Second Exam Study Sheet

The second exam is on Thursday, Dec. 6, in class. No notes, textbooks, electronic devices are allowed. The exam will focus on the topics covered in the course from Oct. 11 on including:

RRT path planners, Particle Filters, SLAM, Robotic Grasping, Computer Vision, OpenCV, Reinforcement Learning, Medical Robotics, Followbot autonomous driving, Brain Computer Interfaces, and ROS programming.

Some sample questions:

1. How do you subscribe to a camera image stream in ROS?
2. What is the difference between particle filter localization and particle filter SLAM?
3. What is Graph SLAM?
4. What is an eigen grasp?
5. What is Data Driven grasping?
6. The hand below has 3 fingers, each with two revolute joints. What is the configuration space of this robotic hand?

7. What is camera calibration? How is it done using the Direct Linear Transform (DLT) or “lumped” method?
8. How can I improve a sub-optimal RRT planned path?
9. How do you do color filtering?
10. What are three advantages of using robot’s in surgery?
11. What is Kinesthetic teaching of a robot?
12. What are three advantages of reinforcement learning in robotic tasks? Three disadvantages?
13. What is SSVEP? How does it work? (lecture on 12/4)
14. How would you program a followbot to recognize a dog walking across the yellow road and immediately stop?