Week 1 - Assignment 1

The due date for submitting this assignment has passed. Due on 2021-02-03, 23:59 IST.

As per our records you have not submitted this assignment.
If not explained all symbols have same meaning as in the Lectures

1) The main features of a parallel robot is (are)  
   - the existence of at least one loop.  
   - no natural end-effector.  
   - the links are in parallel.  
   - the joints are in parallel.  

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: 
   the existence of at least one loop. 
   no natural end-effector.

2) The main advantage of using a stepper motor is (are)  
   - that it can be more compact than all other kinds of electric motors for the same power output.  
   - that it can give a much larger torque as compared to other electric motors of the same size.  
   - that the rotation errors do not accumulate and hence can be used in open loop.  
   - that it can be run at very high speeds.  

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: 
   that the rotation errors do not accumulate and hence can be used in open loop.
3) The link of a robot is 1 m long. It is driven by a DC servo motor with an encoder used to measure rotation at the joint. What should be the number of bits in the encoder if the desired accuracy in positioning the end of the link is 0.1 mm?

- 12 bit.
- 14 bit.
- 16 bit.
- 18 bit.

No, the answer is incorrect.
Score: 0
Accepted Answers:
16 bit.

4) Go to the link:
https://upload.wikimedia.org/wikipedia/commons/e/e9/16777216colors.png
(https://upload.wikimedia.org/wikipedia/commons/e/e9/16777216colors.png) and use this image to get the value of Red, Green, Blue at the pixel value (1561,1399). The value is nearby:

- R = 147, B = 007, G = 145.
- R = 097, B = 087, G = 248.
- R = 037, B = 177, G = 048.
- R = 217, B = 213, G = 067.

No, the answer is incorrect.
Score: 0
Accepted Answers:
R = 097, B = 087, G = 248.

5) In a DC motor driven using a PWM circuit

- the applied voltage is varied linearly.
- the applied voltage is kept at a constant value and the duty cycle is varied.
- the duty cycle can be varied between 0 and 100 %.
- The frequency of switching is kept very high ( > 20 kHz) so as not to cause audible noise.

No, the answer is incorrect.
Score: 0
Accepted Answers:
The applied voltage is kept at a constant value and the duty cycle is varied. The frequency of switching is kept very high ( > 20 kHz) so as not to cause audible noise.

6) Which of the following devices is used to measure the rotational speed

- Stroboscope.
- Tachometer.
- Encoder.
- Gyroscope

No, the answer is incorrect.
Score: 0
Accepted Answers:
Stroboscope.
Tachometer.

7) Which of the following devices is not a microprocessor

- Raspberry Pi 4.
8) Figure below shows the test result of a dart throwing robot. The blue `×` shows the darts thrown by the robot and the red circle is the intended target area. The conclusions that can be made about the robot is:

- the robot is precise but not accurate.
- the robot is precise and accurate.
- the robot is accurate but not precise.
- the robot is neither accurate nor precise.

No, the answer is incorrect.
Score: 0
Accepted Answers:
- the robot is precise but not accurate.
- Arduino Uno.

9) Which of the following are TRUE for rate gyro

- Output proportional to angular rotation speed.
- Can be integrated to obtain position.
- Can be differentiated to obtain linear acceleration.
- Cannot predict position or acceleration.

No, the answer is incorrect.
Score: 0
10) Let us say you want to design a low-cost automated hand sanitizer to battle COVID-19. Which of the following sensor will best suit the purpose:

- Camera.
- Touch sensor.
- LIDAR.
- Ultrasonic sensor.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Ultrasonic sensor.