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NPTEL

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Courses » Electronic Modules for Industrial Applications using Op-Amps

Announcements Course Ask a Question Progress FAQ

Unit 4 - Photolithography (Heart of Microengineering Process), Understanding Atrial Fibrillation, Catheter Ablation Procedure and Experiment on ECG Signal Conditioning

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
Fibrillation,
Catheter
Ablation
Procedure and
Experiment on
ECG Signal
Conditioning

Design and
Implementation
of Deck

Week 3 Assignment

The due date for submitting this assignment has passed.

As per our records you have not submitted this **Due on 2019-03-20, 23:59 IST.**
assignment.

1) Consider a half wave rectifier shown in figure below. What is the **1 point**
minimum input voltage (V_{in}) required for the diode to conduct?

Note: The forward voltage of diode is 0.7 V and the open loop gain of op-amp
is 10^4

- 0.7 V
 1 V
 70 μ V
 0 V

No, the answer is incorrect.

Score: 0

Accepted Answers:
70 μ V

2) For the circuit shown in question 1, consider V_{in} is connected to 5 V **1 point**
DC. Compute the relation between V_{oa} and V_o

- $V_{oa} = V_o$
 $V_o < V_{oa}$
 $V_o > V_{oa}$
 None of the mentioned

No, the answer is incorrect.

Score: 0

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Demonstration of ECG Signal Acquisition, Conditioning and Measurement of BPM

Application: ECG Signals for detecting AF and the role of sensors

Photolithography: Masks

Understanding the process of photolithography

Photolithography: Mask Aligner

Photolithography: Designing of Mask Aligner System

Quiz : Week 3 Assignment

Week 3 Assignment Solution

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

Experiment on DC Motor Speed Control using Op-amp (Part II)

DC Speed Control using DAQ and Introduction to Hot-Wire Anemometer

Introduction to Gas Sensors and Experiment on Signalconditioning Circuit for Operating Heater Voltage of MQ-7 Gas Sensor

Electrophysiological Recordings from the Human Body

- An All-pass filter
- A Band-pass filter
- A High-pass filter

No, the answer is incorrect.

Score: 0

Accepted Answers:
An All-pass filter

4) _____ can be used to measure force.

1 point

- Strain gauges
- Bellows
- Bourdon gauges
- All of these

No, the answer is incorrect.

Score: 0

Accepted Answers:
Strain gauges

5) Strain gauge is a _____ device that converts _____ into _____.

1 point

- Active; electrical signal; change of resistance
- Passive; electrical signal; change of resistance
- Active; mechanical displacement; change of resistance
- Passive; mechanical displacement; change of resistance

No, the answer is incorrect.

Score: 0

Accepted Answers:
Passive; mechanical displacement; change of resistance

6) PDMS is bonded to glass wafer by

1 point

- Plasma Bonding
- Anodic Bonding
- Using double sided adhesive
- Thermocompression

No, the answer is incorrect.

Score: 0

Accepted Answers:
Plasma Bonding

7) Consider the circuit shown in figure below. Compute the output waveform for an input of 5kHz

1 point

-
-
-
- None of the mentioned

No, the answer is incorrect.

Score: 0

Accepted Answers:

and its
Applications,
Experiment
using Data
Acquisition
device and
simulation of
MEMS sensors

Interaction
Session

8) For mixed ambient growth kinetics of wet oxidation process, which of **1 point** the following is correct?

- Substrate doping can affect growth kinetics at lower temperature
- Rate depends on partial pressure of particular oxidant
- It depends on substrate orientation
- All of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

All of these

9) Mask aligner is used to:

- I. Alignment of wafer to mask
- II. Coat photoresist on wafer
- III. Expose the coated wafer
- IV. Developing the pattern, printed on wafer

- I, II
- II, III
- I, III
- III, IV

No, the answer is incorrect.

Score: 0

Accepted Answers:

I, III

10) Determine the roll-off for the filter circuit shown below

- 40 dB/decade
- 60 dB/decade
- 20 dB/decade
- 80 dB/decade

No, the answer is incorrect.

Score: 0

Accepted Answers:

20 dB/decade

11) Consider the circuit shown in the figure below. If input $V_1 = 3$ Vp-p sine wave, compute the output voltage of the op-amp U2

- 3 Vp-p Sine wave
- 1.5 Vp-p sine wave
- 3 V DC
- 1.5 V DC

No, the answer is incorrect.

Score: 0

Accepted Answers:

1.5 V DC

12) For the circuit shown in the question 10, select the correct operation of the circuit

- Simple low pass filter
- Half-wave rectifier with filter
- Full-wave rectifier with filter
- Peak detector

No, the answer is incorrect.

Score: 0

Accepted Answers:

Peak detector

13) In ion-assisted etching process, CHF₃ is used in:

1 point

- Dry etching of silicon dioxide
- Dry etching of silicon nitride
- Wet etching of silicon dioxide
- Dry etching of silicon dioxide and silicon nitride

No, the answer is incorrect.

Score: 0

Accepted Answers:

Dry etching of silicon dioxide and silicon nitride

14) Which of the below statements are correct:

1 point

- i. Dry oxidation is about 5 times faster than wet oxidation
- ii. Dry oxidation is mainly used for creating thin oxide layers and wet oxidation for thicker ones
- iii. Dry oxidation is used for making field oxide layers and wet oxidation for gate oxides
- iv. Dry oxidation gives better quality oxide layers as compared to wet oxidation

- i, ii, iii, and iv
- ii and iv
- ii, iii and iv
- i, ii, and iv

No, the answer is incorrect.

Score: 0

Accepted Answers:

ii and iv

15) Which of the following is false?

1 point

- Contact mode lithography gives better resolution than other two modes
- In contact mode lithography the mask may get contaminated by photoresist.
- Effect of diffraction of light is minimum for contact mode lithography.
- Contact mode lithography is not efficient for batch production.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Contact mode lithography gives better resolution than other two modes

16) Consider the circuit shown in figure below, compute the output voltage of U₂ op-amp at t = 0.5s

1 point

Note: Consider the op-amp is supplied with ± 15 V

- 10 V
- 20 V
- 15 V
- 15 V

No, the answer is incorrect.

Score: 0

Accepted Answers:

10 V



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