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| **KING SAUD UNIVERSITY**  **COLLEGE OF COMPUTER AND INFORMATION SCIENCES Computer Science Department** | | |
| **CSC 227: Operating System** | **Tutorial# 8**  **Due: Sun, 30 April (12-1)** | **2nd Semester 1437-1438**  **Spring 2017** |

**Question#1:**

*Select (T) for true or (F) for False.*

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|  | True/False | | Statement |
| 1 | T | **F** | Multithreading is not suitable for client server architecture. |
| 2 | T | **F** | All threads that belong to a process are sharing the same stack. |
| 3 | **T** | F | Usually threads require less resources than processes. |
| 4 | T | **F** | Once a thread is blocked, other threads within the same task will also be blocked. |
| 5 | **T** | F | Responsiveness means if one thread stops the other threads will continue. |
| 6 | T | **F** | Parallelism is achieved in a single-core while concurrency is achieved in a multi-core system. |
| 7 | **T** | F | In Many-to-one multithreading model, many user-level threads are mapped to single kernel thread. |
| 8 | T | **F** | In Many-to-one multithreading model, when a ULT is blocked, all other threads will continue. |
| 9 | **T** | F | In one-to-one multithreading model, each user-level thread maps to a kernel thread. |
| 10 | T | **F** | Multithreading is implemented in the user space for Win32 thread library. |

**Question#2:**

*Circle ALL correct answers. Note that there might be multiple correct answers; also, there might be no correct answer.*

1. Which of the following is true about lightweight processes (LWPs):
2. LWP runs in kernel space on top of a single kernel thread
3. The creation of a thread does include directly the creation of a LWP
4. Each process contains one or more LWP, each of which runs one or more user threads
5. Which of the following are properties of one-to-one multithreading architecture:
6. When a thread of a process Pi is blocked, other threads of Pi can run
7. Multiple threads of a process Pi can run simultaneously on multicores
8. When a thread of a process Pi is blocked, other threads of Pi can’t run
9. Multiple threads of a process Pi can’t run simultaneously on multicores
10. In general, the advantages of having user-level threads include:
11. The operating system is not invoked in thread switching
12. Blocking the rest of threads is totally avoided
13. Threads can always run on multicores
14. In two-level multithreading architecture you may find:
15. The one-to-one architecture
16. The many-to-many architecture
17. The many-to-one architecture
18. Which of the following is true about kernel-level threads:
19. They are generally faster to create and manage than user-level threads
20. The implementation is conducted by a thread library at the user level
21. They are generic and can run on any operating system
22. Transfer of control from one thread to another within the same process requires a mode switch to the Kernel