1. The wrapper class for the primitive type `int` is ________________.

2. Write a statement that copies the elements in the `data` array to the `newData` array.
   
   ```java
double[] data = new double[15];
double[] newData = new double[2 * data.length];
```

3. The code below yields a two-dimensional array with ________________ elements.
   
   ```java
final int ROWS = 4;
final int COLUMNS = 3;
String[][] board = new String[ROWS][COLUMNS];
```

4. To treat primitive type values as objects, you must use ________________ classes.

5. Whenever you retrieve an element from an untyped array list, the compiler requires you to use a(n) ________________.

6. Based on the following statement, `primes[3]` = ________________.
   
   ```java
int[] primes = {2, 3, 5, 7, 11};
```

7. A(n) ________________ is a sequence of values of the same type.

8. The __________ for loop traverses all elements of a collection.

9. The term ________________ arrays describes two arrays of the same length, in the same program.
10. The following search process is called a(n) __________________ search through the array list.

```java
public class Bank {
    public BankAccount find(int accountNumber) {
        for (BankAccount a : accounts) {
            if (a.getAccountNumber() == accountNumber) // Found a match
                return a;
        }
        return null; // No match in the entire array list
    }
    ...
}
```

11. One of the uses of the ____ method is to add or remove elements in the middle of an array.
   A) Boolean.booleanValue
   B) System.arraycopy
   C) ArrayList.size
   D) Array.remove

12. Based on the statement below, the angle brackets around the BankAccount type indicate that BankAccount is a(n) ____.

```java
ArrayList<BankAccount> accounts = new ArrayList<BankAccount>();
```
   A) wrapper class
   B) generic class
   C) primitive type
   D) type parameter

13. Based on the statement below, which of the following codes will cause an error?

```java
ArrayList<BankAccount> accounts = new ArrayList<BankAccount>();
A) BankAccount anAccount = new BankAccount(1729);
    accounts.set(2, anAccount);
B) accounts.add(new BankAccount(1015);
C) int i = accounts.size();
    anAccount = accounts.get(i);
D) import java.util.ArrayList;
```
14. The code below is equivalent to ____.

```java
Double d = new Double(29.95);
A) int d = 29.95;
B) Double d = 29.95;
C) Double d = new <Double>(29.95);
D) Double d = new ArrayList<Double>(29.95);
```

15. Arrays suffer from a significant limitation: ____.
   A) index values range from 0 to length + 1
   B) you cannot determine the number of elements in the array
   C) you cannot copy values from one array to another
   D) their length is fixed

16. Based on the statement below, which of the following statements gives the length of the data array?

```java
double[] data = new double[10];
A) data.size()
B) data.length
C) data.size
D) data.length()
```

17. Which of the following is considered illegal in Java?
   A) int[][][] a = new int[3][3][3];
   B) int[][] a = new int[5][5];
   C) double[] a = new double[5][5];
   D) double[] a = new double[10];

18. ____ can be used to grow an array that has run out of space.
   A) System.ArrayList
   B) ArrayList.resize
   C) System.arrayResize
   D) System.arraycopy
19. What is the error in the following code fragment?

```java
double[] data = new double[20];
data[20] = 15.25;
```

A) A cast is required  
B) data not initialized  
C) A two-dimensional array is required  
D) Out-of-bounds error

20. Wrapper objects can be used anywhere that objects are required instead of ____.

A) generic classes  
B) clone methods  
C) primitive data types  
D) array lists
1. A(n) ____________________ is a data structure used for collecting a sequence of objects that allows efficient addition and removal of elements in the middle of the sequence.

2. Rather than storing values in an array, a linked list uses a sequence of ________________.

3. You use a(n) ____________________ to access elements inside a linked list.

4. A linked list allows ________________ access, but you need to ask the list for an iterator.

5. The following code removes the first element of a linked list. Insert the missing statement.

    ```java
    public class LinkedList
    {
        public Object removeFirst()
        {
            if (first == null)
                throw new NoSuchElementException();
            Object obj = first.data;
            first = ____________________
            return obj;
        }
    }
    ```

6. A(n) ____________________ data type defines the fundamental operations on the data but does not specify an implementation.

7. An array list allows ________________ access to all elements.

8. A(n) ____________________ array is an ordered sequence of items with random access via an integer index.
9. A binary search requires ____________________ access.

10. A linear search requires ____________________ access.

11. The nodes of a(n) ____________________ linked list class store two links: one to the next element and one to the previous one.

12. A(n) ____________________ object stores an object and a reference to the next node.

13. When a new node is added to a linked list, it becomes the head of the list, and the node that was the old list head becomes its ____________________.

14. A(n) ____ lets you insert and remove elements at only one end.
   A) queue
   B) array
   C) list
   D) stack

15. A(n) ____ is a collection of items with "first in first out" retrieval.
   A) list
   B) queue
   C) array
   D) stack
16. The following code adds a node to the linked list. What is the missing statement?

```java
class LinkedList {
    ... 
    public void addFirst(Object obj) {
        Node newNode = new Node();
        newNode.data = obj;
        ____
        first = newNode;
    }
    ...
}
```

A) newNode = next;
B) newNode.next = first;
C) newNode = first;
D) newNode.first = next;

17. A(n) ____ is an ordered sequence of data items, each of which can be accessed by an integer index.
A) queue
B) stack
C) array list
D) iterator
Chapter 23

1. A(n) ____________________ is a program unit that is executed independently of other parts of the program.

2. The ____________________ method of the Thread class starts a new thread that executes the run method of the associated Runnable object.

3. The ____________________ method puts the current thread to sleep for a given number of milliseconds.

4. When a thread is interrupted, the most common response is to terminate the ____________________ method.

5. When a sleeping thread is interrupted, a(n) ____________________ is generated.

6. To start a thread, you should first construct an object from a class that implements the ____________________ interface.

7. Insert the statement that would start the following thread.

   Thread firstThread = new Thread(myRunnable);
   ____________________

8. Each thread runs for a short amount of time, called a(n) ____________________.

9. A thread terminates when the ____________________ method of its Runnable terminates.

10. Insert the missing statement which notifies the following thread that it should clean up and terminate.

    Thread firstThread = new Thread(myRunnable);
    ____________________

11. When a thread that is already interrupted calls the sleep method it is terminated with a(n) ____________________. 
12. ____ occur if the effect of multiple threads on shared data depends on the order in which the threads are scheduled.
   A) Pooling
   B) Interrupted exceptions
   C) Deadlocks
   D) Race conditions

13. A(n) ____ object is used to control the threads that want to manipulate a shared resource.
   A) condition
   B) lock
   C) interrupt
   D) runnable

14. A(n) ___________________ occurs if no thread can proceed because each thread is waiting for another to some work first.

15. ____ allow a thread to temporarily release a lock, so that another thread can proceed, and to regain the lock at a later time.
   A) Condition objects
   B) Embedded systems
   C) Exceptions
   D) Race conditions

16. Calling **await** on a condition object makes the current thread wait and allows another thread to acquire the ____ object.
   A) runnable
   B) condition
   C) lock
   D) resource

17. A waiting thread is blocked until another thread calls ____ on the condition object for which the thread is waiting.
   A) await
   B) signalAll
   C) interrupt
   D) lock
18. Which of the following statements is correct?
   A) If a thread sleeps after acquiring a lock, it blocks all other threads that want to use the same lock.
   B) When a thread calls `await`, it is simply deactivated in the same way as a thread that reaches the end of its time slice.
   C) A thread pool is designed to encapsulate the concept of a sequence of statements that can run in parallel with other tasks, without equating it with the concept of a thread, a potentially expensive resource that is managed by the operating system.
   D) Under no circumstances should you terminate a running thread.

19. In the initial release of the Java library, the Thread class had a `stop` method to terminate a thread. However, that method is now ________________ — computer scientists have found that stopping a thread can lead to dangerous situations when multiple threads share objects.

20. The thread that calls `signalAll` must own the lock that belongs to the condition object on which `signalAll` is called. Otherwise, a(n) ________________ is thrown.
1. The ________________ is a worldwide collection of networks, routing equipment, and computers using a common set of protocols to define how each party will interact with each other.

2. Two kinds of data are transmitted between computers: ________________ refers to the data that one computer actually wants to send to another. Network protocol data is the data that describe how to reach the intended recipient and how to check for errors and data loss in the transmission.

3. The term ________________ data refers to the data that describe how to reach the intended recipient and how to check for errors and data loss in the transmission.

4. The numbers 130.65.86.66 denote a(n) ________________.

5. cs.sjsu.edu is an example of a(n) ________________.

6. The ________________ translates domain names into Internet addresses.

7. IP breaks up large chunks of data into more manageable ________________.

8. The ________________ has one function, to attempt to deliver data from one computer to another across the Internet.

9. ________________ attempts reliable delivery of data, with retries if there are failures. It also notifies the sender whether or not the attempt succeeded.

10. A port number is an integer between 0 and ________________.

11. _____ is the protocol that defines communication between Web browsers and Web servers.
    A) TCP
    B) HTML
    C) HTTP
    D) IP
12. A(n) ____ describes how data for a particular application is transmitted.
   A) URL  
   B) application protocol  
   C) socket  
   D) IP address

13. A(n) ____ is a pointer to an information resource on the World Wide Web.
   A) URL  
   B) socket  
   C) IP address  
   D) domain name

14. The ____ program is a useful tool to establish test connections with servers.
   A) DNS  
   B) HTML  
   C) Telnet  
   D) TCP

15. The ____ protocol is used to download received messages from e-mail servers.
   A) SMTP  
   B) TCP  
   C) IP  
   D) POP

16. The HTTP _____________________ command requests information from a Web server.

17. A(n) ____ is used to listen to incoming connections.
   A) URL  
   B) packet  
   C) DNS  
   D) server socket

18. A(n) ____ is an object that encapsulates a TCP connection.
   A) URLConnection  
   B) protocol  
   C) socket  
   D) input stream
19. The ____ class makes it easy to communicate with a Web server without having to issue HTTP commands.
   A) TCP  
   B) URLConnection  
   C) Socket  
   D) HTTPConnection

20. Each IP ____ is delivered separately, and each one that is a part of the same transmission can take different routes through the Internet.
   A) packet  
   B) socket  
   C) address  
   D) port number