**NAME**: Shaydon Bodemar

Rename the completed Word document to *yourlastname\_Q5.docx* before emailing it to [tlupfer@sandiego.edu](mailto:tlupfer@sandiego.edu). In other words, my quiz would be named *lupfer\_Q5.docx*.

This is a closed-book, off-grid (no Internet searches) quiz. You have 15 minutes to complete it.

**Reminder**: USD Honor Code: [www.sandiego.edu/conduct/documents/HonorCode.pdf](http://www.sandiego.edu/conduct/documents/HonorCode.pdf)

**All questions are worth 10 points (10 x 10 = 100 points total)**

Describe the functionality a queue provides.

1. **Answer**: Allows data to be passed between functions being run by the scheduler.

What are the purposes of the three fundamental API functions needed to use queues in FreeRTOS? This is not asking for the exact function declarations, but the basic three operations.

1. **Answer**: Create the queue
2. **Answer**: Send the data/object to the back
3. **Answer**: Retrieve the data/object at the front

If you add an item to the back of the queue, what type of buffer is being implemented?

1. **Answer**: FIFO

If you add an item to the front of the queue, what type of buffer is being implemented?

1. **Answer**: LIFO

In FreeRTOS, is it possible to add some items to the front and some items to the back of a given queue?

1. **Answer**: Yes it is, thus allowing a LIFO or FIFO implementation

What is used to reference a specific queue when using queue functions in FreeRTOS?

1. **Answer**: The QueueHandle\_t object that was created/initialized prior to the start of the scheduler.

Describe the two parameters that must be specified when creating a queue in FreeRTOS.

1. **Answer**: The size of each object and the number of objects (basically enabling the correct memory allocation for the buffer)

If it is imperative that no items to be added to a queue are tossed out (lost), and the task that produces the items does not have to perform any other operations until the current item is added to the queue, circle the correct answer as to what should be done when adding an item to the queue:

1. **Answer**: Block indefinitely Do not block, keep trying if the queue is full

My thought process for this answer is that if the queue is full you can’t block because that task needs another function to remove something from the queue in order to be able to add it, so continually attempting to add to the queue allows another task to run.