

8. Two resistors are connected in series across a 300-volt power supply. The voltage across one of them is measured at 120-volts. The voltage across the other must be:
- a. 12 volts. d. 180 volts.
 b. 50 volts. e. 420 volts.
 c. 75 volts.
9. A sine wave whose frequency is 80 kilocycles is to be viewed on an oscilloscope. If it is desired to view five cycles of this wave across the graticule, the time duration of the horizontal sweep trace should be about:
- a. 6.25 microseconds. d. 720 microseconds.
 b. 62.5 microseconds. e. 16 milliseconds.
 c. 165 microseconds.
10. In general, a pentode would be chosen instead of a triode to have a small:
- a. grid-plate amplification factor. d. number of socket connections.
 b. grid-plate capacitance. e. none of the above.
 c. plate resistance.
11. The "+GATE" is:
- a. a waveform obtained from the calibrator circuit.
 b. a waveform lasting for the time duration of the sweep sawtooth.
 c. derived from the vertical signal through a + amplifier.
 d. none of the above.
12. A conventional RC-coupled amplifier stage uses a pentode tube known to have a very large plate resistance. If the load resistance in the plate is 4,000 ohms, and if the voltage gain of the stage is 16, then the grid-plate transconductance of the pentode, expressed in micromhos, is about:
- a. 300. d. 8,500.
 b. 4,000. e. 11,600.
 c. 5,000.
13. If a signal is passed through two identical stages of amplification, each having a rise-time of 0.01 microseconds, what is the overall rise-time of the system?
- a. 0.02 μ sec. d. 0.014 μ sec.
 b. 0.01 μ sec. e. 0.025 μ sec.
 c. 0.005 μ sec.

14. An accurate source of _____ is required when checking sweep calibration of an oscilloscope.
- | | |
|---------------------------------------|--|
| <input type="checkbox"/> a. bandwidth | <input type="checkbox"/> f. drag |
| <input type="checkbox"/> b. voltage | <input type="checkbox"/> g. prop-wash |
| <input type="checkbox"/> c. current | <input type="checkbox"/> h. afterburner pressure |
| <input type="checkbox"/> d. power | <input type="checkbox"/> i. Mach numbers |
| <input type="checkbox"/> e. time | |
15. A total current of 195 milliamperes is sent through a parallel combination of two resistors. If the current in one of the resistors is 120 milliamperes, the current in the other resistor is:
- | | |
|--|---|
| <input type="checkbox"/> a. 1.5 milliamperes. | <input type="checkbox"/> d. 75 milliamperes. |
| <input type="checkbox"/> b. 17.5 milliamperes. | <input type="checkbox"/> e. 120 milliamperes. |
| <input type="checkbox"/> c. 24 milliamperes. | |
16. The input wave to be examined on a cathode-ray tube is most often applied to:
- a. the vertical deflecting plate
 - b. the horizontal deflecting plates
 - c. the control grid
 - d. the accelerating grid
 - e. the internal dag coating
17. A single-stage resistance-coupled audio amplifier with a load resistor of 2000 ohms, a plate resistance of 11,000 ohms and an amplification factor of 26 has a voltage gain of:
- | | |
|--------------------------------|----------------------------------|
| <input type="checkbox"/> a. 26 | <input type="checkbox"/> d. 2.36 |
| <input type="checkbox"/> b. 13 | <input type="checkbox"/> e. 2 |
| <input type="checkbox"/> c. 4 | |
18. To increase the height of the wave seen on an oscilloscope, we might adjust:
- | | |
|--|--|
| <input type="checkbox"/> a. brightness | <input type="checkbox"/> d. volts/cm |
| <input type="checkbox"/> b. focus | <input type="checkbox"/> e. triggering level |
| <input type="checkbox"/> c. sweep rate | |
19. The power gain of an amplifier is 32 decibels. If an attenuator having a loss of 10 decibels is inserted in the circuit of the amplifier, the effective overall gain of the two devices becomes:
- | | |
|---|---|
| <input type="checkbox"/> a. 3.2 decibels. | <input type="checkbox"/> d. 80 decibels. |
| <input type="checkbox"/> b. 22 decibels. | <input type="checkbox"/> e. 320 decibels. |
| <input type="checkbox"/> c. 35 decibels. | |

20. If a 5-volt (peak-to-peak) ac calibrating voltage causes a deflection of 2 centimeters in the beam of an electrostatically-deflected cathode-ray tube, what is the peak-to-peak voltage of an input ac wave causing a deflection of 0.8 centimeter?

- a. 1 volt d. 2.1 volts
 b. 1.8 volts e. 2.7 volts
 c. 2 volts

21. A ~~76~~⁵⁶,000-ohm resistor and a 30,000-ohm resistor are connected in parallel. The voltage across the 56,000-ohm resistor is 106 volts. The voltage across the 30,000-ohm resistor is:

- a. 46 volts. d. 171 volts.
 b. 106 volts. e. 202 volts.
 c. 138 volts.

22. A certain relay requires a coil current of 20 milliamperes to operate. If the coil resistance is 600 ohms, select the power-supply voltage which we would most likely use with this relay.

- a. 6 volts. d. 300 volts.
 b. 12 volts. e. 110 volts.
 c. 24 volts.

23. A delay line in an oscilloscope would normally be used to:

- a. increase the duration of the horizontal sweep.
 b. provide a time lag between the horizontal sweep and the sweep return.
 c. increase the rise-time of the vertical deflection system.
 d. permit the leading edge of the wave which triggers the sweep to be viewed.
 e. none of the above.

24. A triode whose amplification factor is 20 is usually classified as:

- a. Low G_m . d. Medium μ .
 b. High μ . e. Power amplifier.
 c. Voltage amplifier.

25. A 300-ohm resistor and a 900-ohm resistor are connected in parallel. The current in the 300-ohm resistor is 60 milliamperes. The current in the ~~600~~⁹⁰⁰-ohm resistor is:

- a. 8 milliamperes. d. 100 milliamperes.
 b. 20 milliamperes. e. 270 milliamperes.
 c. 35 milliamperes.

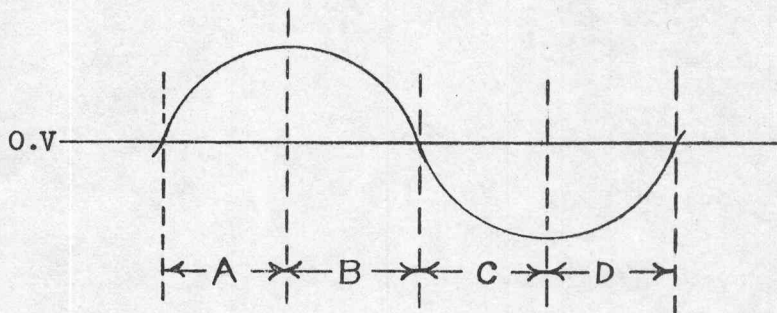
26. Waveshapes are drawn on a cathode-ray tube by electrically plotting
 _____ against _____.

- | | |
|------------|------------------|
| bandwidth | rise-time |
| resistance | time |
| current | reactance |
| amplitude | transconductance |

27. A tube having four elements is called:

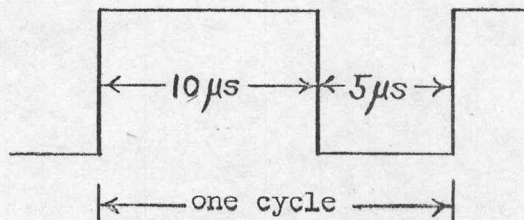
- | | |
|--|--|
| <input type="checkbox"/> a. a diode. | <input type="checkbox"/> d. a pentode. |
| <input type="checkbox"/> b. a triode. | <input type="checkbox"/> e. a hexode. |
| <input type="checkbox"/> c. a tetrode. | |

28. In order to trigger a scope on the negative slope of the waveform shown, which portion or portions could you derive the trigger from: _____.



29. Given the signal shown at the lower right, what sweep range setting would you use to observe a maximum of 3 complete cycles on the face of a CRT which has 10 cm of vertical deflection and 10 cm of horizontal deflection:

- a. 2 v/cm
- b. 1 v/cm
- c. 10 $\mu\text{sec}/\text{cm}$
- d. 5 $\mu\text{sec}/\text{cm}$
- e. 30 μsec

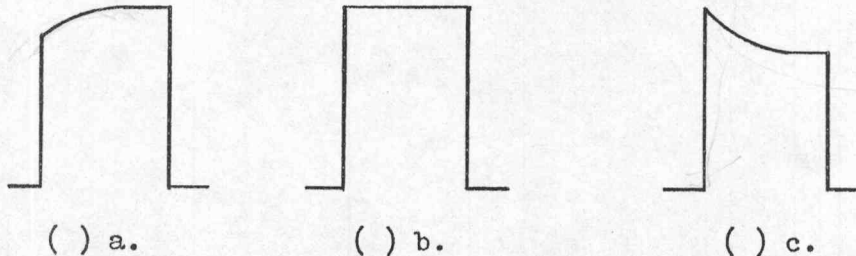


30. The dc voltage applied to a 20-ohm resistor is 200 volts. The power dissipated in the resistor is:
- a. 0.2 watt. d. 200 watts.
 b. 2 watt. e. 2000 watts.
 c. 20 watts.
31. The input voltage to a certain amplifier is 0.03 volt. Its output voltage is 60 volts. Its voltage gain is:
- a. 20 decibels. d. 66 decibels.
 b. 40 decibels. e. 81 decibels.
 c. 50 decibels.
32. In designing an input probe for an oscilloscope, the following quantity generally has to be made very large:
- a. power dissipation rating d. inductance
 b. resistance e. rise time
 c. Shunt capacitance
33. A device which is widely used for recovering a signal which was used to modulate a carrier wave is:
- a. a modulator. d. an amplifier.
 b. a detector. e. a phase inverter.
 c. an oscillator.
34. An amplifier tube in which plate current flows during the entire signal cycle is said to be operating as an amplifier of what class?
- a. Class A. d. Class AB₂.
 b. Class B. e. none of the above.
 c. Class C.
35. An electrical switch is known to be making intermittent contact in an aircraft wiring circuit carrying several amperes. Several scopes are available from the stockroom. These scopes have vertical amplifier bandwidths as shown below.
- Which one of the scopes listed would you choose to display most accurately the amplitude of the voltage developed across the switch contacts?
- a. Bandwidth of 5-mc; d. Bandwidth of 100-kc;
 b. Bandwidth of 30-mc; e. Bandwidth of 15-mc.
 c. Bandwidth of 1000 cps;

36. The purpose of the suppressor grid of a pentode is:

- a. To reduce secondary emission.
- b. To increase the amplification factor.
- c. Reduce plate resistance.
- d. Increase plate resistance.
- e. None of these.

37. Which of the three waveshapes shown below should you obtain when adjusting an RC oscilloscope probe containing a 10:1 resistance-capacitance divider?



38. The plate of a triode is supplied with current through a 20,000-ohm resistor. If the power-supply voltage is 200 volts, and if the voltage at the plate of the tube is 100 volts, what must be the plate current of the tube?

- a. 12 milliamperes.
- b. 9 milliamperes.
- c. 5 milliamperes.
- d. 2 milliamperes.
- e. 1 milliampere.

39. At a certain frequency, a coil has an inductive reactance of 4 ohms and a resistance of 3 ohms. When an effective voltage of 10 volts is placed across the coil, the effective current which results is:

- a. 3.33 amperes.
- b. 2.5 amperes.
- c. 2 amperes.
- d. 1.4 amperes.
- e. 0.7 amperes.

40. It is desired to produce horizontal linear deflection in an electrostatically-deflected cathode-ray tube. To accomplish this, we would likely apply to the deflecting plates a voltage wave having the following form:

- a. sawtooth
- b. square
- c. parabolic
- d. exponential
- e. sine

41. A device which is used for removing amplitude variations from a frequency-modulated signal, prior to detection, is:
- a. a voltage divider. d. an oscillator.
 b. an attenuator. e. a limiter.
 c. a frequency multiplier.
42. When the current through the following device is changed, a resulting voltage appears across its terminals which is proportional to the rate of change of current:
- a. an inductance coil. d. a voltage divider.
 b. a resistor. e. an attenuator.
 c. a capacitor.
43. The reactance of a 7-henry coil at 70 cycles is about:
- a. 10 ohms. d. 2,100 ohms.
 b. 56 ohms. e. 3,080 ohms.
 c. 61 ohms.
44. The voltage across the following device is proportional to the product of the current supplied to it, multiplied by the length of time during which the current flows:
- a. an inductance coil. d. a transformer.
 b. a capacitor. e. an attenuator.
 c. a resistor.