Unit 2 - Introduction to Op-Amps

Week 1 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) The input impedance of an op-amp is higher for

- Inverting Amplifier
- Difference Amplifier
- Voltage Follower
- None of the mentioned

No, the answer is incorrect.
Score: 0
Accepted Answers: Voltage Follower

2) If a sine wave is given as input to the circuit shown, then the output will be

- Triangular Wave
- Square Wave
- Half wave rectified sine wave
- Full wave rectified sine wave

No, the answer is incorrect.
Score: 0
Accepted Answers: Square Wave

3) Let us consider an op-amp having a slew rate of 3V/μS. Compute an undistorted peak-peak output voltage for an input sine wave of 2 MHz frequency

Score: 0
Accepted Answers: Square Wave
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

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 Signal conditioning Circuit for Operating Heater Voltage of MQ-7 Gas Sensor

Electrophysiological Recordings from the Human Body and its Applications, Experiment using Data Acquisition device and simulation of MEMS sensors

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4) Consider an op-amp with input offset voltage of 10 mV. Given $R_1 = 2\, \text{k}\Omega$ and $R_2 = 6\, \text{M}\Omega$, then calculate the output voltage $V_{out}$.

- 30 V
- 0 V
- ± 10 mV
- - 0.5 V

No, the answer is incorrect.

Accepted Answers:
- 0.477 V

5) Select the correct op-amp when working with high input source resistance

- Op-amp with low bias current
- Op-amp with higher slew rate
- Buffer or voltage follower
- All the mentioned

No, the answer is incorrect.

Accepted Answers:
- All the mentioned

6) Consider $R_1 = 1\, \text{k}\Omega$, $R_2 = 2\, \text{k}\Omega$, $R_3 = 4\, \text{k}\Omega$, $R_f = 8\, \text{k}\Omega$, $V_1 = 4\, \text{V}$, $V_2 = 2\, \text{V}$ and $V_3 = 1\, \text{V}$ respectively. Compute the output voltage $V_0$ for the circuit shown

- - 42 V
- 42 V
- 22 V
- - 22 V

No, the answer is incorrect.

Accepted Answers:
- - 42 V

7) Which is the necessary condition of gain while designing Wien bridge oscillator to ensure the sustained oscillations?

- $A \geq 29$
- $A \geq 3$
- $A \geq 1$
- None of the options

No, the answer is incorrect.

Accepted Answers:
8) A tuned amplifier has peak output at 3 MHz and quality factor 40. The bandwidth and 3-dB frequencies shall be at what values respectively?

- 75 kHz, 3.04 MHz, 2.96 MHz
- 75 kHz, 2.04 MHz, 1.96 MHz
- 800 kHz, 3.04 MHz, 1.96 MHz
- 80 kHz, 2.08 MHz, 1.92 MHz

No, the answer is incorrect.
Score: 0
Accepted Answers: 75 kHz, 3.04 MHz, 2.96 MHz

9) Given $V_i = 5 \sin \omega t$, $C_1 = 30 \text{ nF}$, $C_2 = 10 \text{ nF}$, $R_1 = 20 \text{ kΩ}$ and $R_2 = 10 \text{ kΩ}$. Calculate the lower cut-off frequency ($\omega_L$) and higher cut-off frequency ($\omega_H$)

- $\omega_H = 1 \text{ kHz}$ and $\omega_L = 10 \text{ kHz}$
- $\omega_L = 1.67 \text{ kHz}$ and $\omega_H = 10 \text{ kHz}$
- $\omega_L = 3.7 \text{ kHz}$ and $\omega_H = 100 \text{ kHz}$
- $\omega_H = 2.04 \text{ kHz}$ and $\omega_L = 1 \text{ kHz}$

No, the answer is incorrect.
Score: 0
Accepted Answers: $\omega_L = 1.67 \text{ kHz}$ and $\omega_H = 10 \text{ kHz}$

10) Select the correct option for a phase shift oscillator

- A phase shift oscillator uses a voltage follower as an amplifier with a phase shifting network
- It can be constructed only with op-amps
- Op-amp with any gain and a feedback phase shifting network is enough to act as a phase shift oscillator
- None of the mentioned

No, the answer is incorrect.
Score: 0
Accepted Answers: None of the mentioned

11) What will be the output of a difference op-amp when the voltages connected to the both input terminals are same?

- The output will be zero
- The output voltage will be saturated
- The output voltage will be nearly equal to zero but not zero
- None of the mentioned

No, the answer is incorrect.
Score: 0
Accepted Answers: The output voltage will be nearly equal to zero but not zero

12) Which oscillator uses two inductors and 1 capacitor in the tank circuit?
Given the stages of the op-amp, arrange them in an appropriate order. Consider the flow from input stage to output stage.

1. Differential amplifier stage
2. Level shifting stage
3. Impedance matching stage
4. Voltage gain stage

- 1, 4, 2, 3
- 1, 2, 3, 4
- 2, 1, 4, 3
- 4, 3, 2, 1

No, the answer is incorrect.

Score: 0

Accepted Answers:

14 Calculate the maximum output voltage of an op-amp shown below, if the op-amp has Vos = 10 mV and IB = 300 nA.

- 0 mV
- 55 mV
- 220 mV
- 110 mV

No, the answer is incorrect.

Score: 0

Accepted Answers:

15 Calculate the maximum output voltage of an op-amp for the circuit shown in Question 14, if the op-amp has Vos = 10 mV, IB = 300 nA and input offset current (IOS) = 55 nA.

- 0 mV
- 110.55 mV
- 110 mV
- 0.12 mV

No, the answer is incorrect.

Score: 0

Accepted Answers: