EE458 - Real Time Programming
HW 5

References:
   RTC Chapters 7-8
   CUG Chapter 10-12

Where appropriate, give specific RTEMS directives and lines of code.
Please type all responses. Hand written work will not be accepted.

1. What data structures are typically used by a message queue? What does each structure represent?
2. What normally happens when a task tries to send a message to a full queue?
3. What normally happens when a task tries to receive a message from an empty queue?
4. What types of data can be sent via a message queue?
5. What are the advantages/disadvantages of allocating queue memory from a system pool versus using private buffers?
6. How do you create an RTEMS queue in which messages are posted in LIFO order and receive tasks are dequeued from the receive task wait list in order of priority?
7. Write RTEMS code that illustrates how to check whether a message is available in the queue before a request is made to receive the message. How can you ensure that the message is still in the queue between the check for availability and the actual message reception?
8. If you use the RTEMS queue receive directive with the RTEMS_NO_WAIT option how can you determine whether or not a message is returned in the buffer argument?
9. What are the advantages/disadvantages of using signals for task synchronization instead of semaphores?
10. In RTEMS, how do you configure the number of event registers used by your application? How do you configure the number of event flags per register?
11. List RTEMS code for polling the current event set.
12. List RTEMS code for clearing the current set of events.
13. In RTEMS how do you configure the number of signal handlers (ASRs) used by your application? How do you configure the number of signals that a task can receive?
14. What are the differences between signals and events?
15. What special property must your ASR have if ASR processing is enabled during execution of your ASR? Why?
16. Assume your task expects to receive only signals RTEMS_SIGNAL_0 and RTEMS_SIGNAL_1. Routine signal0() should be called if signal 0 is received and signal1() should be called if signal 1 is received. List RTEMS code for the appropriate signal handler. Also list RTEMS code for installing the handler.