

Unit 3: Exception Handling & Multithreading

Descriptive Questions (4 Marks Each)

1. Write a program to demonstrate the use of try and catch statement in handling division by zero exception.
2. What is a nested try statement? Write a program to show its working.
3. Explain the use of throws keyword with an example program.
4. Write a program to demonstrate the use of finally block in exception handling.
5. What are built-in exceptions in Java? Explain with two examples.
6. Define user-defined exception. Write a program to create and use a custom exception.
7. Write a program to create a thread by extending the Thread class.
8. Write a program to create a thread by implementing the Runnable interface.
9. Explain the life cycle of a thread with a neat diagram and explanation.
10. What is the purpose of the wait() and notify() methods? Demonstrate with a program.
11. Write a program to show the use of suspend() and resume() methods in thread execution.
12. Explain the stop() method in Java threads with an example. Why is it deprecated?
13. Explain thread priority in Java. Write a program to assign priorities to threads.
14. Explain thread synchronization. Write a program to demonstrate synchronized methods.
15. Write a program to demonstrate synchronized block in Java.
16. Explain inter-thread communication in Java with the help of wait(), notify(), and notifyAll().
17. Define deadlock in multithreading. Write a program to create a deadlock situation.
18. Explain techniques to avoid deadlock in Java multithreading.
19. Write a program to create 2 threads such that one thread will print numbers from 1 to 10 & other reads numbers from 10 to 1. First thread should transfer control to second thread after printing second number.
20. Write a program to create 2 threads such that one thread will print odd numbers and the other thread will print even numbers from 1 to 20.
21. Write a program to create 2 threads such that one thread will print numbers from 10 to 20 & other reads numbers from 20 to 1. First thread should transfer control to second thread after printing second number. (Use sleep() method).
22. Write a program to catch an error when divide by zero situation occurs in a program.
23. Write a program to catch an error when array index goes out of given size of an array.
24. Write a program to accept password from the user and throw 'Authentication Failure!' exception if the password is incorrect.
25. Write a program to accept a number from the user and throw an exception if the number is not even.
26. Explain the following keyword
 1. try
 2. catch
 3. finally
 4. synchronised
27. Find error from below code, list it and then write corrected code.

```
public class ErrorDemo {public static void main(String[] args) { String s1 =
newString("MIT WPU");
String s2 = new String("mit WPU");
    if (s1 == s2) {
        System.out.println("The strings are equal.");
    } else {
        System.out.println("The strings are not equal.");
    }
}
```

Short Questions (2 Marks Each)

1. Define exception in Java.
2. Write the general syntax of try-catch block.
3. What is the use of the finally block in exception handling?
4. Differentiate between throw and throws keywords.
5. Write the syntax to create a user-defined exception class.
6. Write the syntax to create a thread using Runnable interface.
7. List the different thread states in Java.
8. Write the syntax of the sleep() method.
9. Define synchronization in Java.
10. Find the output of the program below.

```
class A {  
    A() {  
        System.out.println("A constructor");  
        call();  
    }  
    void call() {  
        System.out.println("A call");  
    }  
}  
class B extends A {  
    B() {  
        System.out.println("B constructor");  
    }  
    void call() {  
        System.out.println("B call");  
    }  
}  
class Test {  
    public static void main(String[] args) {  
        new B();  
    }  
}
```