

ObjectOrientedProgrammingThroughJava(25IT303)

Worksheet

UNIT-4:MULTITHREADING,COLLECTIONS

A. MultipleChoice Questions

1. Whichclassor interfacemustbeextendedorimplementedtocreateathreadinJava?

- A) ThreadclassorRunnableinterface
- B) Processclass
- C) Taskinterface
- D) Appletclass

Answer:A

2. Whichmethod isused tostarttheexecutionofathread inJava?

- A) run()
- B) start()
- C) execute()
- D) init()

Answer:B

3. Whichmethodcontainstheentry-pointcodefor athread's execution?

- A) start()
- B) main()
- C) run()
- D) init()

Answer:C

4. Whichmethodisusedtocheckwhetherathreadisstillrunning?

- A) `isAlive()`
- B) `isRunning()`
- C) `active()`
- D) `checkAlive()`

Answer:A

5. Which method causes the current thread to wait until another thread finishes its execution?

- A) `wait()`
- B) `join()`
- C) `sleep()`
- D) `yield()`

Answer:B

6. Synchronized methods in Java are used to prevent:

- A) Memory overflow
- B) Thread deadlock
- C) Race conditions/Concurrent data corruption
- D) Compilation errors

Answer:C

7. Which collection class allows dynamic resizing and maintains insertion order?

- A) `Array`
- B) `ArrayList`
- C) `HashSet`
- D) `TreeSet`

Answer:B

8. Which collection implementation does NOT allow duplicate elements?

- A) `ArrayList`
- B) `Vector`

- C) TreeSet
- D) LinkedList

Answer:C

9. Which interface represents key-value pairs in the Java Collections Framework?

- A) Collection
- B) Set
- C) Map / HashMap
- D) List

Answer:C

10. Which interface is used to traverse through a collection element by element?

- A) Iterator
- B) Comparator
- C) Enumeration
- D) Collector

Answer:A

11. Which interface is used to define custom sorting logic for objects?

- A) Runnable
- B) Comparator
- C) Iterator
- D) Comparable

Answer:B

12. Which collection class maintains elements in a sorted ascending order?

- A) Vector
- B) ArrayList
- C) TreeSet
- D) HashMap

Answer:C

13. What is the legacy synchronized counterpart of ArrayList in Java?

- A) LinkedList
- B) Vector
- C) HashSet
- D) Hashtable

Answer:B

14. Which method of the Object class is used to notify a waiting thread to wake up?

- A) resume()
- B) notify()
- C) wake()
- D) start()

Answer:B

15. What is the minimum and maximum priority value a thread can have in Java?

- A) 0 and 10
- B) 1 and 10
- C) 1 and 5
- D) 0 and 100

Answer:B

B. Fill in the Blanks

1. Every Java application has at least one thread called the main thread.
2. A thread can be created either by extending the Thread class or implementing the Runnable interface.
3. The start() method allocates resources and calls the thread's run() method.
4. The isAlive() method returns true if a thread has been started and has not yet terminated.
5. The join() method allows one thread to wait for the completion of another.
6. Multi-threaded access to shared resources is controlled using the synchronized keyword.
7. Inter-thread communication relies on the wait(), notify(), and notifyAll() methods defined in the Object class.

8. The **ArrayList** class provides a dynamically resizing array implementation of the List interface.
9. A collection that contains unique elements and maintains no specific order is **HashSet**.
10. The **TreeSet** class stores unique elements in a sorted, ascending order.
11. Data stored in a **HashMap** consists of key-value pairs.
12. An object of the **Iterator** interface is used to step through the elements of a collection one by one.
13. Custom ordering of objects can be implemented using the **Comparator** interface.
14. The **Vector** class is a synchronized legacy list implementation in java.util.
15. Suspending and resuming thread execution can be controlled programmatically using thread state management methods.