Assignment 7

The due date for submitting this assignment has passed.
All per requirement records have not been submitted to this assignment.

1) Why is robotic assistance necessary for percutaneous needle insertion?
   - To improve the target reaching accuracy
   - To aid the physician
   - To avoid accidental fatalities
   - All of the above
   No, the answer is incorrect.
   Accepted Answers: None

2) Needle insertion for MINIKET robotic system developed in Thomas Jefferson University is
   - Manual
   - Augmented
   - Semi-Augmented
   - None of the above
   No, the answer is incorrect.
   Accepted Answers: Manual

3) What are the imaging feedback modalities used in robot-assisted percutaneous interventions?
   - CT
   - US
   - All of the above
   No, the answer is incorrect.
   Accepted Answers: CT

4) How many DOF, the active needle (Design-3) has
   - 6
   - 5
   - 4
   No, the answer is incorrect.
   Accepted Answers: 4

5) The expression of the control law utilized for feedback-linearization controller (LCL) is given by
   \[ \delta = \frac{\alpha \ddot{x} + b \dot{x}}{F} \]
   No, the answer is incorrect.
   Accepted Answers: True

6) During designing of the linear sliding surface, the chosen sliding parameter in equation below must be
   \[ \delta = \frac{6 \alpha + 6 \dot{x} + 6 \ddot{x}}{F(x, y, z)} \]
   No, the answer is incorrect.
   Accepted Answers: False

7) Choose True or False
   - Statement 1: The rigorous approach through the lyapunov stability analysis not only analyzes the stability but also aids to design the controller.
   - Statement 2: In order to successfully design the controller in conventional sliding mode control, the sliding variable must have the relative degree.
   - Statement 3: The two derivatives of sliding variable must be a function of control input in order to design the controller in conventional sliding mode control successfully.
   No, the answer is incorrect.
   Accepted Answers: True, True, False

8) The disturbance gain in our research study while controlling the SMA actuated active needles are
   - Disturbance from tissue heterogeneity and cooling
   - SMA hydromechanics and non-linearity
   - Air-driven disturbance in the SMA actuator and Load at the tip
   - None of the above
   No, the answer is incorrect.
   Accepted Answers: None

Due on 2020-03-16, 23:59 IST.