General CBT Exam Review

Disadvantage of using consumer electronic equipment in a broadcast operation? Unbalanced audio connectors, poor RF shielding, ungrounded power cord, all of the above? All of the above.

Transformer primary has 100 turns and secondary has 1000 turns. Voltage across primary is 120V. Voltage across secondary is 1200 V.

Read/write memory chip is most likely to be: RAM, ROM, MPU, MUX. MUX is multiplexer, MPU is memory processing unit or microprocessor unit. ROM is read only memory. RAM is random access memory, which reads and writes.

In a purely capacitive circuit the: current leads the voltage by 90 degrees, voltage leads the current by 90 degrees, voltage and current are in phase, voltage and current are 180 degrees out of phase? Current leads the voltage by 90 degrees. ELI the ICE man. Voltage leads current in an inductive circuit, current leads voltage in a capacitive circuit.

The reactance of a capacitor: increases as frequency increases, decreases as frequency increases, is not affected by frequency? Decreases as frequency increases.

The vertical component of a vector is 3, and the horizontal component is 4. What is the length of the resultant? 7, 25, 5, or 1? 5. Pythagorean theorem.

In a simple series circuit, the source impedance is 600 ohms and the load impedance is also 600 ohms. Of total power in the circuit, how much is dissipated in the load? 100%, 50%, none, 10W? t0%. Source impedance could be the resistance of a battery, or it could be the impedance of a power supply. Model this by a circuit with a voltage source, a 600 ohm resistor modeling source resistance, a 600 ohm resistor modeling load resistance. If voltage source is 600 volts, current is 0.5A (1200 ohms total resistance in series). Power dropped across each is 300 volts (dissipating 150 watts each). Impedance match results in only 50% of the power transferred.

When referring to magnetomotive force, the saturation point is reached when: the coil of an electromagnet is carrying its maximum current, the iron core of an electromagnet starts to become warm from the heat of the current in the wire, the coils of wire in an electromagnet are placed as close together as possible and have a maximum current flowing, an increase in magnetomotive force fails to produce an increase in the number of lines of flux? Not first choice since reach saturation before coil hits its maximum current. Core will get warm from any level of current, so not second choice. Not maximum current flowing. Last one is the answer.

1 kHz is equivalent to 1000 Hz.

In descending order, the prefixes for powers of ten multipliers are: giga, mega, kilo, centi, milli, micro, nano, pico.

Definition of Power Factor is: true watts being drawn in an AC circuit, true amperage being drawn in an AC circuit, apparent wattage being drawn in a DC circuit, ratio of actual power expressed in watts to the apparent power being drawn expressed in volt-amperes in an AC circuit. It's the last one. What does power factor relate to? Powering a circuit that has a reactive load. Used for AC, like transmitters or motors.

When flashlight batteries are used in series, the voltage is increased. Using 1.5V batteries, how many

will be needed in series to deliver 6V? 4.

The number of kilometers per mile and meters per foot are: 1.609 and 0.3048.

In a simple circuit, 100 VDC is applied to a load which dissipates 100 watts. If the applied voltage is increased to 200V, how many watts must the load dissipate? 400 watts. Power goes up by the **square** of the voltage.

ST, SMA, and Biconic are common connectors used on: coax, 300 ohm balanced transmission line, fiber optics, RG-59? Fiber optics. ST is very specific to fiber optics. There is an SMA connector for coax too. No connectors for 300 ohm balanced except for a spade lug. RG-59 is a model number for coax.

Which of the following oscillators MUST use a crystal to control frequency? Armstrong, Hartley, Colpitts, Pierce? **Homework assignment for two weeks from Tuesday, for electronics class**. Look up all oscillators available. The more oscillators you give Steve with a description of how they work and their characteristics. Worth 50 points.

Safety

A ¼ watt film resistor with a 1% resistance tolerance must be soldered to a printed circuit board foil pattern. The desired size of soldering iron wattage is: 250 watts, 150 watts, 45 watts, 100 watts. 45 watts. Want to use a low wattage on a PC board foil pattern, which is just glued to the board. How are circuit boards are made? Copper cladding glued onto a substrate. Etch away with acid the copper we don't want. Heat quickly breaks down glue. I'd use a 25 watt tip, but Steve says they are talking about a plate-through, which requires more power.

When working on a transmitter that employs high voltage power supplies: always keep your left hand firmly on the chassis, bypass all interlocks to gain access into the cabinet, discharge the power supply capacitors only if you notice a plate voltage indication after the power is removed, work with another person whenever possible? What would be an interlock in this case for a transmitter? An example of an interlock is the one on microwave ovens that turns off the oven when you open the door. Who is the one person who can disable the interlock on the transmitter? Us. Don't bypass interlocks unless you really have to. Answer is work with another person.

If you have a traffic accident or receive a moving vehicle citation in a company vehicle: do not tell your supervisor, report the mishap to your supervisor, pay any fine yourself and keep quiet, act as if it were your personal vehicle involved, but do not report the accident to the company? Report mishap to supervisor.

When a worker comes into contact with a lethal electric source, what should the rescuer do first? Grab victim and pull them to safety, cover victim with a blanket, stop current flow without subjecting anyone other than the victim to the danger of shock, discharge the victim's body with a grounding stick? Stop current flow.

When using a multi-range meter to read an unknown current, start with: lowest range, highest range, middle range, the meter in the ohms mode? Highest range.

The purpose of the bleeder resistor in a transmitter is to : bleed excessive plate voltage to ground, to provide a common ground in the cathode-follower circuit, to prevent damage to capacitors by bleeding excess voltage to ground, to prevent danger to technicians by discharging capacitors when circuitry is

off? Prevent danger to technicians. We used a 1 megohm bleeder resistor on the second anode of the CRTs we used in lab to protect us, not the CRT.

Some TV receivers have a polarized plug on the AC cord. What safety hazard can be created by replacing this plug with a non-polarized plug? The chassis and possibly some exposed metal on the cabinet may become electrically hot to ground.

To avoid damage to technical equipment while putting out a fire, the fire should be put out with: flame resistant blanket, dry chemicals, water, carbon dioxide? Carbon dioxide.

What is the primary purpose of construction codes? Electrical interference elimination, maintenance of the beauty of the landscape, safety, A and B? This is for stuff like a transmitter site. Safety.

In any three wire grounded outlet, the neutral wire is: green, black, white, none of the above (only the box is grounded). White. Black is hot, green is safety ground.

Before using an AC powered drill: confirm that the bit is not oversized or too large, confirm that the chuck has been properly tightened, confirm that the grounding device is in proper working order, all of the above? All of the above.

It is necessary to probe inside a piece of equipment containing lethal voltages. The hand not being used to probe should be: firmly clutching the chassis, kept inside a pocket, grounded with a ground strap, all of the above? Kept inside a pocket. The resistor in a ground strap is 10 megohms, so this will protect you above your body's skin resistance.

What limits are set by NCRP/ANSI standards? Effective radiated power of a broadcast facility, human exposure to RF, construction materials used in broadcast towers, none of the above? Human exposure to RF. NCRP stands for National Council on Radiation Protection and Measurements. See http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet56/oet56e4.pdf

Break

Satellite and Microwave

What is the altitude of a satellite positioned in a geo-stationary orbit above the equator? 161, 22300, 238000, 93000000 miles? 22,300 miles.

The discriminator of a calibrated microwave receiver will read what voltage upon receiving the carrier it is tuned to: 0VDC, +1.732VDC, -1.732VDC, +1.414VDC? 0VDC. Discriminators are for FM. Similar to the phase locked loop. What kind of voltage did we have to have at the center of our ramp (equivalent to tuning to the carrier)? 0 volts.

In a microwave system, the signal is demodulated by the: mixer, discriminator, AGC circuit, last stage amplifier? Discriminator.

Which frequencies used by US domestic satellite transponders are more susceptible to attenuation from snow, rain, or fog between the earth and satellite? KU band.

In a Microwave Path Calculation study, the most important element that would affect the calculated Fade Margin would be: reduced transmitter power output, increased foliage growth near the transmitter or receiver, insufficient field allowance calculated into path, all of the above? All of the above.

In a typical receive only Earth Station, the signal to noise ratio may be improved by the following: increase the size of the antenna, reduce the LNA (low noise amplifier) noise temperature, reduce the length of the coaxial cable length from the LNA to the receiver, all of the above? All of the above.

If the desired geostationary satellite is located at a position of 80 degrees West Longitude, and the receive station is located at 80 degrees West Longitude and at 40 degrees North Latitude, the receive station will have a **true azimuth** of: 90 degrees, 180 degrees, 270 degrees, 360 degrees? 180 degrees.

Microwave frequencies are normally expressed in which of the following terms? Gigahertz.

Which satellite system uses the frequencies 3700 to 4200 MHz? KU, S, C, VHF? C.

TV RF

Analog to digital (A/D) conversion is characterized by: sampling the analog signal at regular intervals to create a digitized version, performing an inverse Fourier transform to create a digital signal, taking the reciprocal integral of the analog signal, always using a sample rate of less than the highest analog frequency? Sampling analog signal at regular intervals to create a digitized version.

The process of transforming a signal from the analog domain to the digital domain includes which of the following: analog words with discrete values of one or zero, digital words with discrete values of one or zero, digital words with at least 1.732 discrete values, digital words with discrete values of one or minus one? Digital words with discrete values of one or zero.

In digital television, the term SDI stands for: serial digital interface, strategic digital interface, status diit...

The unmodulated output of a TV transmitter is referred to as the : channel, discriminator, trapezoidal envelope, carrier? Carrier.

The overall data rate for the U.S. 8-VSB digital television system is: 1.44 Mb/sec, 9.3 Mb/sec, 19.4 Mb/sec, 44.0 Mb/sec? 19.4 Mb/sec (actually 19.39).

Regarding NTSC television transmitters, the term carrier means: the modulated output, the output frequency of the master oscillator, the output of the transmitter at 0% modulation, the crate in which the transmitter is transported? The output of the transmitter at 0% modulation.

RF signal coverage is determined by: radiated ERP, antenna HAAT, FCC F(50/50) Propagation Curves, all of the above? All of the above.

What NTSC television receiver control would change the hue of the displayed video? Contrast, color, sharpness, tint.

A low band NTSC television station shall operate at a power of: 25 dBk, 34 dBk, 20 dBk, 37 dBk? The meaning of dBk is decibels as compared to a reference power of one kilowatt. 20 dBk.

The NTSC transmission system uses both a Visual and Aural transmitter. The modulation methods used are: Visual is AM, Aural is FM.

The maximum aural carrier deviation for a NTSC TV transmitter during monaural modulation is: 150 kHz, 25 kHz, 75 kHz, 200 kHz? 4.5 MHz audio carrier within the channel. 25 kHz.

The purpose of the filament step-start system for NTSC TV transmitter power tubes is to: improve the

efficiency of the tube, reduce filament power draw from the power supply, prevent sudden start-up inrush current from damaging the tube filaments, prevent excessive plate current draw? Prevent sudden start-up inrush current from damaging the tube filaments.

What NTSC television receiver control is most likely to correct adjacent channel interference on the screen? Vertical hold, fine tuner, horizontal hold, hue control. Fine tuner.

The visual carrier of NTSC TV channel 13 is 211.25 MHz. What is the aural carrier frequency? 206.75, 210.00, 215.75, 214.83 MHz? 215.75 MHz. Visual carrier is 1.25 MHz above the base frequency of the channel, or 210 MHz. Aural carrier is 4.5 MHz above the visual carrier, so add 1.25 + 4.5 + 210 = 215.75 MHz.

The required NTSC television signal level over the principal community is: 3.58 mV, city grade, Grade A, Grade B? City grade.

The number of different codes available from an eight-bit number is also the number of quantizing intervals. The number is: 64, 256, 760, 1080? 256.

The most useful instrument for locating RF interference is the : interferometer, TV receiver, field meter, spectrum analyzer. Spectrum analyzer.

In a NTSC television broadcast system, amplitude modulation is used for what kind of signals? Audio, video, attenuated, none of the above? Video.

In a NTSC television broadcast system, frequency modulation is used for what kind of signals? Audio, video, attenuated, none of the above? Audio.

In the US, which of the following combinations of scanning rates for HDTV is permissible? 525P – 1050I, 60V – 15734H, 720P – 1080I, all of the above? 720P – 1080I.

If a transmitting tube has a negative bias of -1.5 volts and an AC signal with a peak to peak voltage of 2 volts is applied to the grid, what is the reference or zero signal level of the grid to cathode voltage? 0 volts, -1.5 volts, -3.5 volts, +1.5 volts? -1.5 volts.

For the ATSC 8-VSB system, the symbol rate is: 4.5 MHz, 5.082138 MHz, 10.76 MHz, 19.39 MHz. **10.76 MHz** (put this in your black books).

Why is it undesirable to replace a carbon resistor with a wirewound resistor in a RF circuit? A wirewound resistor can introduce excessive capacitance into the circuit, a wirewound resistor can introduce excessive inductance into the circuit, a wirewound resistor can be used provided its power rating and resistance are carefully matched with the original carbon resistor, a wirewound resistor can introduce excessive reactance into the circuit? Excessive inductance.

What frequencies are employed for television broadcasting on Channels 7-13? 470-806 MHz, 54-88 MHz, 174-216 MHz, 2-30 MHz? 174-216 MHz.

The name of the transmitting system used to transmit video, audio, and other signals from the studio location to the transmitter site is called: a TSL system, a STL system, an ICR system, an RPU system. A STL system.

Lunch