CORE JAVA

1. **What is Language?**
2. **What is programming Language?**
3. **Types of Programming languages'?**
   a) Machine Language
   b) Assembly Language
   c) High Language
4. **Difference Product and Project.**
5. **Procedure Oriented Programming Language.**
6. **What is Object Oriented Programming Language.**
7. **Introduction to Java**
8. **Principles of Java**
   a) Simple
   b) Platform Independency
   c) Architectural Neutral
   d) Portable
   e) High performance
   f) Robust
   g) Secure
   h) Multithreaded
   i) Distributed
   j) Dynamic
   k) Oops
9. **Oops Introduction**
   a) Abstraction
   b) Encapsulation
   c) Inheritance
   d) Polymorphism
10. **Java Programming Elements**
    a) Identifiers and Naming conventions
    b) Keywords
    c) Operators
    - Assignment operator
    - Arithmetic operators
    - Conditional operator
    - Increment/Decrement operators
    - Relational operators
    - Logical operators
    - Bitwise operators
    - Shift operators

- Compound assignment operators

d) Separators

e) Literals

i. Integral Literals
ii. Floating Literals
iii. Character Literals
iv. Boolean Literals
v. String Literals
vi. Underscore in integral literals

f) Comments

✓ Single level Comment
✓ Multi level Comment
✓ Document Comment

g) Data types

1. Primitive data types

a) Byte, short, int, long, float, double, char, Boolean

2. Referenced Variables

a) Arrays
b) Class
c) Interface
d) Enum
e) Annotation
f) Escape Characters

11. Casting

a) Implicit Casting
b) Explicit Casting

12. Arrays

a) Single Dimensional arrays
b) Double Dimensional arrays
c) Multi Dimensional arrays
d) Anonymous arrays
e) Jagged arrays

13. Statements

a) Sequential statements

b) Control Statements

I. Conditional control statements

II. Loop control statements

- for
- while
- do..while
- Enhanced for loop/for-each loop

III. Branching statements

Switch with String parameter

14. Variables and type of variables

i. Class level Variables

1) Static variables
2) Non-static variables

ii. Local Variables

15. Blocks

a) Static blocks
b) Non-static blocks

16. Methods and type of methods,

a) Static methods
b) Non-static methods
c) Void methods
d) Non-void methods
e) Parameterized methods
f) Non-parameterized methods
g) Abstract Methods
h) Concrete Methods
i) Variable arguments in method parameters
j) Default methods in interface
k) Static methods in interface

17. Wrapper classes

a) Number
b) Byte
c) Short
d) Integer
e) Long
f) Float
g) Double
h) Character
i) Boolean

18. Conversions

a) Auto Boxing
b) Auto Un Boxing

19. Packages

a) How to create single package
b) How to sub packages

c) How to package in other directory
d) How to Access other packages
e) Static import statement
f) General import statement
g) Difference between #include and import statements

20. Accessibility Modifiers
a) Private
b) Protected
c) (package private) or default
d) public

21. Jar and its handling

22. How to create batch files

23. Data Hiding

24. Data Abstraction

25. Encapsulation

26. Command Line Arguments

27. Java.util.Scanner class and its method

28. Inheritance and Types of Inheritance
a) Single Level Inheritance
b) MultiLevel Inheritance
c) Hierarchal Inheritance
d) Multiple Inheritance
e) Hybrind Inheritance

29. Interfaces
- General interface
- Functional interface
- Marker/tagling interface

30. Abstract Classes

31. Polymorphism
a) Static polymorphism
b) Dynamic polymorphism
c) Method overloading
d) Method Overriding
e) Covariant return types
f) Method Hiding

32. Inner Classes
a) Non-static inner class/simple inner class
b) Static inner classes
c) Method level inner classes
d) Anonymous inner classes

33. Java.lang.Object
a) getClass()
b) toString()
c) hashCode()
d) equals
e) clone()
a. Deep cloning
b. Shallow cloning

34. JVM architecture

35. String Handling
a) Introduction to Strings
b) Creating objects to String
c) String Constant Pool
d) String library functions
e) Mutable objects
f) Immutable objects
g) String/StringBuffer/StringReader
h) Creating Immutable class

36. Exception Handling
a) Introduction to Error and Exception and Syntax Errors
b) Types of Exceptions
i. Checked exceptions
- Fully Checked Exceptions
- Partially Checked Exceptions

ii. Un checked exceptions
c) Try, catch, throw, throws, finally
d) Nested try blocks
e) Multiple catch blocks
f) Handling exceptions
g) User defined exceptions
h) Chained Exceptions
i) Try with resource
j) Catch block with multiple exceptions.

37. IOStreams
a) What is Stream
b) Types of Streams
a. Byte Streams
b. Character Streams

c) FileOutputStream
d) FileInputStream
e) DataOutputStream
f) DataInputStream
g) FileWriter
h) FileReader
i) InputStreamReader
j) Serialization
k) De serialization
l) Customization
m) Externalization
n) PrintStream
o) System.out.println
p) Console

38. Multithreading

a) Introduction to multi tasking and multi threading
b) Drawbacks in multi tasking
c) Creation of Thread
d) Life cycle of Thread
e) Thread class
f) Runnable interface
g) Constructors of Thread class.
h) Inline Thread Creation
i) Priorities of threads.
j) Naming to threads.
k) Synchronization
l) sleep(),join(), wait(), notify(), notifyAll(),
m) TheadGroup
n) DeadLock
o) ThreadPoll introduction
p) ExecutorFrameWork
q) ThreadLocal
r) RseentrantLock

39. Net Working

a) Introduction to networks
b) Types of networks
c) Client
d) Server
e) Client machine
f) Server machine
g) Request
h) Response
i) IP Address
j) Port
k) Socket
l) Client –server architecture
m) Socket programming example

40. Collection Framework and Generics

a) Introduction to collections
b) Introduction to generics
c) Difference between arrays and Collections
d) Collection interfaces

i. List Interface

- ArrayList
- LinkedList
- Vector
- Stack

ii. Set Interface

- Hashtable
- HashSet
- LinkedHashSet
- SortedSet
- NavigableSet
- TreeSet

iii. Map Interface

- Dictionary
- HashTable
- Properties
- HashMap
- LinkedHashMap
- IdentityHashMap
- WeakHashMap
- SortedMap
- NavigableMap
- TreeMap

iv. Queue Interface

1) LinkedList
2) PriorityQueue
3) BlockingQueue

- LinkedBlockingQueue
- PriorityBlockingQueue

e) Collections Class
f) Arrays Class
g) Enumerations
h) Iterator
i) ListIterator
j) Comparator
k) Comparable
l) Java.util.Stream api
m) New date and time api
n) Java.util.concurent package introductions and related implementation classes information
   i. CopyOnWriteArrayList
   ii. CompyOnWriteArraySet
   iii. ConcurrentHashMap

41. Date and Formatting text, Random, StringTokenizer

42. Internationalization.

43. API documentation and How to use it.

44. Annotations

a) Meta annotations
- Target
- Retention
- Inherited
- Documented
- Repeatable
- Native

b) Standard annotations
- Deprecated
- Override
- SuppressWarnings
- SafeVarargs
- FunctionalInterface

45. Reflections API

Java.lang.Class
Java.lang.reflect.Method
Java.lang. reflect.Field
Java.lang. reflect.Modifier
Java.lang. reflect.Constructor

46. RegularExpression

a) Pattern
b) Matcher

47. Enums

Java 8 features:

a. Lambda Expressions.
b. Method References.
c. Functional interface.
d. Predefine functional interface
e. Stream API.
f. Default Methods in interface.
g. Static methods in interface
h. Collectors class.
i. Optional Class.
j. LocalDate,LocalTime,LocalDateTime,Period,Year
k. Type inference
l. StringJoiner class.
m. Nashron javascript engine
n. Base64 encode and decode.
o. Parllel array sort.
p. Parameter reflection.

Java 9 features:

1. Jigsaw
2. JShell
3. Try with resource extra configuration
4. Factory methods in collection
5. Private methods in interface
6. Enhancements in stream api
7. Http2 client
8. G1 Garbage collector