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

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

- Introduction to ECG Experiment
- Design and Implementation of ECG Preprocessing Stage: Part 1
- Design and Implementation of ECG Preprocessing Stage: Part 2
- Design and Implementation of ECG Preprocessing

Week 2 Assignment

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-03-13, 23:59 IST.

1) What is the frequency range of ECG signal? ***1 point***

- 0.05 Hz – 150 Hz
- 500 Hz – 1200 Hz
- 5 kHz – 10 kHz
- 0.5 Hz – 1 MHz

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.05 Hz – 150 Hz

2) How do you reduce the hum noise generated by the power supply in the ECG circuit? ***1 point***

- By implementing band pass filters
- By implementing high pass filters
- By implementing notch filters
- By implementing low pass filters

No, the answer is incorrect.
Score: 0

Accepted Answers:
By implementing notch filters

3) Which of the following op-amp circuit is employed to reduce the base line wandering? ***1 point***

Score: 0

Accepted Answers:
High Pass Filter

4) What is the importance of having an instrumentation amplifier at the first stage? ***1 point***

- To minimize the loading effect
- To measure the differential signal with high accuracy
- To amplify the input signals
- All the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All the above

5) Power line interference is caused due to ***1 point***

- Nearby machines operating with AC
- Working with DC components
- Movement or electrical activity during measurement
- None of the mentioned

No, the answer is incorrect.
Score: 0

Accepted Answers:
Nearby machines operating with AC

6) Change in electrode position during the acquisition or measurement causes _____ ***1 point***

- Increase in the amplitude of the signal
- Decrease in the amplitude of the signal
- Change in the base line of the signal
- Change in the signal phase by 180

No, the answer is incorrect.
Score: 0

Accepted Answers:
Change in the base line of the signal

7) What is the effect of motion artifacts ***1 point***

- Changes the rate of acquisition
- Changes the electrode skin position
- Increases the amplitude of the signal
- Decreases the amplitude of the signal

No, the answer is incorrect.
Score: 0

Accepted Answers:
Changes the electrode skin position

8) How to compute the heart rate from ECG signal? ***1 point***

- By detection and measurement of QRS complexes

- By measuring the occurrence of P wave in the ECG signal
- By measurement of maximum amplitude of ECG signal
- None of the mentioned

No, the answer is incorrect.
Score: 0

Accepted Answers:
By detection and measurement of QRS complexes

9) What is the cause of base line wandering **1 point**

- Respiration and body movement
- Improper contact of electrode and the skin
- Interference due to nearby machines operating with AC
- None of the mentioned

No, the answer is incorrect.
Score: 0

Accepted Answers:
Respiration and body movement

10) How to measure - 3dB line practically for determining the cut-off frequency of a filter? **1 point**

- The frequency at which the output voltage increases to 0.707 times of maximum input amplitude
- The frequency at which the output voltage decreases to 0.707 times of maximum input amplitude
- The frequency at which the output and input voltage amplitude matches
- None of the mentioned

No, the answer is incorrect.
Score: 0

Accepted Answers:
The frequency at which the output voltage decreases to 0.707 times of maximum input amplitude

11) Why passive filters are not preferable? **1 point**

- Inductors become large at low frequencies and expensive
- The passive filters can cause loading of the source
- Series resistance of inductors degrade its performance
- All of the mentioned

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the mentioned

12) Consider the circuit shown in the figure below. Let the input Vi connected is a sinusoidal input of 2 Vpp and the opamp1 is powered with ± 15 V. What is the operation of the circuit **1 point**

- Half wave rectifies the input Vi

- Integrates the input voltage Vi
- Differentiates the input voltage Vi
- Produces single pulses at the zero-crossing point in every cycle

No, the answer is incorrect.
Score: 0

Accepted Answers:
Produces single pulses at the zero-crossing point in every cycle

13) For the circuit shown in question 12, what is the configuration of Opamp1 **1 point**

- Inverting configuration
- Schmitt trigger
- Zero crossing detector
- Differentiator

No, the answer is incorrect.
Score: 0

Accepted Answers:
Zero crossing detector

14) For the circuit shown in figure 12 select the V' output signal **1 point**

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-
-
-

No, the answer is incorrect.
Score: 0

Accepted Answers:

15) Consider the circuit shown below. If the capacitor C is initially uncharged and at t = 0 the switch is closed, compute the voltage across the capacitor at t = 10 ms **1 point**

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

- 15 V
- 10 V
- 6.3 V
- -15 V

No, the answer is incorrect.
Score: 0

Accepted Answers:
10 V

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