



قائمة الاسئلة

الالكترونيات حيوية - كلية الهندسة - قسم الطبية الحيوية- المستوى الثالث - 3 ساعات - درجة هذا الاختبار (50)

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- 1) The quality factor (Q) in a Band-Pass Filter determines its bandwidth.
  - 1)  True.
  - 2)  FALSE.
- 2) Negative feedback in an Op-Amp circuit increases voltage gain.
  - 1)  True.
  - 2)  FALSE.
- 3) In a voltage-follower configuration, the gain is zero.
  - 1)  True.
  - 2)  FALSE.
- 4) An ideal Op-Amp has low input impedance and high output impedance.
  - 1)  True.
  - 2)  FALSE.
- 5) A comparator has a continuous output that varies proportionally to the input difference.
  - 1)  True.
  - 2)  FALSE.
- 6) A differential amplifier is used in biomedical signal acquisition because of its high common-mode noise rejection.
  - 1)  True.
  - 2)  FALSE.
- 7) A Band-Stop Filter allows only signals within a specific frequency range to pass while rejecting all others.
  - 1)  True.
  - 2)  FALSE.
- 8) A differential amplifier is used in ECG signal acquisition because it amplifies the difference between two input signals while rejecting noise.
  - 1)  True.
  - 2)  FALSE.
- 9) In optical isolation, an electrical signal is converted to a light signal using an LED.
  - 1)  True.
  - 2)  FALSE.
- 10) Electrical insulation in ECG amplifiers introduces high impedance to limit leakage current between the patient and monitoring instruments.
  - 1)  True.
  - 2)  FALSE.
- 11) In a single-ended differential mode operation, the input is applied:
  - 1)  To both inputs equally
  - 2)  To the inverting input while the noninverting input is grounded
  - 3)  To the noninverting input while the inverting input is grounded
  - 4)  Across the power supply
- 12) Negative feedback in an op-amp circuit is used to:
  - 1)  Increase voltage gain
  - 2)  Improve stability and bandwidth
  - 3)  Reduce input impedance
  - 4)  Eliminate output voltage
- 13) What is the main purpose of a voltage-follower configuration?
  - 1)  To provide amplification

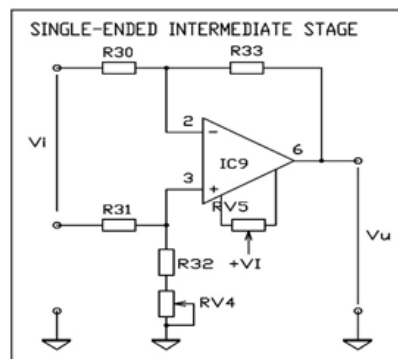




- 2)  To provide impedance matching
- 3)  To invert the input signal
- 4)  To introduce phase shift
- 14) Input offset voltage in a practical op-amp is:
- 1)  The voltage required to bring output to zero
- 2)  The voltage gain of the amplifier
- 3)  The supply voltage
- 4)  The frequency response
- 15) Which type of amplifier configuration provides the highest input impedance?
- 1)  Inverting amplifier
- 2)  Noninverting amplifier
- 3)  Voltage-follower
- 4)  Summing amplifier
- 16) Hysteresis in a comparator circuit helps to:
- 1)  Increase gain
- 2)  Convert signals to DC
- 3)  Reduce noise effects
- 4)  Limit output voltage
- 17) The -3 dB point in a low-pass filter is known as the:
- 1)  Gain margin
- 2)  Slew rate
- 3)  CMRR
- 4)  Cutoff frequency
- 18) The quality factor (Q) of a band-pass filter determines:
- 1)  The gain of the amplifier
- 2)  The impedance of the circuit
- 3)  The output voltage
- 4)  The width of the passband
- 19) The damping factor in filter design affects:
- 1)  The response characteristic of the filter
- 2)  The input voltage
- 3)  The power supply
- 4)  The resistor values
- 20) The function of an ECG acquisition system is to:
- 1)  Directly store heart signals
- 2)  Amplify heart signals and remove noise
- 3)  Convert signals to digital form
- 4)  Increase heart rate
- 21) A cardiographic amplifier uses which circuit before amplifying the signal?
- 1)  Optical coupler
- 2)  Transformer
- 3)  Protection circuit
- 4)  Voltage regulator
- 22) The electrode false contact detection circuit is based on:
- 1)  Optical coupling
- 2)  A passive capacitor
- 3)  A stable multivibrator
- 4)  A signal rectifier
- 23) The main function of the lead-fail detection circuit is to:



- 1) - Measure the frequency of the ECG signal
  - 2)  Detect false contact of electrodes
  - 3) - Adjust the amplifier gain
  - 4) - Reduce voltage spikes
- 24) Baseline restoration in an ECG amplifier is used to:
- 1) - Reduce the common-mode signal
  - 2) - Amplify the output voltage
  - 3) - Convert AC to DC
  - 4)  Reset the waveform after saturation
- 25) What does a differentiator circuit do?
- 1) - Integrates an input signal
  - 2)  Determines the rate of change of the input signal
  - 3) - Acts as a high-pass filter
  - 4) - Converts digital signals to analog
- 26) What is the quality factor (Q) of a band-pass filter?
- 1) - The frequency response of a low-pass filter
  - 2) - The total gain of the amplifier
  - 3) - The rate at which the filter attenuates signals
  - 4)  The ratio of the center frequency to the bandwidth
- 27) What determines the damping factor of a filter?
- 1) - The power supply voltage
  - 2)  The resistor and capacitor values in the circuit
  - 3) - The input impedance
  - 4) - The load resistance
- 28) The function of driven right leg circuit is to:
- 1)  Reducing common mode interference
  - 2) - Reducing the dc offset voltage
  - 3) - Ensure isolation of a patient from leakage current
  - 4) - Increase the amplification of body signal
- 29) A chopper stabilized amplifier is an electronic circuit that employs a modulation technique to:
- 1) - Compensate dc offset and low-frequency noise in op amps.
  - 2) - Compensate dc offset and high-frequency noise in op amps.
  - 3) - Eliminate dc offset and high-frequency noise in op amps.
  - 4)  Eliminate dc offset and low-frequency noise in op amps.
- 30) **From the following circuit, the variable resistor RV4 is used for:**



- 1)  Prevent the noise
- 2) - Adjustment Offset null



- 3) - Prevent saturation and adjust amplification
- 4) - Grounded resistor to providing the discharge of the Op-Amp IC9