are assigned to all the fields.

Field initializers and initialization blocks are executed one by one as they are declared in the class. If the first line of a constructor invokes the second constructor, the second constructor is executed. The first constructor continues to the completion.

43. What are advantages of using packages?
    1. Classes can be easily reused
    2. Two classes in different packages can have same name
    3. It provides way to hide classes

44. What is the use of static imports?

This eliminates the need of class name before static members. Static import is similar to normal import. But it uses the static keyword after import keyword.

45. How will you hide a class in packages?

Only the public classes in a package are accessible from outside. Non_public classes are not accessible. Thus the classes are hidden in a package.

46. List the type of comments.

1. Classes comments
2. Method comments
3. Field comments
4. Package and overview comments

47. What are the tags that inserted in a class comment?

@author name

This tag adds entry about the author. Multiple author tags can be put.

@version text

This tag adds entry about the version. The text can be any description of the current version.

@since text

This tag adds the entry about the version that introduced this feature.

@deprecated text

This tag adds description that the class,methods,or variable should not be used.

@see reference

This tag adds a hyperlink in the see also section. It can be used with both the classes and methods.

48. What are packing comments?

Class, method, and variable comments are placed directly into the java source files, delimited by//**...*/ documentation comments. But, to generate package comments, a separate file is to be added in each package directory. For this two methods are used.

49. What is meant by array?

Array is a collection of similar data type values that share a common name. Each element in a array can be accessed by using the index number or subscript.

50. How will you declare an array?

An array declared by specifying the data type followed by [ ] with array name. Array declaration only declares the name of an array. No memory space is allocated. so we cannot use it before instantiation. Size should not be given to an array at the time of declaration.

Example

```
int mark[ ];
```

51. How is an array length is extracted?

Size of an array can be obtained by accessing the attribute length.

Example: b size=mark.length;

52. What is meant by Anonymous Array?

An anonymous array is array created without any name. It is used to reinitialize an array without creating a new variable.

Example

```
mark=new int[ ] { 10,20,30,40,50,};
```

53. What is meant by ragged arrays?

Ragged arrays are the arrays in which different rows have different lengths. In java multidimensional arrays are represented as arrays, that is, collection of one dimensional array. There are no multidimensional arrays in java

Example

```
int a[ ][ ]=new int[2][ ];
a[0]=new int[5];
a[1]=new int[10];
```

now a contains 5 elements in first column and 10 elements in the second column.

PART-B

1. Discuss the basic concepts of OOP.
2. How is OOP different from procedural languages? Explain.
3. What is constructor? What is the use of new method?
4. Explain in detail about static method and its initialization.
5. Explain arrays in java.
6. What is class? How do you define a class in java?
7. Explain the features of OOPS.
8. Define packages. Explain the types of package with its importance.
9. Discuss in detail the access specifies available in java. Explain the different visibility controls and also compare with each of them.
10. Explain the different types of operators with example.
11. Illustrate with the examples: static and final
12. Explain with example if and switch statements.
13. Explain the looping statements with example.
14. What is java doc? Explain the comments for classes, methods, fields and link
15. Write the java program using arrays to do the following
    - to copy one array context to another array.
    - to arrange the numbers in ascending order.
    - find the maximum of an array