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

Chapter 4.7 – Quiz 3 – Basic Test Equipment

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