Quiz Challange One: COMP417

Name :

Student Number: MARK:

Write down your answers on the right. Be brief.

Answer sheet **ALLANSWERS**

Q1: If a greedy algorithm is used for Global Localization, the competetive radio is roughly: (A) 2, (B) 200, (C) exponential in the number of hypotheses, (D) the sqaure of the number of cells in the state space, (E) optimal, (F) faster than the CPU speed?	A1: C) exponential
Q2: The term ROS refers to the Robot Operating System. What is it? A) An operating System, B) A computer vision package, C) A programming language, D) A collection of tools and libraries (middleware), E) None of the above?	A2: D) A collection of tools and libraries (middleware)
Q3: The particle filter has which of the following advantages over the Kalman Filter or ELK: A) It allow for estimation non-Gaussian probability densities, B) It allows for multi-modal predictions of the robot state, C) It can be used even without an analytical model of the kinematics (e.g. if only a simualtion is available), D) It needs resampling to work reliably, E) All of the above, F) None of the above, G) All but two of A-D ?	A3: E), all of the above
Q3: The term ROS refers to the Robot Operating System. What is it? A) An operating System, B) A computer vision package, C) A collection of tools and libraries (middleware), D) A programming language, E) A family of wheeled robots, F) None of the above?	A3: C) A collection of tools and libraries (middleware)
Q4: Ifa greedy algorithm is used for Global Localization, the competetive radio is roughly: (A) exponential in the number of hypotheses, (B) 2, (C) 200, (D) the sqaure of the number of cells in the state space, (E) optimal, (F) faster than the CPU speed?	A4: A) exponential

Q4: Regarding Extended Kalman filter, what does the extension refer to? (A) Running over longer time scales, (B), Running over larger spatial scales, (C) Running over configuration spaces with more complex topology, (D) Being able to use a non-linear model of sensing or kinematics?	A4: D) Being able to use a non-linear model of sensing or kinematics
Q5: The Kalman Filter is optimal under certain assumptions. In what sense is it optimal? A) In terms of the number of computations used? B) With respect to the numebr of lines of code needed for the algorithm? C) In terms of the number of iterations needed to converge. D) In terms of the accuracy of the estimated state ?	A5: Accuracy of the estimate
Q6: Define divergence of an EKF?	A6: Unbounded increase in the distance between the estimate and the actual state