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| --- | --- |
| 1. | A Schmitt trigger is |
| |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | a comparator with only one trigger point. | | [**B.**](javascript:%20void%200;) | a comparator with hysteresis. | | [**C.**](javascript:%20void%200;) | a comparator with three trigger points. | | [**D.**](javascript:%20void%200;) | none of the above. |   **Answer:** Option **B** |

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| 2. | Refer to the given figure. This circuit is known as   https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq13_1015_1b.jpeg |
| |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | a noninverting amplifier. | | [**B.**](javascript:%20void%200;) | a differentiator. | | [**C.**](javascript:%20void%200;) | an integrator. | | [**D.**](javascript:%20void%200;) | a summing amplifier. |   **Answer:** Option **C** |

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| 3. | The output of a Schmitt trigger is a |
| |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | pulse waveform. | | [**B.**](javascript:%20void%200;) | sawtooth waveform. | | [**C.**](javascript:%20void%200;) | sinusoidal waveform. | | [**D.**](javascript:%20void%200;) | triangle waveform. |   **Answer:** Option **A** |

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| 4. | Refer to the given figure. This circuit is known as   https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq13_1015_1a.jpeg |
| |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | a noninverting amplifier. | | [**B.**](javascript:%20void%200;) | a differentiator. | | [**C.**](javascript:%20void%200;) | an integrator. | | [**D.**](javascript:%20void%200;) | a summing amplifier. |   **Answer:** Option **B** |

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| 5. | Refer to the given figure. A square-wave input is applied to this amplifier. The output voltage is most likely to be   https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq13_1015_1b.jpeg |
| |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | a square wave. | | [**B.**](javascript:%20void%200;) | a triangle wave. | | [**C.**](javascript:%20void%200;) | a sine wave. | | [**D.**](javascript:%20void%200;) | no output. |   **Answer:** Option **B** |

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| 6. | Refer to the given figure. What is the output voltage?   https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq13_1008_1b.jpg<="" p="" style="margin: 0px; box-sizing: border-box; vertical-align: middle; border: 0px; outline: none;"> |
| |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | 2 V | | [**B.**](javascript:%20void%200;) | –2 V | | [**C.**](javascript:%20void%200;) | +Vsat | | [**D.**](javascript:%20void%200;) | –Vsat |   **Answer:** Option **D** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | 7. | If an op-amp comparator has a gain of 100,000, an input difference of 0.2 mV above reference, and a supply of https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/plusminus.gif12 V, the output will be | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | 20 V. | | [**B.**](javascript:%20void%200;) | 12 V. | | [**C.**](javascript:%20void%200;) | 10 V. | | [**D.**](javascript:%20void%200;) | 15 V. |   **Answer:** Option **B** |  |  |  | | --- | --- | | 8. | A comparator with a Schmitt trigger has | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | two trigger levels. | | [**B.**](javascript:%20void%200;) | a fast response. | | [**C.**](javascript:%20void%200;) | a slow response. | | [**D.**](javascript:%20void%200;) | one trigger level. |   **Answer:** Option **A** |  |  |  | | --- | --- | | 9. | Refer to the given figure. Determine the upper trigger point.   https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq13_1013_1a.jpeg | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | V(out)max | | [**B.**](javascript:%20void%200;) | –V(out)max | | [**C.**](javascript:%20void%200;) | –1.41 V | | [**D.**](javascript:%20void%200;) | +1.41 V | |   Upper trigger point(UTP)=R2Vmax/R1+R2 = (10e3)/(68e3+10e3) = +1.41v Where "e" stands for an exponent.   |  |  | | --- | --- | | 10. | In a(n) \_\_\_\_\_\_\_\_, when the input voltage exceeds a specified reference voltage, the output changes state. | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | integrator | | [**B.**](javascript:%20void%200;) | differentiator | | [**C.**](javascript:%20void%200;) | summing amplifier | | [**D.**](javascript:%20void%200;) | comparator |   **Answer:** Option **D** | |
| |  |  | | --- | --- | | What circuit produces an output that approximates the area under the curve of an input function? | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | integrator | | [**B.**](javascript:%20void%200;) | differentiator | | [**C.**](javascript:%20void%200;) | summing amplifier | | [**D.**](javascript:%20void%200;) | comparator |   **Answer:** Option **A** | | |  | An op-amp has an open-loop gain of 90,000. Vsat = ±13 V. A differential voltage of 0.1 V p-p is applied between the inputs. What is the output voltage? | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | 13 V | | [**B.**](javascript:%20void%200;) | –13 V | | [**C.**](javascript:%20void%200;) | 13 Vp-p | | [**D.**](javascript:%20void%200;) | 26 Vp-p |   **Answer:** Option **D**  **Explanation:** | | Refer to the given figure. Determine the output voltage.   https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq13_1008_1a.jpg | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | 1 V | | [**B.**](javascript:%20void%200;) | –1 V | | [**C.**](javascript:%20void%200;) | +Vsat | | [**D.**](javascript:%20void%200;) | –Vsat |   **Answer:** Option **C** | | | A good example of hysteresis is a(n) | | | |  |  | | --- | --- | | **[A].** | AM radio. | | **[B].** | |  |  | | --- | --- | | thermostat. | @ | | | **[C].** | alarm clock. | | **[D].** | none of the above |   **Answer:** Option **B** | |   Hysteresis means the system output depends on present input as well as past output, so that it can protect the system from undesired input value.  Similarly thermostat is device used to maintain the temperature at specified level.   |  |  | | --- | --- | |  | To reduce the effects of noise resulting in erratic switching of output states of a comparator, you can use | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | the upper trigger point. | | [**B.**](javascript:%20void%200;) | the lower trigger point. | | [**C.**](javascript:%20void%200;) | nonzero-level detection. | | [**D.**](javascript:%20void%200;) | hysteresis. |   **Answer:** Option **D** | | Refer to the given figure. With the inputs shown, determine the output voltage.   https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq13_1008_1c.jpg<="" p="" style="margin: 0px; box-sizing: border-box; vertical-align: middle; border: 0px; outline: none;"> | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | 7 V | | [**B.**](javascript:%20void%200;) | –7 V | | [**C.**](javascript:%20void%200;) | +Vsat | | [**D.**](javascript:%20void%200;) | –Vsat |   **Answer:** Option **C** | |  |  | | --- | | Refer to the given figure. Determine the output voltage, VOUT.   https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq13_1011_1b.jpeg | | |  |  |  |  | | --- | --- | --- | --- | | **[A].** | |  |  | | --- | --- | | 1.05 V | @ | | | **[B].** | –0.35 V | | **[C].** | 0.35 V | | **[D].** | –1.05 V |   **Answer:** Option **A** |   V0= -Rf[V1/R1+V2/R2+V3/R3]   |  | | --- | | What is (are) the necessary component(s) for the design of a bounded comparator? | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | rectifier diodes | | [**B.**](javascript:%20void%200;) | zener diodes | | [**C.**](javascript:%20void%200;) | both of the above |   **Answer:** Option **B** | | Refer to the given figure. What is the output voltage?   https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq13_1011_1a.jpeg | | |  |  | | --- | --- | | **[A].** | 0.5 V | | **[B].** | |  |  | | --- | --- | | –0.5 V | @ | | | **[C].** | 2 V | | **[D].** | –2 V |   **Answer:** Option **B** |   Its a summing amplifier... formulae is vo=-rf/ri{v1+v2+v3}=-.5v   |  | | --- | | Refer to the given figure. Determine the lower trigger point.   https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq13_1013_1b.jpeg | | |  |  | | --- | --- | | **[A].** | +V(out)max | | **[B].** | –V(out)max | | **[C].** | |  |  | | --- | --- | | –2.47 V | @ | | | **[D].** | +2.47 V |   **Answer:** Option **C** |   Vout=-Vin(R2/R1+1) then, Vout=-2\*(47k/200k+1) =-2\*(1.235) =-2.47V   |  |  | | --- | --- | | A(n) \_\_\_\_\_\_\_\_ amplifier is a summing amplifier with a closed-loop gain equal to the reciprocal of the number of inputs. | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | averaging | | [**B.**](javascript:%20void%200;) | scaling | | [**C.**](javascript:%20void%200;) | none of the above |   **Answer:** Option **A** | | | An integrator circuit | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | uses a resistor in its feedback circuit. | | [**B.**](javascript:%20void%200;) | uses an inductor in its feedback circuit. | | [**C.**](javascript:%20void%200;) | uses a capacitor in its feedback circuit. | | [**D.**](javascript:%20void%200;) | uses a resistor in its feedback circuit or uses a capacitor in its feedback circuit |   **Answer:** Option **C** | | | In a comparator with output bounding, what type of diode is used in the feedback loop? | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | Schottky | | [**B.**](javascript:%20void%200;) | junction | | [**C.**](javascript:%20void%200;) | zener | | [**D.**](javascript:%20void%200;) | varactor |   **Answer:** Option **C** | | | A comparator with hysteresis is sometimes known as a(n) | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | integrator. | | [**B.**](javascript:%20void%200;) | differentiator. | | [**C.**](javascript:%20void%200;) | Schmitt trigger. | | [**D.**](javascript:%20void%200;) | none of the above |   **Answer:** Option **C** | | | In which of the following are operational amplifiers (op-amps) used? | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | Oscillators | | [**B.**](javascript:%20void%200;) | Filters | | [**C.**](javascript:%20void%200;) | Instrumentation circuits | | [**D.**](javascript:%20void%200;) | All of the above |   **Answer:** Option **D** | | | Refer to this figure. If the value of R1 decreases, the voltage gain will \_\_\_\_\_\_\_\_ and the input impedance will \_\_\_\_\_\_\_\_.  https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq12_1011_1.gif | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | increase, increase | | [**B.**](javascript:%20void%200;) | increase, decrease | | [**C.**](javascript:%20void%200;) | decrease, decrease | | [**D.**](javascript:%20void%200;) | decrease, increase |   **Answer:** Option **B** | | | Refer to this figure. The purpose of R3 is  https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq12_1011_1.gif | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | for bias current compensation. | | [**B.**](javascript:%20void%200;) | for input offset voltage compensation. | | [**C.**](javascript:%20void%200;) | to set input impedance. | | [**D.**](javascript:%20void%200;) | to set input impedance and voltage gain. |   **Answer:** Option **A** | | | What is the level of the voltage between the input terminals of an op-amp? | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | Virtually zero | | [**B.**](javascript:%20void%200;) | 5 V | | [**C.**](javascript:%20void%200;) | 18 V | | [**D.**](javascript:%20void%200;) | 22 V |   **Answer:** Option **A** | | |  | What is the difference output voltage of any signals applied to the input terminals? | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | The differential gain times the difference input voltage. | | [**B.**](javascript:%20void%200;) | The common-mode gain times the common input voltage. | | [**C.**](javascript:%20void%200;) | The sum of the differential gain times the difference input voltage and the common-mode gain times the common input voltage. | | [**D.**](javascript:%20void%200;) | The difference of the differential gain times the difference input voltage and the common-mode gain times the common input voltage. |   **Answer:** Option **C** | | A three-stage op-amp can have a maximum phase lag of \_\_\_\_\_\_\_\_°. | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | –180 | | [**B.**](javascript:%20void%200;) | –90 | | [**C.**](javascript:%20void%200;) | –270 | | [**D.**](javascript:%20void%200;) | none of the above |   **Answer:** Option **C** | |  |  |  | | --- | --- | | Calculate the overall voltage gain of the circuit if R1 = 100 https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/omega.gif and Rf = 1 khttps://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/omega.gif.  https://www.indiabix.com/_files/images/electronic-devices-and-circuit-theory/mcq10_01400.gif | | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | –1 | | [**B.**](javascript:%20void%200;) | –10 | | [**C.**](javascript:%20void%200;) | 11 | | [**D.**](javascript:%20void%200;) | 9 |   **Answer:** Option **C** | | | . | The \_\_\_\_\_\_\_\_ amplifier configuration has the highest input impedance and the lowest output impedance of the three basic op-amp configurations. | | |  |  | | --- | --- | | [**A.**](javascript:%20void%200;) | non-inverting | | [**B.**](javascript:%20void%200;) | inverting | | [**C.**](javascript:%20void%200;) | voltage-follower |   **Answer:** Option **C** |   Gain = (Rf+R1)/R1 |