

Systems View of Electronics

1. Most technicians today will often test and replace
 - a. Capacitors
 - b. Integrated circuits
 - c. Resistors
 - d. Transistors

2. The focus of most technicians is to follow a signal through a system rather than troubleshoot at the component level
 - a. True
 - b. False

3. What is considered as the heart of all electronic systems?
 - a. Electronic components
 - b. Equipment
 - c. Printed circuit boards
 - d. Solder

4. Another name for a printed circuit board is a
 - a. Component
 - b. Green card
 - c. Module
 - d. System

5. What is a system?
 - a. A module run by software
 - b. A single mechanical component
 - c. Multiple electronic components on a printed circuit board
 - d. Two or more pieces of electronic equipment performing a function

6. Electronic systems come in only one shape and size.
 - a. True
 - b. False

7. Block diagrams are used to show
 - a. The flow of a signal between the different blocks
 - b. The interconnection of every discrete component
 - c. The PCB layout of every integrated circuit
 - d. All of the above can be true.



8. The output signal of an MP3 player is the
 - a. Battery supply
 - b. Headphone
 - c. Memory card
 - d. Music downloaded

9. Most electronic systems contain one or more _____ which monitor and control the signals.
 - a. Amplifiers
 - b. Embedded microcontrollers
 - c. Hard drives
 - d. Power supplies

10. Most systems are often made of a several smaller systems within it.
 - a. True
 - b. False

11. Which electronic process is the most common?
 - a. Amplification
 - b. Attenuation
 - c. Impedance matching
 - d. Modulation

12. A large signal amplifier will increase the _____ level of a signal.
 - a. Current
 - b. Impedance
 - c. Power
 - d. Voltage

13. Which process is the opposite of amplification?
 - a. Attenuation
 - b. Compression
 - c. Filtering
 - d. Phase shifting

14. What type of filter block diagram has a line through the top and bottom sine wave?
 - a. Band pass
 - b. High pass
 - c. Low pass
 - d. Notch

15. Modulation is a process used in every _____ application.
 - a. Computer
 - b. Hardware
 - c. Power
 - d. Wireless



16. Demodulation is the process of
- Converting a lower frequency signal to a higher frequency signal
 - Making a signal compatible with a transmission signal
 - Modifying a high frequency signal with a low frequency signal
 - Recovering the original signal from a transmitted signal
17. Another name for frequency translation is
- Amplifying
 - Comparing
 - Mixing
 - Summing
18. The decision-making process is usually a/an
- Analog process
 - Digital process
 - Either an analog or digital process
 - Real time process
19. AND, OR, and XOR are examples of _____ circuits.
- Analog
 - Logic
 - Modulation
 - Reference
20. The process of converting AC into pulsating DC is called
- Compression
 - Frequency translation
 - Inversion
 - Rectification
21. The ALU of a computer is where most _____ are performed.
- Amplification processes
 - Arithmetic operations
 - Compression processes
 - Phase shifting operations
22. What benefit does compression provide to analog signals?
- It creates a signal source
 - It makes the embedded controller faster
 - It reduces the noise
 - It reduces the number of bits needed



23. Sensors and transducers generates a source signal in response to
- A clock signal
 - An AC input signal
 - An adjustable frequency synthesizer
 - Changes in a physical characteristic
24. Which type of signal generator is used in digital circuits?
- Clock generator
 - Frequency synthesizer
 - Transducer
 - Voltage controlled oscillator
25. When very large or very small signals are encountered, the gains are expressed in
- Decibels
 - Ohms
 - Volts
 - Watts
26. If circuits are cascaded and their gains given in dB's, then the total gain is
- Equal to the highest individual gain
 - The difference between the individual gains
 - The product of the individual gains
 - The sum of the individual gains
27. What is the power gain in dB for an amplifier with a gain of 2.5?
- 2.5 dB
 - 3.98 dB
 - 7.96 dB
 - 9.16 dB
28. An amplifier has a gain of 5 dB. What will the output power be if the input power is 25 mW?
- 25.1 mW
 - 44.4 mW
 - 79 mW
 - 101 mW
29. Attenuation in dB is expressed with a
- Negative value
 - Positive value larger than 5
 - Squared value
 - Very large value



30. When passing a voltage signal from one circuit to another, the input impedance should be
 - a. As high as possible
 - b. As low as possible
 - c. At least half the output impedance
 - d. Equal to the output impedance

31. The voltage divider effect will cause the overall gain of cascaded circuits to
 - a. Decrease
 - b. Double
 - c. Increase
 - d. Stay the same

32. When maximum power transfer is needed, the input impedance must be _____ the load impedance
 - a. Equal to
 - b. Higher than
 - c. Lower than
 - d. Twice as big as

33. The frequency response of a circuit is the
 - a. Center frequency of the circuit
 - b. Frequency at which the circuit starts to respond
 - c. Frequency range over which the circuit will operate
 - d. Highest frequency the circuit will respond to

34. If the upper cutoff frequency of a circuit is 100 kHz and the lower cutoff frequency is 5 kHz, what is the bandwidth?
 - a. 95 kHz
 - b. 100 kHz
 - c. 105 kHz
 - d. 500 kHz

35. Low power consumption is critical in portable devices because it will
 - a. Keep the device operating properly
 - b. Keep the signal free from noise
 - c. Keep the signal regulated
 - d. Reduce the time between battery charges

36. In an AC operated supply, a _____ are used to convert AC to DC.
 - a. Battery charger and filter
 - b. Inverter and filter
 - c. Rectifier and filter
 - d. Transformer and filter



37. For a UPS, the primary source of voltage is a
- AC power line
 - Battery
 - Crystal oscillator
 - Sine wave
38. A UPS is used to
- Convert DC to AC
 - Ensure continuous power to critical systems
 - Provide additional power during peak operation
 - Reduce power consumption in critical systems
39. Power management circuits are often used to
- Maintain a specific power setpoint
 - Provide power during power outages
 - Reduce overall power consumption
 - All of the above
40. Control systems monitor a variable and make adjustments in order to
- Increase the circuit gain
 - Maintain a predetermined condition
 - Reduce power consumption
 - Select a predetermined condition
41. The two main types of control systems are
- High/low loop
 - Input/output loop
 - Open/closed door
 - Open/closed loop
42. A/an _____ system is one in which feedback is used to maintain a desired output.
- Closed loop
 - High loop
 - Low loop
 - Open loop
43. An amplifier with automatic gain control is used to
- Maintain a fixed gain
 - Maintain a fixed input voltage
 - Maintain a fixed motor speed
 - Maintain a fixed output voltage



44. An error detector circuit will
- Amplify the feedback
 - Compare the feedback to a setpoint
 - Compare the input signal to a setpoint
 - Maintain the feedback loop
45. A feedback control system that is widely used is called a/an
- Error detector loop
 - Low pass filter
 - Phase-locked loop
 - Signal loop
46. In a phase-locked loop, the VCO output is fed back to a _____
- Filter detector
 - Liquid detector
 - Phase detector
 - Shift detector
47. A phase-locked loop is said to be “locked” when the
- Input signal is greater
 - Output signal is greater
 - Two signals are 45 degrees out of phase
 - Two signals are equal
48. An interface is the connection between
- Two circuits
 - Two pieces of equipment
 - Two systems
 - All of the above
49. The _____ interfaces are either parallel or serial buses.
- Analog
 - Digital
 - Power
 - Voltage
50. Which type of interface will you find at a microphone?
- Analog
 - Digital
 - Power
 - Voltage



51. The type of interface and cable used for analog signals is determined by the _____ of the signal.
- Amplitude
 - Duration
 - Frequency
 - Phase shift
52. If a video signal has a wavelength of 312 feet, what is the maximum length the interface can be before it acts as a transmission line?
- 15.6 feet
 - 31.2 feet
 - 62.4 feet
 - 93.6 feet
53. At high frequencies, conductors that carry analog signals will tend to act as a _____ filter.
- Band pass
 - High pass
 - Low pass
 - Notch
54. When an interface cables act as transmission lines, the signals
- Are amplified
 - Are negatively affected
 - Are not affected
 - Move faster
55. Signal reflection can lead to
- Attenuation
 - Phase shifts
 - Signal distortion
 - All of the above
56. To eliminate signal reflection, the transmission line impedance must be
- Greater than the generator output impedance
 - Greater than the load impedance
 - Less than the generator output impedance and load impedance
 - Matched to a generator output impedance and load impedance
57. The most common type of transmission line is the
- Coax cable
 - Fiber optic cable
 - Shielded cable
 - Twisted pair



58. The characteristic impedance of a twisted pair cable is approximately
- 25 to 50 ohms
 - 50 to 75 ohms
 - 75 to 100 ohms
 - 100 to 150 ohms
59. In a parallel bus digital interface, the bits of a binary word are transmitted
- All at the same time
 - Eight bits at a time
 - One after another
 - Two bits at a time
60. The limitation of a parallel bus is the
- Availability
 - Distance over which signals can be carried
 - Physical size of a parallel bus
 - Speed of the data transfer
61. Another name for the small computer system interface (SCSI) is
- Common bus
 - Fuzzy bus
 - Scuzzy bus
 - Serial bus
62. In a serial interface, which bit/bits are transmitted first?
- Center bit
 - First 8 bits
 - Least significant bit
 - Most significant bit
63. What is the advantage of a serial bus?
- It can transmit over greater distances
 - It is a less expensive bus
 - It is a simpler bus
 - All of the above
64. If the bit time is 50 nanoseconds, what is the data rate of the serial bus?
- 20 Mbps
 - 40 Mbps
 - 50 Mbps
 - 100 Mbps



65. The most widely used interface for computer peripherals is the
- a. ATA bus
 - b. RS-232
 - c. RS-485
 - d. USB
66. Most local area networks use the _____ serial bus
- a. Ethernet
 - b. I²C
 - c. RS-485
 - d. SCSI