

## Chapter 4.5 – Quiz 1 – Active Components

G6A03 - What is the approximate forward threshold voltage of a germanium diode?

- A. 0.1 volt
- B. 0.3 volts
- C. 0.7 volts
- D. 1.0 volts

G6A05 - What is the approximate forward threshold voltage of a silicon junction diode?

- A. 0.1 volt
- B. 0.3 volts
- C. 0.7 volts
- D. 1.0 volts

G6A07 - What are the operating points for a bipolar transistor used as a switch?

- A. Saturation and cutoff
- B. The active region (between cutoff and saturation)
- C. Peak and valley current points
- D. Enhancement and depletion modes

G6A09 - Which of the following describes MOSFET construction?

- A. The gate is formed by a back-biased junction
- B. The gate is separated from the channel by a thin insulating layer
- C. The source is separated from the drain by a thin insulating layer
- D. The source is formed by depositing metal on silicon

G6A10 - Which element of a vacuum tube regulates the flow of electrons between cathode and plate?

- A. Control grid
- B. Suppressor grid
- C. Screen grid
- D. Trigger electrode

G6A12 - What is the primary purpose of a screen grid in a vacuum tube?

- A. To reduce grid-to-plate capacitance
- B. To increase efficiency
- C. To increase the control grid resistance
- D. To decrease plate resistance

G6B02 - What is meant by the term MMIC?

- A. Multi-Mode Integrated Circuit
- B. Monolithic Microwave Integrated Circuit
- C. Metal Monolayer Integrated Circuit
- D. Mode Modulated Integrated Circuit

G6B03 - Which of the following is an advantage of CMOS integrated circuits compared to TTL integrated circuits?

- A. Low power consumption
- B. High power handling capability
- C. Better suited for RF amplification
- D. Better suited for power supply regulation

G6B06 - What kind of device is an integrated circuit operational amplifier?

- A. Digital
- B. MMIC
- C. Programmable Logic
- D. Analog

G7B03 - Which of the following describes the function of a two-input AND gate?

- A. Output is high when either or both inputs are low
- B. Output is high only when both inputs are high
- C. Output is low when either or both inputs are high
- D. Output is low only when both inputs are high

G7B05 - How many states does a 3-bit binary counter have?

- A. 3
- B. 6
- C. 8
- D. 16

G7B06 - What is a shift register?

- A. A clocked array of circuits that passes data in steps along the array
- B. An array of operational amplifiers used for tri-state arithmetic operations
- C. A digital mixer
- D. An analog mixer

G6B08 - How is an LED biased when emitting light?

- A. In the tunnel-effect region
- B. At the Zener voltage
- C. Reverse biased
- D. Forward biased

G6B09 (A)

How does a liquid crystal display compare to an LED display?

- A. Higher contrast in high ambient lighting
- B. Wider dynamic range
- C. Higher Power consumption
- D. Shorter lifetime

End of Quiz 1

## Chapter 4.6 – Quiz 2 – Practical Circuits

G7A01 - What is the function of a power supply bleeder resistor?

- A. It acts as a fuse for excess voltage
- B. It discharges the filter capacitors when power is removed
- C. It removes shock hazards from the induction coils
- D. It eliminates ground loop current

G7A02 - Which of the following components are used in a power supply filter network?

- A. Diodes
- B. Transformers and transducers
- C. Capacitors and inductors
- D. All these choices are correct

G7A03 - Which type of rectifier circuit uses two diodes and a center-tapped transformer?

- A. Full-wave
- B. Full-wave bridge
- C. Half-wave
- D. Synchronous

G7A04 - What is characteristic of a half-wave rectifier in a power supply?

- A. Only one diode is required
- B. The ripple frequency is twice that of a full-wave rectifier
- C. More current can be drawn from the half-wave rectifier
- D. The output voltage is two times the peak input voltage

G7A05 - What portion of the AC cycle is converted to DC by a half-wave rectifier?

- A. 90 degrees
- B. 180 degrees
- C. 270 degrees
- D. 360 degrees

G7A06 - What portion of the AC cycle is converted to DC by a full-wave rectifier?

- A. 90 degrees
- B. 180 degrees
- C. 270 degrees
- D. 360 degrees

G7A07 - What is the output waveform of an unfiltered full-wave rectifier connected to a resistive load?

- A. A series of DC pulses at twice the frequency of the AC input
- B. A series of DC pulses at the same frequency as the AC input
- C. A sine wave at half the frequency of the AC input
- D. A steady DC voltage

G7A08 - Which of the following is characteristic of a switchmode power supply as compared to a linear power supply?

- A. Faster switching time makes higher output voltage possible
- B. Fewer circuit components are required
- C. High-frequency operation allows the use of smaller components
- D. Inherently more stable

G4E08 - In what configuration are the individual cells in a solar panel connected together?

- A. Series-parallel
- B. Shunt
- C. Bypass
- D. Full-wave bridge

G4E09 - What is the approximate open-circuit voltage from a fully illuminated silicon photovoltaic cell?

- A. 0.02 VDC
- B. 0.5 VDC
- C. 0.2 VDC
- D. 1.38 VDC

G4E10 - Why should a series diode be connected between a solar panel and a storage battery that is being charged by the panel?

- A. To prevent overload by regulating the charging voltage
- B. To prevent discharge of the battery through the panel during times of low or no illumination
- C. To limit the current flowing from the panel to a safe value
- D. To prevent damage to the battery due to excessive voltage at high illumination levels

G4E11 - What precaution should be taken when connecting a solar panel to a lithium iron phosphate battery?

- A. Ground the solar panel outer metal framework
- B. Ensure the battery is placed terminals-up
- C. A series resistor must be in place
- D. The solar panel must have a charge controller

G6A01 - What is the minimum allowable discharge voltage for maximum life of a standard 12-volt lead-acid battery?

- A. 6 volts
- B. 8.5 volts
- C. 10.5 volts
- D. 12 volts

G6A02 - What is an advantage of batteries with low internal resistance?

- A. Long life
- B. High discharge current
- C. High voltage
- D. Rapid recharge

G6B04 - What is a typical upper frequency limit for low SWR operation of 50-ohm BNC connectors?

- A. 50 MHz
- B. 500 MHz
- C. 4 GHz
- D. 40 GHz

G6B07 - Which of the following describes a type N connector?

- A. A moisture-resistant RF connector useful to 10 GHz
- B. A small bayonet connector used for data circuits
- C. A low noise figure VHF connector
- D. A nickel plated version of the PL-259

G6B11 - What is an SMA connector?

- A. A type-S to type-M adaptor
- B. A small threaded connector suitable for signals up to several GHz
- C. A connector designed for serial multiple access signals
- D. A type of push-on connector intended for high-voltage applications

G6B12 - Which of these connector types is commonly used for low frequency or dc signal connections to a transceiver?

- A. PL-259
- B. BNC
- C. RCA Phono
- D. Type N

End of Quiz 2

G4B01 - What item of test equipment contains horizontal and vertical channel amplifiers?

- A. An ohmmeter
- B. A signal generator
- C. An ammeter
- D. An oscilloscope

G4B02 - Which of the following is an advantage of an oscilloscope versus a digital voltmeter?

- A. An oscilloscope uses less power
- B. Complex impedances can be easily measured
- C. Greater precision
- D. Complex waveforms can be measured

G4B03 - Which of the following is the best instrument to use for checking the keying waveform of a CW transmitter?

- A. An oscilloscope
- B. A field strength meter
- C. A sidetone monitor
- D. A wavemeter

G4B04 - What signal source is connected to the vertical input of an oscilloscope when checking the RF envelope pattern of a transmitted signal?

- A. The local oscillator of the transmitter
- B. An external RF oscillator
- C. The transmitter balanced mixer output
- D. The attenuated RF output of the transmitter

G4B05 - Why do voltmeters have high input impedance?

- A. It improves the frequency response
- B. It allows for higher voltages to be safely measured
- C. It improves the resolution of the readings
- D. It decreases the loading on circuits being measured

G4B06 - What is an advantage of a digital multimeter as compared to an analog multimeter?

- A. Better for measuring computer circuits
- B. Less prone to overload
- C. Higher precision
- D. Faster response

G4B09 - When is an analog multimeter preferred to a digital multimeter?

- A. When testing logic circuits
- B. When high precision is desired
- C. When measuring the frequency of an oscillator
- D. When adjusting circuits for maximum or minimum values

G4B10 - Which of the following can be determined with a directional wattmeter?

- A. Standing wave ratio
- B. Antenna front-to-back ratio
- C. RF interference
- D. Radio wave propagation

G4B11 - Which of the following must be connected to an antenna analyzer when it is being used for SWR measurements?

- A. Receiver
- B. Transmitter
- C. Antenna and feed line
- D. All these choices are correct

G4B12 - What effect can strong signals from nearby transmitters have on an antenna analyzer?

- A. Desensitization which can cause intermodulation products which interfere with impedance readings
- B. Received power that interferes with SWR readings
- C. Generation of harmonics which interfere with frequency readings
- D. All these choices are correct

G4B13 - Which of the following can be measured with an antenna analyzer?

- A. Front-to-back ratio of an antenna
- B. Power output from a transmitter
- C. Impedance of coaxial cable
- D. Gain of a directional antenna

End of Quiz 3