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NPTEL

reviewer4@nptel.iitm.ac.in ▾

Courses » Electronic Modules for Industrial Applications using Op-Amps

Announcements **Course** Ask a Question Progress FAQ

Unit 5 - Sensors for measuring ETM properties of tissues, Experiment: DC Motor Speed Control using Op-amp (Part I)

Register for Certification exam

Course outline

How to access the portal

Introduction to Op-Amps

Experiment: Op-amp based ECG Signal Acquisition, Conditioning and Processing for Computation of BPM

Photolithography (Heart of Microengineering Process), Understanding Atrial Fibriallation, Catheter Ablation Procedure and Experiment on ECG Signal Conditioning

Sensors for measuring ETM properties of tissues,

Week 4 Assignment

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2019-03-27, 23:59 IST.**

1) What type of the encoder that has been used in this experiment? ***1 point***

- Absolute
- Referential

No, the answer is incorrect.
Score: 0

Accepted Answers:
Referential

2) What are the advantages of phase-quadrature encoders? ***1 point***

- Detect direction of rotation
- Four-fold increase in resolution
- Both a and b
- None of the mentioned

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both a and b

3) What does phase-quadrature indicate ***1 point***

- The pulses from channel B are shifted by 90 degrees out of phase with respect to channel A and vice versa
- The pulses from channel B are shifted by 180 degrees out of phase with respect to channel A and vice versa

The pulses from channel B are shifted by 90 degrees out of phase with respect to channel A and vice versa

4) The sensitivity of cantilever to _____ is determined by its flexibility **1 point**

- Surface tension
- Surface stress
- Surface Strain
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Surface stress

5) Select the correct option for driving a motor with PWM signal **1 point**

- The speed of the motor can be controlled from the output of microcontroller using driver circuit
- Since the coil is repeatedly switched ON and OFF, the heat generated in the coils of motor will be less
- The motor can be rotated much more slowly without it stalling.
- All the mentioned.

No, the answer is incorrect.
Score: 0

Accepted Answers:
All the mentioned.

6) For the circuit shown in the figure below, find out the current through R1 and R2. **1 point**
Note: V1 = 10 V; VCE = 0.3 V; op-amp supply voltage = +/- 15 V; VBE = 0.7 V; β = 99

- 5 mA and 0.5 A
- 1 mA and 1 A
- 10 mA and 0.1 A
- 50 mA and 0.5 A

No, the answer is incorrect.
Score: 0

Accepted Answers:
5 mA and 0.5 A

7) For the circuit shown in question 6, find the output voltage of the op-amp **1 point**

- 14.3 V
- -14.3 V
- 0 V
- 2.1 V

No, the answer is incorrect.
Score: 0

Accepted Answers:
2.1 V

8) For the circuit shown in question 6, find the voltage drop across collector-emitter junction of the transistor. **1 point**

- 0.7 V
- 9.5 V
- 10 V
- 0 V

No, the answer is incorrect.
Score: 0

Accepted Answers:
9.5 V

9) In the fabrication of micro heater that is discussed in the video lectures, Low power consumption is due to _____ structure **1 point**

- Diagonal
- Rectangle
- Diaphragm
- Square

No, the answer is incorrect.
Score: 0

Accepted Answers:
Diaphragm

10) A micro-heater is fabricated on silicon wafer followed by deposition of insulation layer. A metal layer is deposited and is patterned to get IDE structure. The fabrication process of this device is a _____ mask process. **1 point**

- One
- Two
- Three
- It is user dependent and cannot be predicted

No, the answer is incorrect.
Score: 0

Accepted Answers:
Three

11) Which of the following is true in case of anisotropic etching **1 point**

- It aims to remove a material in specific directions to obtain flat shapes
- It is achieved through reactive ion etching process(RIE)
- It is used to produce sharp corners
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

12) Suppose if the user has to control the RPM of the motor at 90 RPM, what is the set voltage to be provided for the system if the scaling factor is 20 RPM/1V. **1 point**

- 4.5 V

- 5 V
- 0.5 V
- 2.5 V

No, the answer is incorrect.
Score: 0

Accepted Answers:
4.5 V

13) Error detector finds the difference between setpoint and feedback signal. Select a suitable op-amp configuration to match the requirement of the error detector. **1 point**

- Inverting amplifier
- Non-inverting amplifier
- Difference amplifier
- Voltage follower

No, the answer is incorrect.
Score: 0

Accepted Answers:
Difference amplifier

14) _____ plays a key role in the yield of lithography process **1 point**

- Ambient humidity
- Ambient temperature
- Ambient pressure
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Ambient humidity

15) Which of the following is true in case of DRIE etching **1 point**

- DRIE process creates less penetration in wafers/substrates
- DRIE process creates low aspect ratio structures
- DRIE gives sharp anisotropy feature
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
DRIE gives sharp anisotropy feature

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