Course No: ESGD4115
Course Title: Concurrent and real-time programming
Date: 17/11/ 2011
No. of Questions: 4
Time: 1 hr
Using Calculator (No)

University of Palestine

Midterm Exam
Fall term 2011/2012
Total Grade: 30

Instructor: Eng. Wisam Zaqoot
Student No.: _____
Student Name: _____
College Name: Eng. College
Dep. / Specialist: Software Engineering

First Question (8)

For each of the following statements state whether it is true or false:

1. In general, real-time systems are by their nature concurrent. ( )
2. In Java, priorities given to threads are also imposed on the underlying scheduler when allocating resources. ( )
3. In Distributed Processing, processes execute on several processors that share the same memory. ( )
4. A relative delay allows a thread to wait for a specified amount time. ( )
5. **Firm real-time** systems are more restrictive than **hard real-time** systems. ( )
6. If the created thread is not added to a thread group then it is not a member of any thread-group. ( )
7. Nonsynchronized methods can not be accessed by more than one thread at the same moment. ( )
8. Fibers use co-operative multitasking while threads use pre-emptive multitasking ( )
9. Deadlock may occur where each concurrent activity is waiting for another to perform an operation. ( )
10. Java threads that are mapped to OS threads are called Native Threads. ( )
11. The run method calls the start method when executed. ( )
12. Monitor is an object where at each point in time, at most one thread may be executing any of its methods. ( )
13. Terminating a thread by a stop method gives the thread no chance to clean up. ( )
14. If the run method is called explicitly, its code will be executed sequentially not concurrently. ( )
15. The wait method always blocks the calling thread and releases the lock associated with the object. ( )
16. Entry and exit protocols can be used to solve a lot of concurrency control problems. ( )

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Second Question (6)

Choose the right answer:

1) In soft real-time systems:

a) it is absolutely important that responses occur within the specified deadline

b) Response times are not important and there are no explicit deadlines.

c) Response times are important, but the system will still function correctly if deadlines are missed.

d) b and c

2) To allow mutually exclusive access to static data:

(a) The class object lock must be obtained when accessing static data.

(b) Data is accessed through a static method with the synchronized modifier only.

(c) The class object is identified in a synchronized block statement.

(d) a, b or c can be applied.

3) **InterruptedException** is thrown if:

a) A waiting thread is awoken by another thread interrupting it.

b) A wait method is called without holding the lock.

c) The interrupting thread does not have the appropriate security permissions.

d) a and b

4) Which of the following methods are now deprecated:

a) stop

b) suspend

c) resume

d) all the above

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Third Question (9)

1. Define the **concurrent program**:
2. Define the **real-time system**:
3. What are the main motives to use concurrent programming?
4. What are the main states of the thread?
5. What is holdsLock method used for?
6. Java priority models are weak, illustrate that:

Fourth Question (7)

1. Write a program of a class called Engine that extends Thread class. Define a constructor that takes the name of the engine as a string. Define a synchronized method in the class called moveForward that prints something. In the main method, create 3 objects of that thread and run them. Make the first engine to wait for 2.5 seconds.

2. Repeat the previous program using the Runnable interface and synchronize the portion of code inside the moveForward method.

Good Luck