INDUSTRY CANADA
ADVANCED QUALIFICATION QUESTION BANK

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VIa) ANTENNAS

1001. An isotropic antenna is: (1) a half-wave reference dipole (2) an infinitely long piece of wire (3) a dummy load (4) a hypothetical point source

1002. What is the main reason why so many VHF base and mobile antennas in the Amateur service are 5/8 of a wavelength? (1) it's easy to match the antenna to the transmitter (2) it's a convenient length on VHF (3) the angle of radiation is high giving excellent local coverage (4) most of the energy is radiated at a low angle

1003. The "doublet antenna" is the most common in the amateur service. If you were to cut this antenna for 3,750 kHz, what would be its approximate length? (1) 32 metres (105 ft) (2) 38 metres (125 ft) (3) 45 metres (145 ft) (4) 75 metres (245 ft)

1004. The spacing between the elements on a 3-element Yagi antenna, representing the best overall choice, is _____ of a wavelength: (1) 0.15 (2) 0.2 (3) 0.5 (4) 0.75

1005. On VHF, UHF and above, polarization of the receiving antenna is very important in relation to the transmitting antenna, yet on HF it becomes relatively unimportant. Why is that so? (1) the ionosphere can change the polarization of the signal from moment to moment (2) the ground wave and the sky wave continually shift the polarization (3) anomalies in the earth magnetic field produce a profound effect on HF polarization, but not on VHF and above (4) greater selectivity is possible with HF receivers, making changes in polarization redundant

1006. If the centre impedance of a folded dipole is approximately 300 ohms and you are using RG8U (50 ohms) coaxial lines, what is the ratio required to have the line and the antenna matched? (1) 10:1 (2) 2:1 (3) 4:1 (4) 6:1

1007. Diagram 9 shows a means of matching the driven element of a beam antenna to coaxial cable. It is called a: (1) gamma match (2) lambda match (3) "T" match (4) zeta match

Diagram 9

1008. When using a SWR bridge in the antenna feedline, the most accurate indication of match between the feedline and the antenna is: (1) at the output of the transmitter (2) at the input to the antenna tuner (3) at exactly one-half wavelength from the antenna (4) as close as possible to the antenna terminals

1009. The reciprocal of the square root of the dielectric constant of the material used to separate the conductors in a transmission line gives the _____ of the line: (1) impedance (2) VSWR (3) velocity factor (4) hermetic losses

1010. A transmitter has an output of 100 watts. The cable and connectors have a composite loss of 3 dB and the antenna has a gain of 6 dB. What is the effective radiated power at the antenna? (1) 200 watts (2) 300 watts (3) 350 watts (4) 400 watts

1011. The most important consideration when deciding upon an antenna for contacting stations at great distances (DX) is: (1) sunspot activity (2) angle of radiation (3) impedance (4) bandwith

1012. Most simple horizontally polarized antennas do not exhibit any directivity unless they are: (1) an eighth of a wavelength above the ground (2) three-eighths of a wavelength above the ground (3) a quarter wavelength above the ground (4) a half wavelength or more above the ground

1013. In free space what is the radiation characteristic of a half-wave dipole? (1) omnidirectional (2) maximum radiation from the ends, minimum broadside (3) minimum radiation from the ends, maximum broadside (4) maximum radiation at 45 degrees to the plane of the antenna

1014. The plane from which ground reflections can be considered to take place, or the effective ground plane for an antenna is: (1) as much as a metre above ground (2) at ground level exactly (3) as much as 6 cm below ground depending upon soil conditions (4) several centimetres to as much as 2 metres below ground depending upon soil conditions

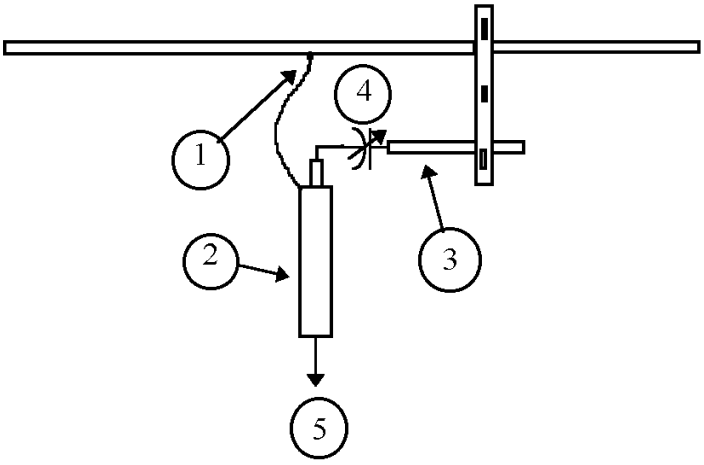
1015. What is the term used for an equivalent resistance which would dissipate the same amount of energy as that radiated from an antenna? (1) radiation resistance (2) “j” factor (3) antenna resistance (4) “K” factor

1016. The range of frequencies over which the antenna will perform well, i.e., with a relatively low SWR is called the _____ antenna: (1) gain (2) front-to-back ratio (3) radiation resistance (4) bandwidth

1017. If figure 10 represents a half-wave dipole, the dotted line would represent the _____ distribution: (1) current (2) voltage (3) inductance (4) capacitive

1018. If figure 10 represents a half-wave dipole, the solid curved line would represent the _____ distribution: (1) current (2) voltage (3) inductance (4) capacitive

Figure 10



1019. What is the name given to a parasitic beam antenna using two or more straight metal elements arranged physically parallel to each other? (1) cubical quad (2) delta loop (3) Yagi-Uda (4) collinear

1020. Which of the following are called “parasitic” element(s) when referring to a Yagi-Uda antenna? (1) the driven elements of array (2) the reflector element only (3) the director(s) (4) the director(s) and the reflector

1021. The bandwidth of a Yagi-Uda antenna can be increased by: (1) decreasing the spacing between elements (2) increasing the spacing between elements (3) tilting the beam in a vertical plane (4) placing a gamma match between the boom and the reflector

1022. You are required to assemble a ground plane quarter-wave vertical with a centre frequency of 21.250 MHz. The appropriate length of the radiating element would be: (1) 9 ft./2.74 metres (2) 11 ft./3.35 metres (3) 13 ft./3.96 metres (4) 15 ft./4.57 metres

1023. Why is a ground-mounted vertical quarter-wave antenna in reasonably open surroundings better for long distance contacts than a half-wave dipole at a quarter wavelength above ground? (1) it uses vertical polarization (2) the radiation resistance is lower (3) the radiation angle is lower (4) it has an omnidirectional characteristic

1024. A ground-mounted vertical antenna is sometimes called a: (1) Marconi (2) Hertz (3) Maxwell (4) Siemens

1025. The double Zepp antenna, the extended double Zepp antenna and the “Lazy H” antenna are:

(1) Marconi antennas (2) Yagi antennas (3) Collinear antennas (4) Cubical Quad antennas

1026. You wish to have a vertical antenna that propagates all of its energy as close to the horizon as possible without any high angle secondary lobes. Which of the following antennas would you choose? (1) quarter wavelength (2) five-eights wavelength (3) three-quarters wavelength (4) one wavelength

1027. One solution to multiband operation with a shortened radiator is the “trap dipole” or trap vertical. These “traps” are actually: (1) a coil and capacitor in parallel (2) hollow metal cans (3) large wire-wound resistors (4) coils wrapped around a ferrite rod

1028. A centre-fed half-wave dipole with the centre high and the ends drooping (inverted V or a drooping dipole) is to be constructed using the formula for a half-wave dipole. The end product is found to be resonant at _____ that was indicated by the formula: (1) double the frequency (2) a slightly higher frequency from that (3) a slightly lower frequency from that (4) half the frequency

1029. If the forward gain of a six-element Yagi is about 10 dB, what would the gain of two of these antennas be if they were “stacked”? (1) 7 dB (2) 10 dB (3) 13 dB (4) 16 dB

1030. Coaxial cable used by cable TV companies is quite often available at relatively cheap prices. This cable has an impedance of approximately 72 ohms. If your antenna and transmitter were both 50 ohms, what would you expect to see on an SWR bridge at the transmitter? (1) 1:1 (2) 1.5:1 (3) 2:1 (4) 3:1

1031. The gain of an antenna, especially on VHF and above, is quoted in dBi. The “i” in this expression stands for: (1) interpolated (2) ideal (3) ionosphere (4) isotropic

1032. Polarization change often takes place on radio waves that are propagated over long distances. Three of the following are causes of polarization change: (Choose the INCORRECT answer) (1) parabolic interaction (2) reflections (3) passage through magnetic fields (Faraday rotation) (4) refractions

1033. The Cubical Quad or “Quad” antenna consists of two or more square loops of wire. The driven element has an appropriate overall length of: (1) two wavelengths (2) one-half wavelength (3) three-quarters of a wavelength (4) one wavelength

1034. The Delta loop antenna consists of two or more triangular structures mounted on a boom. The overall length of the driven element is approximately: (1) one-quarter of a wavelength (2) one-half of a wavelength (3) one wavelength (4) two wavelengths

1035. The net result of power not being completely absorbed by the load at the end of a transmission line is a counter voltage being returned to the source. This is known as the: (1) back wave (2) inverse wave (3) dissimilar wave (4) reflected wave

1036. A transmission line differs from an ordinary circuit or network in communications or signalling devices, in one very important way. That important aspect is: (1) resistance (2) propagation delay (3) inductive reactance (4) capacitive reactance

1037. What commonly available antenna feed line can be buried directly in the ground for some distance without adverse effects? (1) 75 ohm twin-lead (2) 300 ohm twin-lead (3) 600 ohm open-wire (4) coaxial cable

1038. What kind of antenna feed line can be constructed using two conductors which are maintained a uniform distance apart using insulated spreaders? (1) 75 ohm twin-lead (2) 300 ohm twin-lead (3) 600 ohm open-wire (4) coaxial cable

1039. The lowest loss feed line on HF with less than 0.1 dB/100 feet at 150 MHz is: (1) 75 ohm twin-lead (2) 300 ohm twin-lead (3) open-wire (4) coaxial cable

1040. When antenna feed lines must be placed near grounded metal objects, which of the following feed lines should be utilized? (1) 75 ohm twin-lead (2) 300 ohm twin-lead (3) 600 ohm open-wire (4) coaxial cable

1041. TV twin-lead feed line can be used for a feed line in an amateur station. The impedance of this line is approximately: (1) 50 ohms (2) 70 ohms (3) 300 ohms (4) 600 ohms

1042. A resonant antenna having a feed point impedance of 200 ohms is connected to a feed line and transmitter which have an impedance of 50 ohms. What will the standing wave ratio of this system be? (1) 3:1 (2) 4:1 (3) 5:1 (4) 6:1

1043. The type of feed line best suited to operating at a high standing wave ratio is: (1) 75 ohm twin-lead (2) 300 ohm twin-lead (3) 600 ohm open-wire (4) coaxial line

1044. As standing wave ratio rises so does the loss in the transmission line. This is caused by: (1) leakage to ground through the dielectric (2) high antenna currents (3) high antenna voltage (4) dielectric and conductor heat losses

1045. What is the effective radiated power of an amateur transmitter if the transmitter output power is 200 watts, the antenna transmission line loss is 5 watts and the antenna power gain is 3 dB? (1) 178 watts (2) 197 watts (3) 228 watts (4) 390 watts

1046. Effective radiated power means the: (1) power supplied to the antenna before the modulation of the carrier (2) transmitter output power, minus line losses, plus antenna gain (3) power supplied to the antenna, plus antenna gain (4) ratio of signal output power to signal input power

1047. The power supplied to the antenna transmission line by a transmitter during an RF cycle at the highest crest of the modulation envelope is known as: (1) peak envelope power (2) mean power (3) carrier power (4) full power

1048. The polarization of a radio wave is taken as the direction of the lines of force in the _____ field: (1) electric (2) electromagnetic (3) force (4) magnetic

1049. The velocity factor of a transmission line is referred to as the: (1) impedance of the line, e.g., 50 ohm, 75 ohm, etc. (2) ratio of the velocity of propagation in a transmission line to the velocity of propagation in free space (3) speed at which the signal travels in free space (4) speed to which the standing waves are reflected back to the transmitter

1050. An isotropic antenna is: (1) an antenna to be used for very low frequencies because of its design (2) a hypothetical antenna used for comparing properties of actual antennas (3) a common type of half-wave dipole used in the amateur bands (4) said to have a 2.1 dB gain over a half-wave dipole

1051. A transmitted wave is vertically polarized when: (1) its magnetic component is vertical (2) the aerial is pointing north in the northern hemisphere (3) the aerial is parallel to the ground (4) its electrical component is vertical

1052. The wavelength corresponding to a frequency of 2 MHz is: (1) 30 m (2) 150 m (3) 360 m (4) 1,500 m

1053. At resonance, a half-wave dipole aerial in free space has an input impedance that is: (1) equal to the characteristic impedance of the feeder (2) equal to the output impedance of the transmitter (3) a pure resistance (4) a pure reactance

1054. The characteristic impedance of a transmission line is: (1) the impedance of a section of the line one wavelength long (2) equal to the pure resistance which, if connected to the end of the line, will

absorb all the power arriving along it (3) the dynamic impedance of the line at the operating frequency (4) the ratio of the power supplied to the line to the power delivered to the termination

1055. A quarter-wave stub, for use at 15 MHz, is made from a coaxial cable having a velocity factor of 0.8. Its physical length will be: (1) 4 m (2) 7.5 m (3) 8 m (4) 12 m

1056. The polarisation of an antenna is the: (1) direction of its radiated magnetic field (2) direction of its radiated electric field (3) length of the radiating element (4) radiation angle

1057. Signals from a mobile station using a vertical whip antenna will normally be best received using a: (1) horizontal dipole antenna (2) vertical ground plane antenna (3) horizontal ground plane antenna (4) random length of wire

1058. A dipole antenna will emit a vertically polarized wave if it is: (1) too near to the ground (2) fed with the correct type of RF (3) mounted vertically (4) parallel with the ground

1059. If an electromagnetic wave leaves an antenna vertically polarized, it will arrive at the receiving antenna, by ground wave: (1) vertically polarized (2) polarized in any plane (3) polarized at right angles to original (4) horizontally polarized

1060. Compared with a horizontal antenna, a vertical antenna will receive a vertically polarized radio wave: (1) at greater strength (2) at weaker strength (3) without any comparative difference (4) if the antenna changes the polarization

1061. A transmitter has an output power of 200 watts. The coaxial and connector losses are 3 dB in total, and the antenna gain is 9 dB. What is the approximate effective radiated power of this system? (1) 400 watts (2) 800 watts (3) 1600 watts (4) 3200 watts

1062. The name for an antenna which does not require a ground for its operation is called a: (1) Siemens (2) Hertz (3) Marconi (4) Maxwell

1063. Which of the following statements is false? An isotropic antenna is: (1) equal in gain to a dipole antenna (2) a point source whereby radiation is uniform in all directions (3) used as a reference only (4) a hypothetical antenna

1064. A transmitter has a power output of 100 watts. There is a loss of 1.30 dB in the transmission line, a loss of 0.2 dB through the transmatch, and a gain of 4.50 dB in the antenna. The effective radiated

power (ERP) is: (1) 100 watts (2) 200 watts (3) 400 watts (4) 800 watts


1065. The power of a transmitter is increased from 5 watts to 500 watts by a linear amplifier. The power gain, expressed in dB, is: (1) 20 dB (2) 10 dB (3) 30 dB (4) 40 dB


1066. When a half-wave dipole antenna is installed one-half wavelength above ground, the: (1) vertical or upward radiation is cancelled (2) radiation pattern changes to produce side lobes at 15 and 50 degrees (3) side lobe radiation is cancelled (4) radiation pattern is unaffected


1067. The characteristic impedance of a parallel wire transmission line does not depend on the: (1) velocity of energy on the line (2) radius of the conductors (3) centre to centre distance between conductors (4) dielectric


1068. The standing wave ratio (SWR) between the transmission line and the load is minimum when: (1) the power applied to the line is dissipated in the load (2) the reflected power is maximum (3) the dummy load is a pure resistance (4) a balun is used between the transmission line and the load


1069. The feed point in a centre-fed half-wave antenna is at the point of: (1) maximum current (2) maximum voltage (3) minimum current (4) minimum voltage and current


1070. Antenna beamwidth is an angle formed from the antenna to: (1) the points on the major lobe at the half-power points (2) the maximum lobe spread points on the major lobe (3) the 6 dB power points on the major lobe (4) the 3 dB power points on the first minor lobe


1071. The front-to-back ratio of a beam antenna is: (1) the maximum forward power in the major lobe to the maximum backward power radiation (2) the forward power at the 3 dB points to the power radiated in the backward direction (3) the forward power of the major lobe to the power in the backward direction, both being measured at the 3 dB points (4) undefined


1072. A waveguide could be analyzed as a two-conductor transmission line supported by: (1) an infinite number of quarter-wavelength insulating stubs (2) an infinite number of half-wave insulating stubs (3) ceramic insulators (4) an infinite number of full-wave stubs


1073. Resonant cavities are used by amateurs as a: (1) narrow bandpass filter at VHF frequencies and superiors (2) as a high pass-filter above 30 MHz (3) as a low pass-filter below 30 MHz (4) as a power line filter

1074. A parabolic antenna is very efficient because: (1) all the received energy is focused to a point where the pick-up antenna is located (2) a dipole antenna can be used to pick up the received energy (3) no impedance matching is required (4) a horn-type radiator can be used to trap the received energy

1075. A helical-beam antenna with right-hand polarization will receive signals with: (1) left-hand polarization (2) right-hand polarization (3) vertical polarization only (4) horizontal polarization

1076. An antenna which will respond simultaneously to vertically- and horizontally-polarized signals is a: (1) helical-beam antenna (2) folded dipole antenna (3) ground-plane antenna (4) quad antenna

1077. When compared to an isotropic antenna, a dipole has a gain of: (1) 1.10 dBi (2) 1.7 dBi (3) 2.10 dBi (4) 4.10 dBi

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Feedback, Comments To: J.P. Sweeney

VIb) POWER SUPPLIES

 2001. RF and AF chokes are rated according to: (1) power loss (2) reactance at 1,000 Hz (3) inductance and current-handling capacity (4) breakdown voltage

 2002. For the same transformer secondary voltage, which rectifier has the highest average output voltage? (1) selenium (2) full-wave (3) bridge (4) half-wave

 2003. The output of a full-wave rectifier is easier to filter than that of a half-wave rectifier because it: (1) average voltage is less (2) ripple frequency is higher (3) ripple frequency is lower (4) average current is less

 2004. Using an adequate filter in each case, with a capacitor input and the same transformer, a full-wave rectifier has (compared to a half-wave rectifier): (1) a greater output voltage but less available current (2) less output voltage but greater available current (3) greater output voltage and available current (4) the same output voltage and available current

 2005. The advantage of the capacitor input filter over the choke input filter is: (1) a higher terminal voltage output (2) better filtering action or smaller ripple voltage (3) improved voltage regulation (4) lower peak rectifier currents

 2006. A single capacitor is used as a filter. When the load is removed, the output voltage: (1) increases to peak AC input of rectifier (2) decreases to zero (3) remains the same (4) varies with the line

 2007. The main purpose of the bleeder resistor in a DC power supply is to: (1) ensure good ripple filtering in the output (2) discharge the filter capacitors when the supply is turned off (3) provide current overload protection (4) provide voltage overload protection

 2008. The output of a half-wave rectifier supply will provide: (1) alternating current (2) alternating direct current (3) pure direct current (4) pulsating direct current

 2009. In a power-line operated full-wave voltage doubler, a resistor is used in series with each of the diodes. The purpose is to: (1) limit the surge current through the rectifiers (2) provide load stability for the secondary of the transformer (3) decrease the voltage on the rectifiers (4) provide proper regulation of voltage and current through the supply

 2010. In a series-regulated power supply, the power dissipation of the pass transistor is: (1) directly

proportional to the load current and the input/output voltage differential (2) indirectly proportional to the load voltage and the input/output voltage differential (3) the inverse of the load current and the input/output voltage differential (4) dependent upon the peak inverse voltage appearing across the Zener diode

2011. In any regulated power supply, the output is cleanest and regulation is best: (1) at the output of the pass transistor (2) across the secondary of the pass transistor (3) across the load (4) at the point where the sampling network or error amplifier is connected

2012. The ability of a Zener diode to stabilize a voltage in a power supply depends upon the: (1) internal resistance of the diode (2) conducting impedance of the diode (3) peak inverse voltage present in the circuit (4) pass transistors' ability to maintain current flow

2013. The most common primary cell in use today is the carbon-zinc or flashlight cell. This cell can be recharged: (1) once (2) twice (3) many times (4) never

2014. All storage batteries have discharge limits and nickel-cadmium, the type most used in small hand-held portables, should not be discharged to less than: (1) 0.2 volt per cell (2) 0.5 volt per cell (3) 1.5 volt per cell (4) 1.0 volt per cell

2015. A 1500 volt supply requires approximatively 50 mF of filtering in the output of the bridge rectifier. In your "junk box" you find 6 electrolytic capacitors all rated at 450 volts, one at 50 mF, one at 100 mF and four at 200 mF. Which of the following (choices) would give you what is required for the filtering? (1) one 50 mF (2) one 50, one 100, and two 200 mF (3) one 100 and two 200 mF (4) four 200 mF

2016. There are two types of filters in general use in a power supply. They are called: (1) choke output and capacitor input (2) choke input and capacitor input (3) choke output and capacitor output (4) choke input and capacitor output

2017. Direct current for use in amateur equipment may be derived from many sources. Choose the INCORRECT answer subject to current physics: (1) hydroelectric power (2) nuclear power (3) battery power (4) broadcast power

2018. Power-line voltages have been made standard over the years and the voltages generally supplied to homes are approximately: (1) 105 and 210 volts (2) 110 and 220 volts (3) 115 and 230 volts (4) 125 and 250 volts

2019. So-called “transformerless” power supplies are used in some applications (notably AC-DC radios and some TV receivers). When working on such equipment, one should be very careful because: (1) the load across the power supply is variable (2) DC circuits are negative relative to the chassis (3) chassis connections are grounded by the centre pin of the power source’s plug (4) one wire of the power cord is connected to the chassis

2020. If household voltages are consistently high or low at your location, it can be corrected by the use of: (1) a full-wave bridge rectifier (2) a proper load resistance (3) an autotransformer (4) a variable voltmeter

2021. In the output of a half-wave power supply, considerable filtering is required to provide an adequately smooth DC output. This is because the: (1) load resistance varies more with half-wave rectification (2) PIV bucks the DC pulses from the rectifier (3) amplitude of the pulses is low (4) frequency of the pulses is low

2022. In a half-wave power supply with a capacitor input filter and a load drawing little or no current, the PIV across the diode can reach _____times volts rms: (1) 0.45 (2) 1.4 (3) 2.8 (4) 5.6

2023. A full-wave centre-tap power supply makes use of both halves of the AC cycle, but to accomplish this: (1) you must use a transformer with a centre-tapped secondary (2) you must use diodes double the size of the half-wave supply in the rectifier circuit (3) the filter circuit must have choke input (4) you must use a transformer with a centre-tapped primary

2024. In a full-wave centre-tap power supply, the PIV rating of the diodes must be _____ times volts rms voltage between the centre tap and either winding end: (1) 0.636 (2) 1.4 (3) 2.8 (4) 0.707

2025. The frequency of the output of the full-wave centre-tap rectifier circuit compared with the half-wave rectifier circuit is: (1) one-half (2) the same (3) double (4) triple

2026. A full-wave bridge rectifier circuit makes use of both halves of the AC cycle, but unlike the full-wave centre-tap rectifier circuit it does not require: (1) diodes across each leg of the transformer (2) a centre-tapped secondary on the transformer (3) a centre-tapped primary on the transformer (4) any output filtering

2027. The output waveform from a full-wave bridge rectifier circuit will appear to be: (1) half that of the full-wave centre-tap rectifier (2) the same as the half-wave rectifier (3) the same as the full-wave centre-tap rectifier (4) double that of the full-wave centre-tap rectifier

2028. Filters are required between the rectifier and the load to: (1) provide a constant impedance match (2) protect the load from a short circuit in the rectifiers (3) provide PIV protection for the rectifiers (4) smooth out the pulsations into an essentially constant voltage

2029. Power supply filters are essentially: (1) low-pass devices (2) high-pass devices (3) band-pass devices (4) band reject devices

2030. When discussing a power supply the _____ is equal to the output voltage divided by the total current drawn, including the current drawn by the bleeder resistor: (1) differential resistance (2) ideal resistance (3) rectifier resistance (4) load resistance

2031. The design of a filter for a power supply depends upon three of the following. Choose the INCORRECT answer: (1) the DC voltage output (2) the voltage regulation (3) the current and voltage rating of the transformer (4) the maximum load current rating

2032. The regulation of long-term changes in the load resistance of a power supply is called: (1) static regulation (2) dynamic regulation (3) analog regulation (4) active regulation

2033. The regulation of short-term changes in the load resistance of a power supply is called: (1) static regulation (2) dynamic regulation (3) analog regulation (4) active regulation

2034. The dynamic regulation of a power supply is improved by increasing the value of: (1) the choke (2) the bleeder resistor (3) the input capacitor (4) the output capacitor

2035. The main function of the bleeder resistor in a power supply is to provide a discharge path for the capacitor in the power supply. But it may also be used for a secondary function and that function is to: (1) inhibit the flow of current through the supply (2) provide a ground return for the transformer (3) improve voltage regulation (4) act as a secondary smoothing device in conjunction with the filter

2036. The alternating component in the output of a power supply is called the: (1) rise time (2) average voltage (3) rms voltage (4) ripple

2037. In a power supply, series chokes will: (1) readily pass the DC and the AC component (2) readily pass the DC but will impede the flow of the AC component (3) impede the passage of DC but will pass the AC component (4) impede both DC and AC

2038. In a power supply, shunt capacitors will: (1) readily pass the AC and DC (2) readily pass the DC but will impede the flow of the AC component (3) stop the DC but will pass the AC component (4) will stop both AC and DC

2039. The ripple frequency produced by a full-wave power supply connected to a normal household circuit is: (1) 30 Hz (2) 60 Hz (3) 90 Hz (4) 120 Hz

2040. The ripple frequency produced by a half-wave power supply connected to a normal household circuit is: (1) 30 Hz (2) 60 Hz (3) 90 Hz (4) 120 Hz

2041. Capacitor input filters: (1) produce a relatively high output voltage with respect to the transformer voltage (2) will give excellent regulation with all types of rectifiers (3) produce a relatively low output voltage in respect to the transformer voltage (4) are especially useful when the rectifier load resistance is low

2042. The output capacitor, in a power supply filter used to provide power for s SSB or CW transmitter, will give the best dynamic range if: (1) it is placed in series with other capacitors (2) the negative terminal of the electrolytic is connected to the positive and the positive terminal to ground (3) a battery is placed in series with the output capacitor (4) the output capacitance is increased

2043. If several capacitors of equal capacity and voltage rating are arranged in series across the output of a power supply, they will be able to withstand: (1) the total of the string's rated voltages (2) half of the total of the string's rated voltages (3) only the highest voltage for which any single capacitor in the string is rated (4) only the lowest voltage for which any single capacitor in the string is rated

2044. The working voltage of a capacitor is the voltage that: (1) it will withstand 95 percent of the time (2) it will withstand 50 percent of the time (3) is equal to 5 times the time constant (4) it will withstand continuously

2045. Each time a power supply is turned on, assuming the input filter capacitor has been discharged, the rectifiers are looking into: (1) a high resistance of the bleeder resistor to ground (2) essentially a short circuit (3) an open circuit (4) the resistance of the load

2046. A Zener diode is a device used to: (1) regulate voltage (2) dissipate voltage (3) decrease current (4) increase current

2047. If a Zener diode rated at 10 V and 50 watts were operated at maximum dissipation rating, it

would conduct _____ amperes: (1) 0.05 (2) 0.5 (3) 5 (4) 50

 2048. The power-handling capability of most Zener diodes is rated at 25 degrees C or approximately room temperature. If the temperature is increased, the power handling capability is: (1) much greater (2) slightly greater (3) the same (4) less

 2049. When extremely low ripple is required, or when the voltage supplied to the load must remain constant under conditions of large fluctuations of current and line voltage, a closed-loop amplifier is used to regulate the supply. There are two main categories of electronic regulators. They are: (1) non-linear and switching (2) linear and switching (3) linear and non-linear (4) “stiff” and switching

 2050. A modern type of regulator, which features a reference, high-gain error amplifier, temperature-compensated voltage, sensing resistors and transistors as well as a pass-element is commonly referred to as a: (1) twenty-four pin terminal regulator (2) six-terminal regulator (3) nine-pin terminal regulator (4) three-terminal regulator

 2051. Full-wave voltage doublers: (1) use less power than half-wave doublers (2) are used only in high-frequency power supplies (3) use both halves of an AC wave (4) create four times the half-wave voltage output

 2052. The principal function of the filter network in a power supply is to: (1) reduce the output voltage to a working level (2) regulate the output (3) smooth out the ripple after rectification (4) provide a constant load for the power supply

 2053. A Zener diode acts much in the same way as a: (1) bleeder resistor (2) gaseous regulator tube (3) common collector circuit (4) bandpass filter

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VE7UBC HOME PAGE

Feedback, Comments To: J.P. Sweeney

VIc) RECEIVERS

3001. The three main parameters against which the quality of a receiver is measured are: (1) selectivity, stability and frequency range (2) sensitivity, selectivity and stability (3) sensitivity, stability and cross-modulation (4) sensitivity, selectivity and image rejection

3002. The ability of a receiver to reject unwanted signals is called its: (1) frequency range (2) sensitivity (3) stability (4) selectivity

3003. The mixer stage of a superheterodyne receiver is used to: (1) remove image signals from the receiver (2) allow a number of IF frequencies to be used (3) change the frequency of the incoming signal to that of the IF (4) produce an audio frequency for the speaker

3004. What is the term used for the decibel difference (or ratio) between the largest tolerable receiver input signal (without causing audible distortion products) and the minimum discernible signal (sensitivity)? (1) stability (2) noise figure (3) design parameter (4) dynamic range

3005. Distortion in a receiver that only affects strong signals usually indicates a defect in the: (1) AGC (2) RF amplifier (3) IF amplifier (4) AF amplifier

3006. The lower the receiver noise figure becomes, the greater will be the receiver's: (1) stability (2) sensitivity (3) selectivity (4) rejection of unwanted signals

3007. One of the greatest advantages of the double-conversion over the single-conversion receiver is that it: (1) is much more stable (2) produces a louder signal at the output (3) is much more sensitive (4) suffers less from image interference

3008. Intermodulation distortion is produced by: (1) the mixing of more than one signal in the first or second intermediate frequency amplifiers of a receiver (2) the mixing of more than one signal in the mixer of a superheterodyne receiver (3) the interaction of products from high-powered transmitters in the area (4) the high-voltage stages in the final amplifier of an amplitude- or frequency-modulated transmitter

3009. Three of the following answers are direct causes of instability in a receiver. Choose the answer which is NOT correct: (1) temperature (2) mechanical strength (3) feedback components (4) dial tracking

3010. In a superheterodyne receiver with AGC, as the strength of the signal increases, the AGC: (1)

reduces the receiver gain (2) increases the receiver gain (3) distorts the signal (4) introduces limiting

 3011. A superheterodyne receiver designed for SSB reception must have a beat-frequency oscillator (BFO) because: (1) the suppressed carrier must be replaced for detection (2) it phases out the unwanted sideband signal (3) it reduces the pass-band of the IF stages (4) it beats with the receiver carrier to produce the missing sideband

 3012. The noise generated in a receiver of good design originates in the: (1) RF amplifier and mixer (2) IF amplifier and detector (3) BFO and detector (4) detector and AF amplifier

 3013. Poor stability in a receiver usually originates in the: (1) RF amplifier (2) mixer (3) detector (4) local oscillator and power supply

 3014. Why are very low noise figures for the sensitivity of a high frequency receiver relatively unimportant? (1) the use of SSB and CW on the HF bands overcomes the noise (2) regardless of the front end, the succeeding stages when used on HF are very noisy (3) ionospheric distortion of the received signal creates high noise levels (4) the external noise, man-made and natural, are higher than the internal noise generated by the receiver

 3015. If a radio receiver receives but can not separate a number of stations, it is said to be: (1) unstable (2) unselective (3) unmodulated (4) insensitive

 3016. The ability of a receiver to separate signals close together in frequency is referred to as its: (1) bandspread (2) sensitivity (3) stability (4) selectivity

 3017. A receiver with high selectivity has a relatively: (1) wide bandwidth (2) wide tuning range (3) narrow bandwidth (4) narrow tuning range

 3018. Selectivity of a superheterodyne communications receiver is achieved for the most part in the: (1) first oscillator (2) mixer (3) IF amplifiers (4) audio stages

 3019. In a communications receiver, a crystal filter would be located in the: (1) local oscillator (2) IF circuits (3) audio output stage (4) detector

 3020. Selectivity can be increased in a superheterodyne receiver by: (1) using a crystal filter in the IF stages (2) increasing the voltage applied to the IF stages (3) reducing the number of IF stages (4) using a higher frequency for the IF

3021. If a tuned circuit is used as a filter, greater selectivity is produced by: (1) increasing the signal input to the filter (2) increasing the Q of the circuit (3) decreasing the Q of the circuit (4) increasing the current flow through the circuit

3022. The degree of selectivity in a circuit is determined by the _____ of a filter network: (1) loading (2) noise figure (3) bandwidth (4) overload point

3023. The bandwidth of a filter network is normally specified for the MINUS 3 dB power points on the filter response curve. This corresponds to the frequencies elsewhere in the pass-band that are _____ the peak output power of the filter: (1) one-third of (2) one-half of (3) equal to (4) double

3024. The bandwidth of an IF filter is specified as being 500 Hz. This means the: (1) total bandwidth of the filter is 500 Hz (2) only frequency passed by the filter is 500 Hz (3) flat part of the filter response curve is 500 Hz wide (4) the width of the pass-band at half-peak power output is 500 Hz

3025. A communications receiver has four filters installed in it, one at 250 Hz, one at 500 Hz, one at 2.4 kHz and one at 6.0 kHz. If you were listening to single sideband, which filter would you utilize? (1) 250 Hz (2) 500 Hz (3) 2.4 kHz (4) 6.0 kHz

3026. A communications receiver has four filters installed in it, one at 250 Hz, one at 500 Hz, one at 2.4 kHz and one at 6.0 kHz. If you were listening to double sideband full carrier (AM), which filter would you normally use? (1) 250 Hz (2) 500 Hz (3) 2.4 kHz (4) 6.0 kHz

3027. A communications receiver has four filters installed in it, one at 250 Hz, one at 500 Hz, one at 2.4 kHz and one at 6.0 kHz. You are copying a CW transmission and there is a great deal of interference. Which one of the filters would you choose? (1) 250 Hz (2) 500 Hz (3) 2.4 kHz (4) 6.0 kHz

3028. Selectivity can be placed in the audio stages of a receiver by the utilization of RC active or passive audio filters. If you were to copy SSB which of the following bandpasses would you choose? (1) 750 - 850 Hz (2) 100 - 1,100 Hz (3) 300 - 2,700 Hz (4) 2,100 - 2,300 Hz

3029. Selectivity can be placed in the audio stages of a receiver by the utilization of RC active of passive audio filters. If you were to copy CW which of the following bandpasses would you choose? (1) 750 - 850 Hz (2) 100 - 1,100 Hz (3) 300 - 2,700 Hz (4) 2,100 - 2,300 Hz

3030. In addition to audio and IF selectivity, there are two other sections of the receiver that can be designed to assist the selection of one frequency or band of frequencies while rejecting others. These

sections are: (1) the detector and the local oscillator (2) the detector and the BFO (3) the RF amplifier and the local oscillator (4) the RF amplifier and the BFO

 3031. On VHF and above, quarter-wavelength coaxial cavities are used to give protection from high-level signals. For a frequency of approximately 50 MHz, the diameter of such a device would be about four inches (10 cm). What would its approximate length be? (1) 2 ft./0.6 metre (2) 5 ft./1.5 metres (3) 8 ft./2.4 metres (4) 12 ft./3.7 metres

 3032. A device which helps with receiver overload and spurious responses at VHF, UHF and above may be installed in the receiver front end. It is becoming more popular in both amateur and commercial services. It is called a: (1) duplexer (2) diplexer (3) directional coupler (4) helical resonator

 3033. The term which relates specifically to the amplitude levels of multiple signals that can be accommodated during reception is called: (1) noise figure (2) AGC (3) cross-modulation index (4) dynamic range

 3034. Poor dynamic range of a receiver can cause many problems when a strong signal appears within the front-end bandpass or even outside it. Three of the following are problems which are caused as a direct result. Choose the INCORRECT answer: (1) cross-modulation (2) desensitization (3) intermodulation (4) feedback

 3035. Nearly all of the present-day communications receivers are of what type? (1) tuned radio frequency (TRF) (2) autodyne (3) direct conversion (4) superheterodyne

 3036. The greatest significant change in the superheterodyne receiver in the past few years has been the introduction of semiconductors to replace the vacuums tubes. Three of the following four answers are direct results of this change. Choose the INCORRECT answer: (1) increased life span of the equipment (2) improved overall efficiencies (3) improved stability (4) increased size of the power supply

 3037. A multiconversion superheterodyne receiver is more susceptible to spurious responses than a single-conversion receiver because of the: (1) poorer selectivity in the IF caused by the multitude of frequency changes (2) additional oscillators and mixing frequencies involved in the design (3) greater sensitivity introducing higher levels of RF to the receiver (4) AGC being forced to work harder causing the stages concerned to overload

 3038. Normally, front-end selectivity is provided by the resonant networks both before and after the RF stage in a superheterodyne receiver. This whole section of the receiver is often referred to as the: (1) preamplifier (2) preamble (3) preselector (4) pass-selector

3039. In the first RF stage, the incoming signal is: (1) heterodyned (2) amplified (3) detected (4) mixed

3040. The first mixer in the receiver mixes the incoming signal with the local oscillator to produce: (1) a HFO frequency (2) an audio frequency (3) a radio frequency (4) an intermediate frequency

3041. If the incoming signal to the mixer is 3,600 kHz and the first IF is 9.0 MHz, at which one of the following frequencies would the HFO operate? (1) 3,400 kHz (2) 5,400 kHz (3) 10,600 kHz (4) 21,600 kHz

3042. Most superheterodyne receivers operating on the broadcast bands through to 30 MHz use a standard intermediate frequency (IF) of: (1) 200 kHz (2) 355 kHz (3) 455 kHz (4) 500 kHz

3043. The amplified IF signal is applied to the _____ stage in a superheterodyne receiver: (1) detector (2) HFO (3) RF amplifier (4) audio output

3044. The low-level output of a detector is: (1) fed directly to the speaker (2) grounded via the chassis (3) applied to the AF amplifier (4) applied to the RF amplifier

3045. The BFO is off-set slightly (500 - 1,500 Hz) from the incoming signal to the detector. This is required: (1) to pass the signal without interruption (2) to beat with the incoming signal (3) to provide additional amplification (4) to protect the incoming signal from interference

3046. The speaker and headphones both change electrical energy to mechanical vibrations. These devices are known as: (1) transverters (2) transceivers (3) trifiliars (4) transducers

3047. The overall output of a AM/CW/SSB receiver can be adjusted by means of manual controls on the receiver or by use of a circuit known as: (1) automatic gain control (2) automatic load control (3) inverse gain control (4) automatic frequency control

3048. The automatic gain control derives its sample energy for the AGC amplifier from: (1) the RF and AF amplifiers (2) the RF or AF amplifiers (3) the IF and AF amplifiers (4) the IF or AF amplifiers

3049. AGC voltage is applied to the: (1) RF and IF amplifiers (2) AF and IF amplifiers (3) RF and AF amplifiers (4) detector and AF amplifiers

3050. When a very strong signal is applied to the receiver, the AGC circuit: (1) lowers the voltage applied to the AF and RF amplifiers (2) lowers the voltage applied to the RF and IF amplifiers (3) increases the voltage applied to the RF and IF amplifiers (4) increases the voltage applied to the AF and RF amplifiers

3051. AGC is derived in a receiver from one of two circuits. Depending on the method used it is called: (1) RF derived or audio derived (2) detector derived or audio derived (3) IF derived or audio derived (4) IF derived or RF derived

3052. It is very important that the oscillators contained in a superheterodyne receiver are: (1) stable and sensitive (2) sensitive and selective (3) stable and spectrally pure (4) selective and spectrally pure

3053. FM receivers perform in an unusual manner when two or more stations are present. The loudest signal, even though it is only two or three times as loud as the other signals, will be the only transmission demodulated. This is called: (1) attach effect (2) capture effect (3) interference effect (4) surrender effect

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VE7UBC HOME PAGE

Feedback, Comments To: J.P. Sweeney

VId) TRANSMITTERS

4001. Carrier suppression in a single-sideband transmitter takes place in: (1) the mechanical filter (2) the frequency multiplier stage (3) the carrier decouple stage (4) the balanced modulator stage

4002. The upper and lower sidebands of an amplitude modulated carrier are: (1) unequal in bandwidth (2) mirror images of one another (3) inversely proportional to each other (4) equal in frequency and phase

4003. Maintaining the peak RF output of a SSB transmitter at a relatively constant level requires a circuit called the: (1) automatic gain control (AGC) (2) automatic level control (ALC) (3) automatic output control (AOC) (4) automatic volume control (AVC)

4004. The characteristic difference between a phase modulator and a frequency modulator is: (1) frequency inversion (2) the centre frequency (3) de-emphasis (4) pre-emphasis

4005. In most modern FM transmitters, to produce a better sound, a compressor and a clipper are placed: (1) between the modulator and the oscillator (2) between the multiplier and the PA (3) between the audio amplifier and the modulator (4) in the microphone circuit before the audio amplifier

4006. Which principle governs the operation of a crystal microphone? (1) mutual induction (2) piezoelectric effect (3) capacitative reactance (4) variable resistance

4007. The output tuning controls on a transmitter power amplifier: (1) allow efficient transfer of power to the antenna (2) are involved with frequency multiplication in the previous stage (3) allow switching to different antennas (4) reduce the possibility of cross-modulation in adjunct receivers

4008. The cancelling of positive feedback and the resultant regeneration process is accomplished in vacuum tube amplifiers by: (1) compandoring (2) sonometers (3) a pi-network (4) neutralization

4009. To compute one of the following, multiply the peak-envelope voltage by 0.707 to obtain the rms value, square the result and divide by the load resistance. Which is the correct answer? (1) ERP (2) power factor (3) PEP (4) PIV

4010. We have all used the term ASCII, when using computers or teletypewriting equipment. For what does the term actually stand? (1) American National Standard Code for Information Interchange (2) Amalgamated System Code for Information Interchange (3) A Standard Code for Information

Interchange (4) North American System Compatible with International Interchange

4011. In Diagram 8, the purpose for RFC is to: (1) act as a high impedance at the input to the transistor (2) resonate with C1 (3) provide a DC bias for the transistor (4) form a low-pass filter

4012. In Diagram 8, C1 is used as a: (1) by-pass for the circuit (2) part of the input tuned circuit (3) DC blocking capacitor (4) part of the output tank circuit

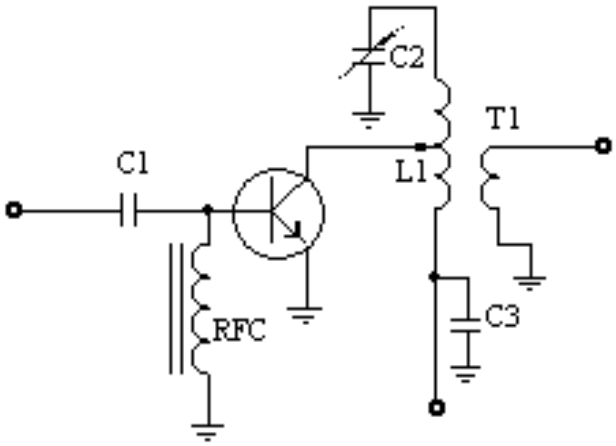
4013. In Diagram 8, the circuit must be operated in: (1) class A (2) class AB (3) class B (4) class C

4014. In Diagram 8, C2 is used to: (1) by-pass RF (2) tune L1 to the desired harmonic (3) tune L1 to the frequency applied to the base (4) provide positive feedback

4015. In Diagram 8, the purpose of C3 is to: (1) keep RF out of the power supply (2) by-pass any audio components (3) resonate with L1 (4) form a pi filter with L1 and C2

4016. In Diagram 8, C2 in conjunction with L1 operate as a: (1) voltage divider (2) voltage doubler (3) frequency divider (4) frequency multiplier

Diagram 8



4017. The purpose of J1 in Diagram 7 is to: (1) plug in the key (2) filter the Vcc (3) plug in the next amplifier (4) maintain Vcc on Q1

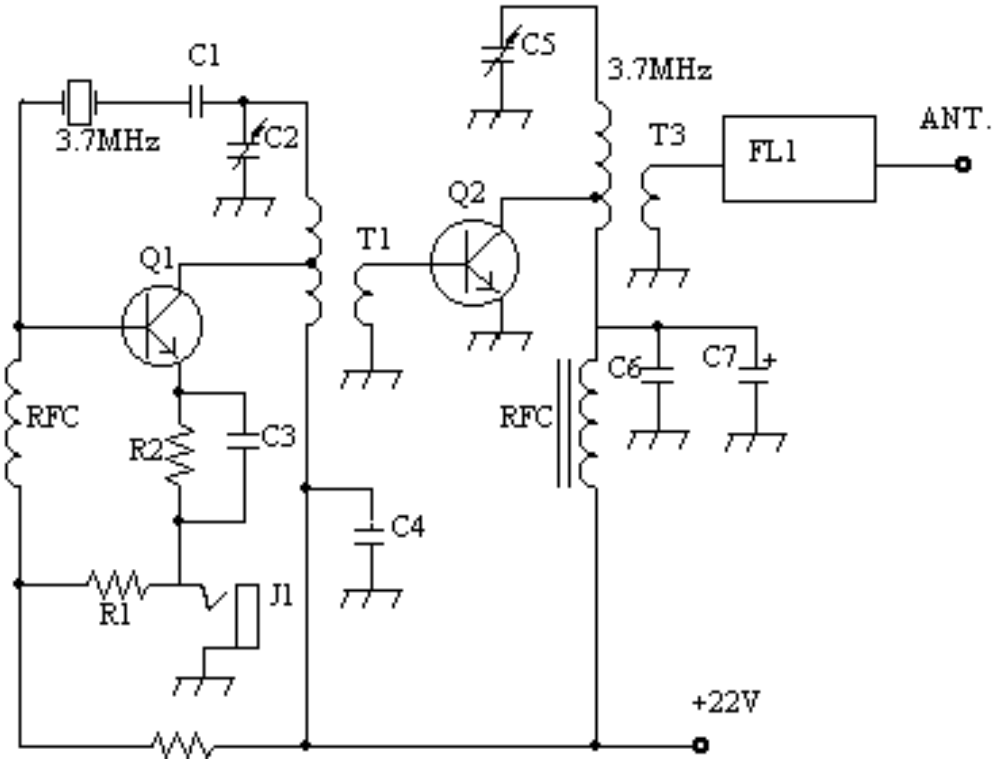
4018. The purpose of C4 in Diagram 7 is: (1) to by-pass audio (2) to by-pass RF (3) to provide oscillator feedback (4) to resonate with T1

4019. A purpose of T1 in Diagram 7 is to: (1) form a tuned circuit with C2 (2) act as part of a balanced mixer (3) act as part of a pi filter (4) provide the necessary feedback for oscillation

4020. RFC2, C6 and C7 in Diagram 7: (1) form a low-pass filter (2) form a RF-tuned circuit (3) provide negative feedback (4) form a key-click filter

4021. Q2 in Diagram 7 is: (1) a power amplifier (2) an audio oscillator (3) the master oscillator (4) a frequency multiplier

Diagram 7



4022. An amplifier that is designed to produce positive feedback is called: (1) a power amplifier (2) an oscillator (3) a rectifier (4) an AF amplifier

4023. Of the following, the simplest transmitter to build would be: (1) an SSB transmitter (2) an FM transmitter (3) an AM transmitter (4) a CW transmitter

4024. In order to provide the greatest efficiency in the output stage of a CW, RTTY or FM transmitter, you would operate the amplifier: (1) class A (2) class AB (3) class B (4) class C

4025. Side-band frequencies are: (1) frequencies above the carrier frequency (2) frequencies below

the carrier frequency (3) frequencies above and below the carrier frequency and equal to the sum and difference of the modulation and carrier frequencies (4) harmonic frequencies of the carrier frequency

 4026. In a Hartley oscillator, the energy is fed back from the output circuit by: (1) tapped capacitors (2) tapped inductor (3) a series resistor (4) a transistor

 4027. If the overall gain of an amateur station is increased by 3 dB, the ERP (Effective Radiated Power) will: (1) decrease by 3 watts (2) be cut in half (3) remain the same (4) double

 4028. When the transmitter is not modulated or the amplitude of the modulating signal is zero, the frequency of the carrier is called its: (1) modulating frequency (2) frequency deviation (3) frequency shift (4) centre frequency

 4029. Frequency stability in a single-sideband (SSB) transmitter is: (1) desirable but not necessary (2) not required (3) very important (4) continually changing

 4030. The purpose of a quartz crystal in a transmitter is to: (1) suppress harmonic emissions (2) generate a signal of the correct frequency (3) attenuate spurious sidebands (4) prevent feedback of energy from a power stage to a preceding stage

 4031. The main advantage of a crystal oscillator over a tuned LC oscillator is: (1) simplicity (2) longer life under severe operating use (3) freedom from harmonic emissions (4) much greater frequency stability

 4032. The purpose of using a centre-tap return connection on the secondary of transmitting tube’s filament transformer is to: (1) prevent modulation of the emitted wave by the alternating current filament supply (2) reduce the possibility of harmonic emissions (3) keep the output voltage constant with a varying load (4) obtain optimum power output

 4033. One advantage of keying the buffer stage in a transmitter is that: (1) high RF voltages are not present (2) changes in oscillator frequency are less likely (3) key clicks are eliminated (4) the radiated bandwidth is restricted

 4034. Two types of angle modulation are: (1) phase modulation and amplitude modulation (2) phase modulation and carrier-wave modulation (3) phase modulation and frequency modulation (4) frequency modulation and amplitude modulation

4035. The centre frequency of a FM signal is defined as the: (1) frequency when the carrier is not being modulated (2) difference between the frequency carrier and the modulating (3) sum of the carrier and the modulating frequency (4) modulated carrier frequency

4036. The maximum frequency change of a FM signal is called the: (1) modulation index (2) centre frequency (3) deviation (4) frequency spectrum

4037. In a FM transmitter system, the number of cycles of deviation from the centre frequency is determined solely by the: (1) amplitude of the modulating frequency (2) frequency of the modulating frequency (3) amplitude and the frequency of the modulating frequency (4) modulating frequency and the amplitude of the centre frequency

4038. During modulation of a FM waveform: (1) no additional energy is supplied to the waveform (2) additional energy is supplied to the waveform (3) energy is taken from the modulating signal (4) no sideband frequencies are generated

4039. Any FM wave with single-tone modulation has: (1) one sideband frequency (2) two sideband frequencies (3) four sideband frequencies (4) an infinite number of sideband frequencies

4040. Three important quantities to be verified in a FM transmitter are: (1) linearity, frequency deviation and frequency stability (2) distortion, bandwidth and sideband power (3) modulation, pre-emphasis and carrier suppression (4) frequency stability, de-emphasis and linearity

4041. Narrow-band FM is defined as FM transmission that: (1) has a modulation index of one (2) has a modulation index of less than 1.5 (3) does not occupy a bandwidth greater than that of an AM signal with the same modulating frequency (4) does not occupy a bandwidth greater than 10 kHz

4042. In a SSB transmission, the carrier is: (1) transmitted with one sideband (2) of no use at the receiver (3) reinserted at the receiver (4) inserted at the transmitter

4043. Transmission with SSB, as compared to conventional AM transmission, results in: (1) 6 dB gain in the receiver (2) 3 db gain in the transmitter (3) 6 dB gain in the transmitter and 3 dB gain in the receiver (4) a greater bandpass requirement in the receiver

4044. Reflection of a SSB transmission from the ionosphere causes: (1) phase-shift distortion (2) little or no phase-shift distortion (3) signal cancellation at the receiver (4) a high-pitch squeal at the receiver

4045. A quartz crystal filter is superior to an LC filter for narrow bandpass applications because of the: (1) crystal's low Q (2) crystal's high Q (3) LC circuit's high Q (4) crystal's simplicity

4046. The automatic level control (ALC) in a SSB transmission system: (1) controls the peak audio input so that the final amplifier is not overdriven (2) reduces the system noise (3) eliminates the system distortion (4) increases the occupied bandwidth

4047. Speech compression associated with SSB transmission implies: (1) full amplification of low level signals and reducing or eliminating amplification of high level signals (2) full amplification of high level signals and reducing or eliminating signals amplification of low level (3) a lower signal-to-noise ratio (4) circuit level instability

4048. Peak-envelope power (PEP) for SSB transmission is: (1) peak-envelope voltage (PEV) multiplied by 0.707, squared and divided by the load resistance (2) peak-voltage multiplied by peak current (3) equal to the rms power (4) a hypothetical measurement

4049. Peak-envelope power (PEP) is used to express power for a: (1) single-sideband suppressed-carrier (SSBSC) transmitter (2) single-sideband reduced-carrier (SSBRC) transmitter (3) double-sideband suppressed-carrier (DSBSC) transmitter (4) double-sideband (DSB) transmitter

4050. In a multivibrator circuit, when one transistor conducts, the other is: (1) cut off (2) forward-biased (3) reverse-biased (4) amplified

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Feedback, Comments To: J.P. Sweeney

VIe) THEORY

 5001. The current flowing in a circuit is 10 mA. How many watts of power is dissipated by a circuit resistance of 100 kilohms? (1) 1 watt (2) 10 watts (3) 100 watts (4) 10,000 watts

 5002. The strength of the magnetic field around a conductor in air is: (1) directly proportional to the current in the conductor (2) inversely proportional to the voltage on the conductor (3) directly proportional to the diameter of the conductor (4) inversely proportional to the diameter of the conductor

 5003. Maximum induced voltage in a coil occurs when: (1) the magnetic field around the coil is not changing (2) the current through the coil is of a DC nature (3) current is going through its least rate of change (4) current is going through its greatest rate of change

 5004. The induced voltage that opposes the original EMF applied to a circuit is often called the: (1) source voltage (2) voltage drop (3) back EMF (4) voltage jump

 5005. The voltage induced in a magnetic field is at maximum when the movement is: (1) perpendicular to the lines of force (2) made in a clockwise direction (3) parallel to the lines of force (4) made in a counterclockwise direction

 5006. Which of the following statements is true regarding an RL circuit? (1) current cannot change instantaneously because of the resistance in the circuit (2) current changes instantaneously whenever the input voltage changes (3) voltage across the resistance changes instantaneously whenever the input voltage changes (4) current cannot change instantaneously because of the inductance in the circuit

 5007. Resonance is the condition that exists when: (1) inductive reactance is the only opposition in the circuit (2) inductive reactance and capacitance reactance are equal and opposite in sign (3) the circuit contains no resistance (4) resistance is equal to the reactance

 5008. When a series LCR circuit is tuned to the frequency of the source, the: (1) line current reaches maximum (2) impedance is maximum (3) line current leads the applied voltage (4) line current lags the applied voltage

 5009. If the Q of a resonant tank circuit is decreased, the: (1) bandwidth decreases (2) resonant frequency decreases (3) selectivity decreases (4) time constant increases

 5010. Inductive reactance may be increased by: (1) an increase in the applied voltage (2) a decrease

in the applied frequency (3) a decrease in the supplied current (4) an increase in the applied frequency

 5011. If the frequency of the waveform is 100 Hz, the time for one cycle is: (1) 1 second (2) 0.01 second (3) 0.0001 second (4) 10 seconds

 5012. If the peak value of a 100 Hz sinusoidal waveform is 20 volts, the rms value is: (1) 28.28 volts (2) 14.14 volts (3) 7.07 volts (4) 16.38 volts

 5013. A choke coil of 4.25 microhenries is used in a circuit at a frequency of 200 MHz. Its reactance is: (1) 7,540 ohms (2) 4,750 ohms (3) 5,740 ohms (4) 5,340 ohms

 5014. The capacitive reactance of a 25 microfarad condenser connected to a 60-cycle line is: (1) 1,500 ohms (2) 9,420 ohms (3) 2.4 ohms (4) 106.1 ohms

 5015. In applying Ohm’s law to AC circuits, current and voltage values are: (1) average values (2) peak values times 0.707 (3) average values times 1.414 (4) none of the above

 5016. If the frequency of the applied voltage is increased, the capacitive reactance is: (1) increased (2) remains the same (3) decreased (4) either increased or decreased

 5017. A power-supply filter has a capacitor of 10 microfarads (0.01 mF). What is the capacitive reactance of this capacitor to a frequency of 60 cycles? (1) 100 ohms (2) 200 ohms (3) 265 ohms (4) 500 ohms

 5018. A choke coil has an inductance of 60 henries. What is its inductive reactance in a 60-cycle circuit? (1) 9 kilohms (2) 1 kilohm (3) 23 kilohms (4) 28 kilohms

 5019. Inductive reactance: (1) is not changed by changes in frequency (2) varies inversely with changes in frequency (3) varies inversely as to the square of the frequency (4) varies directly with frequency

 5020. The effective value of a sine wave of voltage or current is: (1) 100% of the maximum value (2) 63.6% of the maximum value (3) 50% of the maximum value (4) 70.7% of the maximum value

 5021. The capacitance of a capacitor is: (1) directly proportional to the area of the plates (2) inversely proportional to the dielectric constant (3) directly proportional to the voltage across it (4)

directly proportional to the spacing between the plates

 5022. The ability to store electrical energy in an electrostatic field is called: (1) inductance (2) farads (3) capacitance (4) battery action

 5023. The fixed plates in a variable capacitor are called the: (1) rotors (2) dielectric (3) switching plates (4) stators

 5024. If the primary of a 110-volt power transformer consists of 1 100 turns, then a secondary winding supplying filament power for a 5-volt filament tube drawing 0.3 amps would be: (1) 20 turns (2) 70 turns (3) 50 turns (4) 7 turns

 5025. A 100% efficient transformer has a turns ratio of 1/5. If the secondary current is 50 mA, the primary current is: (1) 0.01 amp (2) 0.25 mA (3) 0.25 amp (4) 2,500 mA

 5026. A force of repulsion exists between two _____ magnetic poles: (1) unlike (2) like (3) positive (4) negative

 5027. A permanent magnet would most likely be made from: (1) steel (2) copper (3) aluminum (4) soft iron

 5028. Total resistance in a parallel circuit: (1) is always less than the smallest resistance (2) depends upon the IR drop across each branch (3) could be equal to the resistance of one branch (4) depends upon the impressed voltage

 5029. Two resistors are connected in parallel and are connected across a 40 volt battery. If each resistor is 1,000 ohms, the total current is: (1) 40 amperes (2) 40 milliamperes (3) 80 amperes (4) 80 milliamperes

 5030. The total current in a parallel circuit is equal to the: (1) current in any one of the parallel branches (2) sum of the currents through all the parallel branches (3) source voltage divided by the value of one of the resistive elements (4) source voltage divided by the sum of the resistive elements

 5031. The effect of inductance in a coil is to: (1) oppose any change in the flow of current (2) oppose and change the value of resistance (3) prevent the current from dropping to zero (4) prevent the current from being short-circuited

5032. A gold band on a resistor indicates the tolerance is: (1) 1% (2) 5% (3) 10% (4) 20%

5033. If the voltage applied to two resistors in series is doubled, how much will the total power change? (1) increase four times (2) decrease to half (3) double (4) no change

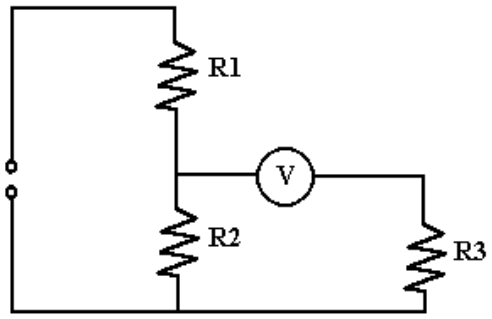
5034. A current of 10 mA flows through a 500 ohms resistor. The voltage drop developed across the resistor is: (1) 5 volts (2) 50 volts (3) 500 volts (4) 5,000 volts

5035. Calculate the value of resistance necessary to drop 100 volts with current flow of 0.8 milliamperes: (1) 125 ohms (2) 125 kilohms (3) 1,250 ohms (4) 1.25 kilohms

5036. What amount of power is consumed by a 100,000 ohm resistor when a current of 6.0 milliamperes flows through it? (1) 1.5 watts (2) 2.5 watts (3) 3.6 watts (4) 6.0 watts

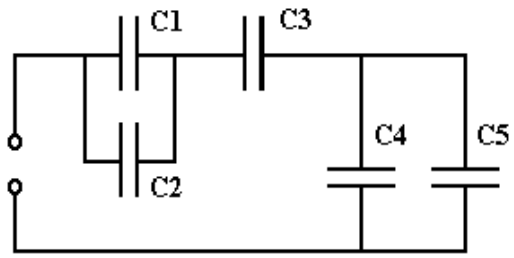
5037. In Diagram 22, R1 = 10 kilohms (kW), R2 = 500 ohms, R3 = 2 kW and meter M reads 5 mA. The applied voltage E is: (1) 260 volts (2) 52 volts (3) 75 volts (4) 210 volts

Diagram 22



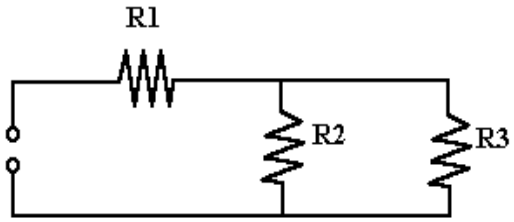
5038. In Diagram 19, if C1 = 12 mF, C2 = 3 mF, C3 = 15 mF, C4 = 10 mF and C5 = 5 mF, the total capacitance is: (1) 5 mF (2) 20 mF (3) 45 mF (4) 15 mF

Diagram 19



5039. In Diagram 20, if R1 = 10 kW, R2 = 20 kW and R3 = 20 kW, the total resistance of the circuit is: (1) 10 kW (2) 15 kW (3) 20 kW (4) 30 kW

Diagram 20



5040. In the formula X = 2pfc, the “X” represents: (1) resistance (2) impedance (3) reactance (4) resonance

5041. The total capacitance of two or more capacitors in series is: (1) always less than the smallest capacitor (2) always greater than the largest capacitor (3) found by adding each of the capacitors together (4) found by adding each of the capacitors together and dividing by the total number of capacitors

5042. I = E/R is a mathematical equation describing: (1) Ohm’s law (2) Thévenin’s theorem (3) Kirchoff’s first law (4) Kirchoff’s second law

5043. If a current of 500 milliamps passes through a resistance of 1,000 ohms, how many watts of power are utilized? (1) 0.25 (2) 2.5 (3) 25 (4) 250

5044. A resistor with a colour code of “brown, black, red” would have a value of: (1) 10 ohms (2) 100 ohms (3) 1,000 ohms (4) 10,000 ohms

5045. The abbreviation PIV means: (1) photons in vacuum (2) peak inverse voltage (3) Patoff’s inverse vector (4) peak intensity voltage

5046. The material commonly used in the make-up of a resistor is: (1) carbon (2) ceramic (3) lead (4) mica

5047. What is the colour code for a 15 kilohm resistor? (1) brown, green, black (2) brown, green, brown (3) brown, green, red (4) brown, green, orange

5048. A load which draws 3 amperes from a source having an internal resistance of 5 ohms, has a

resistance of 40 ohms. The open circuit terminal voltage of the source is: (1) 110 volts (2) 135 volts (3) 120 volts (4) 150 volts

5049. Two resistors are connected in parallel. R1 has a resistance of 75 ohms and R2 has a resistance of 50 ohms. The total resistance of this parallel circuit is: (1) 10 ohms (2) 70 ohms (3) 30 ohms (4) 40 ohms

5050. A resistor of 20 ohms has a current of 0.25 amperes flowing through it. The heat dissipation in watts is: (1) 1.25 watts (2) 5 watts (3) 2.50 watts (4) 10 watts

5051. If 200 volts is applied to a 2,000 ohm resistor, the resistor will dissipate: (1) 20 watts (2) 30 watts (3) 10 watts (4) 40 watts

5052. The effective output current of a full-wave rectifier _____ is of the peak value: (1) 1.414 (2) 0.707 (3) 0.636 (4) 2.828

5053. Resonance is an electrical property used to describe: (1) an inductor (2) the frequency characteristic of a coil and capacitor circuit (3) a set of parallel inductors (4) the results of tuning a varicap (varactor)

5054. Capacitive reactance: (1) applies only to series RLC circuits (2) decreases with frequency (3) increases with frequency (4) increases with the time constant

5055. Resistor wattage ratings are: (1) expressed in Joules per second (2) variable in steps of one hundred (3) determined by heat dissipation qualities (4) calculated according to physical size, ohms value, and tolerance

5056. If the frequency applied to an RLC circuit is increased, the capacitive reactance will: (1) increase (2) decrease (3) remain the same (4) increase by 3 dB

5057. Potential difference is measured by means of a: (1) ammeter (2) voltmeter (3) ohmmeter (4) wattmeter

5058. The reciprocal of resistance is: (1) reluctance (2) reactance (3) conductance (4) permeability

5059. Voltage drop means: (1) any point in a radio circuit which has zero voltage (2) voltage

developed across the terminals of a component (3) difference in voltage at output terminals of a transformer (4) the voltage which is dissipated before useful work is accomplished


5060. The voltage required to force a current of 4.4 amperes through a resistance of 50 ohms is: (1) 2,220 volts (2) 220 volts (3) 22.0 volts (4) 0.220 volts


5061. The resistance of a conductor changes with: (1) temperature (2) humidity (3) voltage (4) current


5062. The inductive reactance of a 30 H choke used in a 110 V, 60-cycle single-phase line is: (1) 12,407 ohms (2) 5,000 ohms (3) 28,973 ohms (4) 11,310 ohms


5063. An electrical component marked as “6.8 kilohms” would be a: (1) capacitor (2) transistor (3) dry cell (4) resistor


5064. Which one of the following devices depends on electromagnetism for its operation? (1) lead-acid cell (2) solenoid relay (3) electrolytic capacitor (4) field-effect transistor


5065. The most common material used as a resistor is: (1) lead (2) gold (3) mica (4) carbon


5066. The third colour band indicates the: (1) tolerance range (2) power value (3) multiplier (4) resistor material


5067. In the resistor colour code, the colour yellow refers to the number: (1) 2 (2) 3 (3) 4 (4) 5


5068. A resistor is marked with the colours red, violet and yellow. This resistor has a value in ohms of: (1) 274 (2) 270 k (3) 72 k (4) 27 M


5069. A device which is magnetic only when a current is flowing through it is called: (1) a magnetic field (2) an electromagnet (3) a bar magnet (4) a permanent magnet


5070. To increase the current capacity of a battery, several cells should be connected in: (1) series resonant (2) series (3) parallel resonant (4) parallel


5071. To increase the voltage output of a battery, several cells are connected in: (1) resonance (2)

parallel (3) series-parallel (4) series

5072. A parallel combination of 20, 15 and 10 mF capacitors will have a total capacitance of: (1) less than 10 mF (2) between 10 and 15 mF (3) between 15 and 20 mF (4) greater than 20 mF

5073. A capacitor acts as an open circuit to 10 Hz AC yet readily passes 10 kHz AC. This indicates that the: (1) dielectric is breaking down (2) electrostatic shielding is changing (3) copper losses are occurring (4) reactance depends on frequency

5074. An air-spaced capacitor has a high reactance to an AC signal. This means that the: (1) capacitor will tend to pass the AC (2) capacitor will tend to block the AC (3) air will become conductive to the AC (4) air will act as an insulator the to AC

5075. A component which tends to pass low frequency AC better than higher frequency AC is: (1) an inductance (2) a capacitor (3) a resistor (4) a transistor

5076. In general, the reactance of inductors increases with: (1) decreasing AC frequency (2) increasing AC frequency (3) decreasing applied voltage (4) increasing applied voltage

5077. A set of audio headphones is labelled “impedance 8 ohms”. This impedance is: (1) greater than the resistance (2) less than the reactance (3) equal to the resistance (4) equal to the reactance

5078. The fact that energy transfer from primary to secondary windings in a power transformer is not perfect is indicated by: (1) large secondary currents (2) high primary voltages (3) warm iron laminations (4) electrostatic shielding

5079. A transformer used to power a transistor radio from the main is being used to: (1) match impedance (2) reduce the voltage (3) produce less power (4) match reactances

5080. An electrostatic screen between windings on a transformer acts to: (1) increase magnetic coupling (2) increase capacitive coupling (3) decrease magnetic coupling (4) decrease capacitive coupling

5081. In a circuit, a transformer is shown connecting an amplifier stage to a speaker. This transformer is being used to match: (1) voltages (2) resistances (3) impedances (4) frequencies

5082. The insulated laminations in a transformer act to reduce currents in the: (1) primary winding (2) secondary winding (3) iron transformer core (4) wiring around the transformer

5083. Power transformers operate by the principle of: (1) mutual inductance (2) magnetic attraction (3) piezoelectric effect (4) copper losses

5084. A tuned circuit is formed from two basic components. These are: (1) diodes and transistors (2) resistors and transistors (3) directors and reflectors (4) inductors and capacitors

5085. When a parallel coil-capacitor combination is supplied with AC of different frequencies, there will be one frequency where the impedance is highest. This is the: (1) reactive frequency (2) impedance frequency (3) inductive frequency (4) resonant frequency

5086. In a parallel-resonant circuit at resonance, the circuit has a: (1) low impedance (2) high impedance (3) low mutual inductance (4) high mutual inductance

5087. In a series resonant circuit at resonance, the circuit has a: (1) low impedance (2) high impedance (3) low mutual inductance (4) high mutual inductance

5088. A coil and an air-spaced capacitor are arranged to form a resonant circuit. The resonant frequency will remain the same if we: (1) wind more turns on the coil (2) increase the area of plates in capacitor (3) replace the air dielectric with oil in the capacitor (4) add a resistor to the circuit

5089. Resonant circuits are frequently used in receivers since they form a circuit which changes impedance with changes in applied: (1) current direction (2) voltage level (3) signal frequency (4) power

5090. Piezoelectric effects are used in: (1) magnetic earphones (2) crystal microphones (3) series resistance circuits (4) parallel resistance circuits

5091. Piezoelectricity is generated by: (1) touching crystals with magnets (2) moving a magnet near a crystal (3) adding impurities to a crystal (4) deforming certain crystals

5092. The operation of crystal microphones depends on the: (1) mutual induction effect (2) piezoelectric effect (3) parallel resonance effect (4) semiconductor effect

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Feedback, Comments To: J.P. Sweeney

VIf) THEORY OF EQUIPMENT

6001. A meter has a full-scale deflection of 40 microamps and an internal resistance of 96 ohms. You want it to read 0 to 1 mA. The value of the shunt to be used is: (1) 16 ohms (2) 40 ohms (3) 4 ohms (4) 24 ohms

6002. AC voltmeter scales are usually calibrated to read: (1) instantaneous voltage (2) average voltage (3) rms voltage (4) peak voltage

6003. In measuring volts and amperes, the connections should be made with: (1) both voltmeter and ammeter in parallel (2) the voltmeter in parallel and ammeter in series (3) the voltmeter in series and ammeter in parallel (4) both voltmeter and ammeter in series

6004. The sensitivity of a voltmeter is an expression of the: (1) resistance of the meter (2) amount of current causing full-scale deflection (3) loading effect the meter will have on a circuit (4) value of the shunt resistor

6005. The FET VOM is often superior to a multimeter for voltage readings because of its: (1) variable impedance in the input circuit (2) large amount of current to cause a full-scale deflection (3) low-output impedance (4) high-input impedance

6006. When measuring the total resistance of a circuit with an ohmmeter: (1) a reading of zero would indicate an open circuit (2) a very high reading would indicate an open circuit (3) no deflection of the meter needle would indicate an open circuit (4) no deflection of the meter needle would indicate a short-circuit

6007. A moving-coil milliammeter having a full-scale deflection of 1 mA and an internal resistance of 0.5 ohms is to be converted to a voltmeter of 20 volts full-scale deflection. It would be necessary to insert a: (1) series resistance of 19,999.5 ohms (2) shunt resistance of 19.5 ohms (3) series resistance of 1,999.5 ohms (4) shunt resistance of 19,999.5 ohms

6008. What is the first adjustment made on a multimeter when an unknown value of voltage is to be measured? (1) switch the meter to read ohms and the highest scale (2) switch the meter to read amps and the lowest scale (3) switch the meter to read volts and the highest scale (4) switch the meter to read volts and the lowest scale

6009. A voltmeter having a range of 150 volts and an internal resistance of 150,000 ohms is to be extended to read 750 volts. The required multiplier resistor would have a value of: (1) 750,000 ohms (2)

1,500 ohms (3) 600,000 ohms (4) 1,200,000 ohms


6010. A multiplier resistor is associated with: (1) a voltmeter (2) a thermocouple meter (3) an ohmmeter (4) an ammeter


6011. An ideal voltmeter would have: (1) a very low resistance (2) an infinitely large resistance (3) a 0 to 1 mA movement (4) a square-law scale


6012. The sensitivity of an ammeter is: (1) an expression of the resistance of the meter (2) an expression of the amount of current causing full-scale deflection (3) an expression of the loading effect the meter will have on a circuit (4) an expression of the value of the shut resistor


6013. A device providing a signal source for testing the linearity of a single-sideband transmitter is a: (1) wide-range audio oscillator (2) two-tone audio generator (3) RF signal generator (4) spectrum analyser


6014. Transistorized and vacuum-tube voltmeters normally have provisions for measuring three of the following (choose the INCORRECT answer): (1) frequency (2) current (3) resistance (4) voltage


6015. A RF wattmeter is in reality a specialized: (1) voltmeter (2) ammeter (3) ohmmeter (4) frequency meter


6016. A dip meter supplies the radio frequency energy which enables you to check the: (1) adjustment of an inductor (2) calibration of an absorption-type wavemeter (3) impedance mismatch in a circuit (4) the resonant frequency of a circuit


6017. Which of the following instruments could be used to measure the output of a transmitter? (1) a frequency counter (2) a separate power supply (3) a Wheatstone bridge (4) a dummy load and an RF voltmeter


6018. An oscilloscope can be used to display the input and output of a circuit at the same time by: (1) measuring the input on the X axis and the output on the Y axis (2) measuring the input on the Y axis and the output on the X axis (3) measuring the input on the X axis and the output on the Z axis (4) utilizing a dual trace oscilloscope


6019. The clock in a frequency counter normally uses a: (1) crystal oscillator (2) self-oscillating Hartley oscillator (3) mechanical tuning fork (4) free-running multivibrator

6020. To determine the width of an FM signal, normally you would use: (1) a two-tone oscillator (2) an oscilloscope (3) a gated noise source (4) a deviation meter

6021. The output of a secondary RF frequency standard is applied to a receiver at the: (1) output of the audio amplifier (2) input to the RF amplifier (3) output to the second IF (4) output of the first

6022. To do a proper alignment on a receiver, you would require a minimum of: (1) a signal generator and a vacuum-tube voltmeter or equivalent (2) another receiver and a vacuum-tube voltmeter or equivalent (3) an oscillator and dummy load (4) a marker generator and another receiver

6023. You have a very loud low-frequency hum appearing on your CW transmission. In what part of the transmitter would you first look for the trouble? (1) the variable-frequency oscillator (2) the power supply (3) the driver circuit (4) the power amplifier circuit

6024. Voltmeter sensitivity is usually expressed in ohms per volt. This means that a voltmeter with a sensitivity of 20 kilohms per volt would be a: (1) 50-microampere meter (2) 1-milliampere meter (3) 50-milliampere meter (4) 100-milliampere meter

6025. An AC voltmeter is calibrated to read the: (1) effective value (2) peak value (3) average value (4) peak-to-peak value

6026. The frequency accuracy of a frequency counter is determined by: (1) the number of digits displayed (2) the characteristics of the internal time-base generator (3) type of display used in the counter (4) the size of the frequency counter

6027. The sensitivity of a voltmeter whose resistance is 150,000 ohms on the 150-volt range is: (1) 10,000 ohms per volt (2) 150 ohms per volt (3) 100,000 ohms per volt (4) 1,000 ohms per volt

6028. The “zero beat”, in reference to frequency-measuring equipment, means that the: (1) frequency being measured is at the low end of the frequency-measuring equipment (2) condition exists where two frequencies are not in agreement (3) condition exists where two frequencies are the same (4) the frequency-measuring equipment is inoperative

6029. The resistor in series with a meter movement is required to: (1) limit the voltage drop across the meter (2) extend a voltmeter’s range (3) help decrease circuit loading (4) calibrate the meter movement

6030. A meter shunt is used to: (1) decrease circuit loading (2) reduce the resistance of the meter (3) extend the range of the ammeter (4) compensate for battery voltage drop

6031. The range of a DC ammeter can easily be extended by: (1) changing the internal inductance of the meter (2) changing the internal capacitance of the meter to resonance (3) connecting an external resistance in parallel with the internal resistance (4) connecting an external resistance in series with the internal resistance

6032. The sensitivity of an instrument is usually expressed in terms of: (1) resistance (2) power (3) current required for full-scale deflection of the pointer (4) voltage required for full-scale deflection of the pointer

6033. Voltmeter sensitivity is usually expressed as: (1) ohms per volt (2) decibels per ohm (3) amperes per meter (4) milliamps per volt

6034. A dip meter may not be used to: (1) align receiver-tuned circuits (2) align transmitter-tuned circuits (3) determine the frequency of oscillations (4) measure the value of capacitance or inductance

6035. A crystal calibrator is a: (1) stable, free-running oscillator (2) a spectrally pure oscillator (3) stable oscillator rich in harmonics (4) oscillator used to adjust the time-base of an oscilloscope

6036. An oscilloscope cannot be used to: (1) measure frequency (2) determine the amplitude of complex voltage wave forms (3) measure DC voltage (4) determine FM carrier deviation

6037. The deviation meter works on the principle of: (1) a carrier nul and multiplying the modulation frequency by the modulation index (2) a carrier peak and dividing by the modulation index (3) the amplitude of power in the sidebands (4) detecting the frequencies in the sidebands

6038. When using a deviation meter, it is important to know the: (1) modulating frequency (2) modulation index (3) modulating frequency and the modulation index (4) pass-band of the IF filter

6039. A good RF signal generator would not have a: (1) spectrally pure signal (2) single layer of shielding (3) calibrated output attenuator (4) means of modulation

6040. The output attenuator of a signal generator: (1) is accurate when properly terminated (2) always indicates the true output of the generator (3) is twice the indicated value when properly terminated

(4) is one-half the indicated value when properly terminated

6041. A two-tone generator is used to test the: (1) output linearity of a single-sideband transmitter (2) distortion of an audio amplifier (3) frequency response of an oscilloscope (4) bandwidth of a receiver

6042. The peak power output of a single-sideband transmitter, when being tested by a two-tone generator is: (1) one-quarter of the RF peak output power of any of the tones (2) twice the RF power output of any of the tones (3) one-half of the RF peak output power of any of the tones (4) equal to the RF peak output power of any of the tones

6043. The formula to be used to calculate the power output of a transmitter into a resistor load using a voltmeter is: (1) P = IR (2) P=E2/R (3) P = EI/R (4) P = EI cos 0

6044. The bandwidth of an oscilloscope is: (1) the highest frequency signal the scope can display (2) a function of the time-base accuracy (3) indirectly related to screen persistence (4) directly related to gain compression

6045. When using Lissajous figures to determine phase differences, an indication of zero or 180 degrees is represented on the screen of an oscilloscope by: (1) a diagonal straight line (2) a circle (3) an ellipse (4) a horizontal straight line

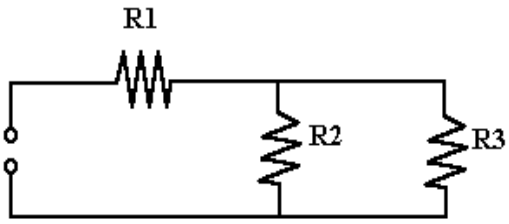
6046. A 100 kHz signal is applied to the horizontal channel of an oscilloscope. A signal of unknown frequency is applied to the vertical channel. The resultant wave form has five loops displayed vertically and 2 loops horizontally. The unknown frequency is: (1) 40 kHz (2) 30 kHz (3) 50 kHz (4) 20 kHz

6047. The standing-wave bridge is usually included as an integral part of an amateur station. It is normally connected: (1) before the low-pass filter (2) after the dummy load (3) after the low-pass filter (4) after the transmatch

6048. In the common base amplifier, Diagram 1, when the input and output signals are compared: (1) the signals are in phase (2) the signals are 180 degrees out of phase (3) the output signal lags the input signal by 90 degrees (4) the output signals leads the input signal by 90 degrees

6049. In the common base amplifier, Diagram 1, the input impedance, when compared to the output impedance, is: (1) very low (2) very high (3) only slightly lower (4) only slightly higher

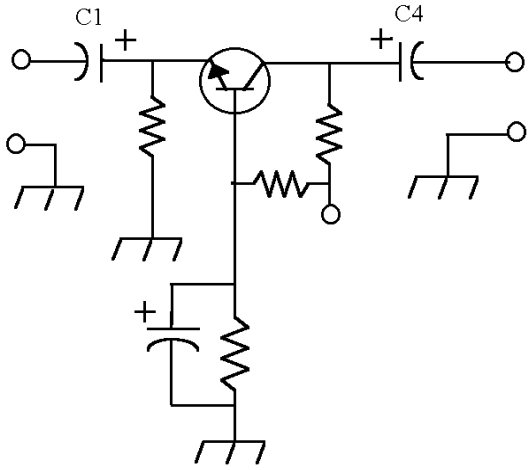
Diagram 1



6050. In the common emitter amplifier, Diagram 2, when the input and output signals are compared: (1) the signals are in phase (2) the signals are 180 degrees out of phase (3) the output signal lags the input signal by 90 degrees (4) the output signal leads the input signal by 90 degrees

6051. In the common emitter amplifier, Diagram 2, the input impedance is several thousand ohms. The output impedance is: (1) less than a thousand ohms (2) equal to the input impedance (3) slightly higher than the input impedance (4) some tens of thousands of ohms

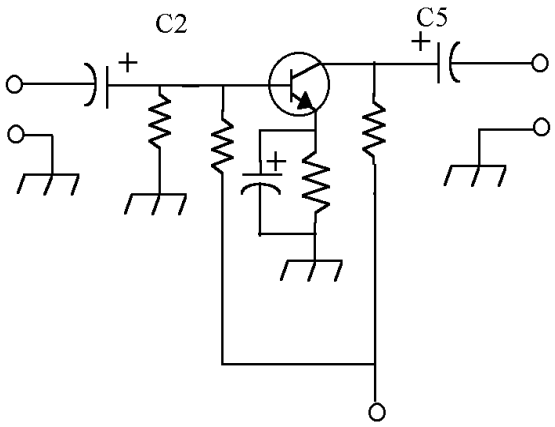
Diagram 2



6052. In the common collector amplifier, Diagram 3, when the input and output signals are compared: (1) the signals are in phase (2) the signals are 180 degrees out of phase (3) the output signal lags the input signal by 90 degrees (4) the output signal leads the input signal by 90 degrees

6053. In the common collector amplifier, Diagram 3, the input impedance, when compared to the output impedance, is: (1) very low (2) very high (3) only slightly lower (4) only slightly higher

Diagram 3

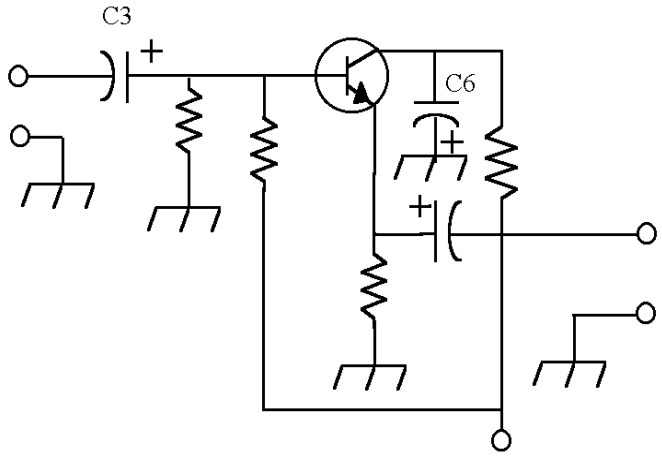


6054. The value of the three (3) electrolytic capacitors (C1 in Diagram 1, C2 in Diagram 2 and C3 in Diagram (3) are approximately: (1) 50 picofarads (2) 500 picofarads (3) 5 microfarads (4) 50 microfarads

6055. In Diagram 4, the schematic circuit represents which of the following oscillators? (1) Colpitts (2) Pierce (3) Hartley (4) Miller

6056. In Diagram 4, the two capacitors in series between the base and ground (Cfa and Cfb) are: (1) electrolytics (2) ceramic (3) silver mica (4) mylar

Diagram 4

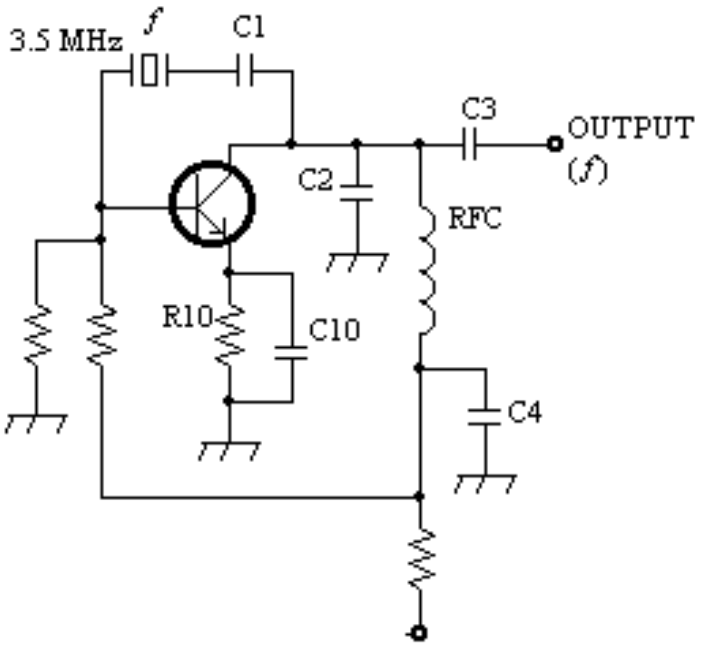


6057. In Diagram 5, the schematic diagram represents which of the following oscillators? (1) Colpitts (2) Pierce (3) Hartley (4) Miller

6058. In Diagram 5, what is the purpose of the capacitor marked C10? (1) blocks RF from previous stage (2) acts as a parasitic suppressor (3) acts as a RF by-pass (4) acts as a frequency-determining

device, in parallel with R10

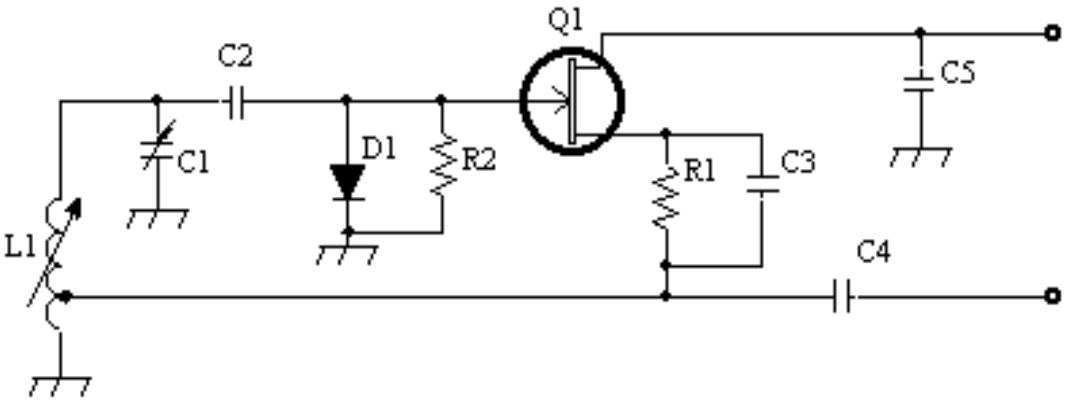
Diagram 5



6059. In Diagram 6, the schematic diagram represents which one of the following? (1) mixer (2) audio amplifier (3) detector (4) variable-frequency oscillator

6060. In Diagram 6, the component D1 in the gate circuit acts as: (1) a frequency-determining device (2) a RF by-pass (3) a half-wave detector (4) a stabilizer for the gate bias

Diagram 6

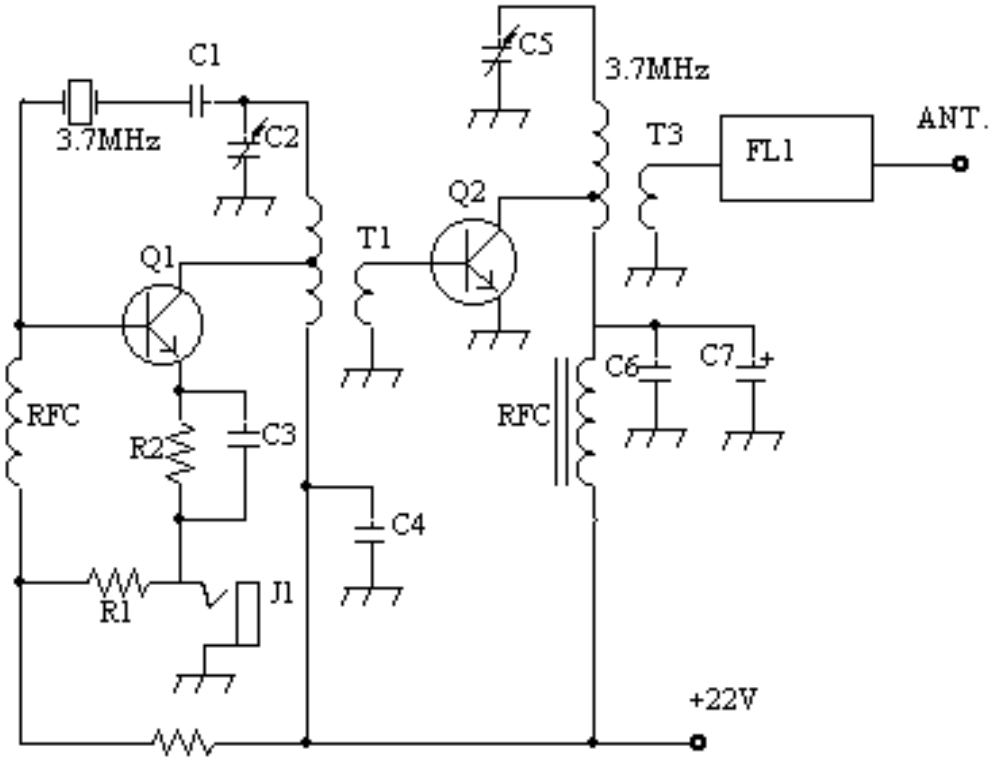


6061. In Diagram 7, the schematic diagram represents which one of the following? (1) a two-stage regenerative receiver (2) a fixed-frequency single-sideband transmitter (3) a two-stage frequency-modulated transmitter (4) a two-stage CW transmitter

6062. In Diagram 7, what is the type of crystal oscillator being used? (1) Pierce (2) Colpitts (3) Hartley (4) Franklin

6063. In Diagram 7, what is the purpose of the box marked FL1 in the antenna lead? (1) blocks DC from reaching the antenna (2) provides protection from high RF fields from other transmitters close by (3) acts as a matching device between the transmitter and antenna (4) acts as a harmonic filter for the transmitter output

Diagram 7

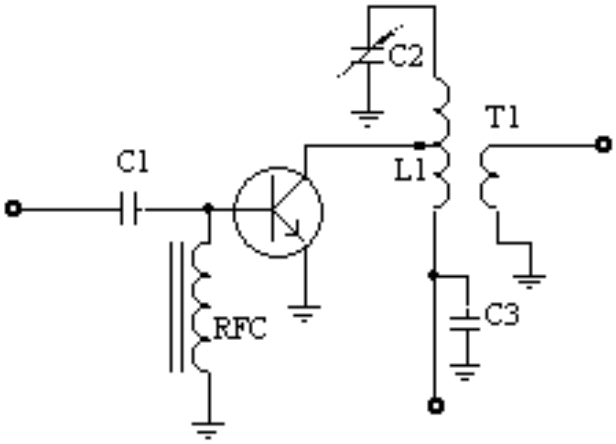


6064. In Diagram 8, the circuit shown represents: (1) a linear amplifier (2) a VHF/UHF amplifier (3) a frequency multiplier (4) a frequency divider

6065. In Diagram 8, the component marked C2 is a: (1) fixed capacitor (2) variable capacitor (3) variable inductor (4) fixed resistor

6066. In Diagram 8, the component marked C3 acts as a: (1) RF by-pass capacitor (2) coupling capacitor (3) tuning capacitor (4) part of the tuned circuit C2, L1

Diagram 8



6067. In Diagram 9, the circuit being represented is: (1) a “Y” match (2) a “T” match (3) an “omega” match (4) a “gamma” match

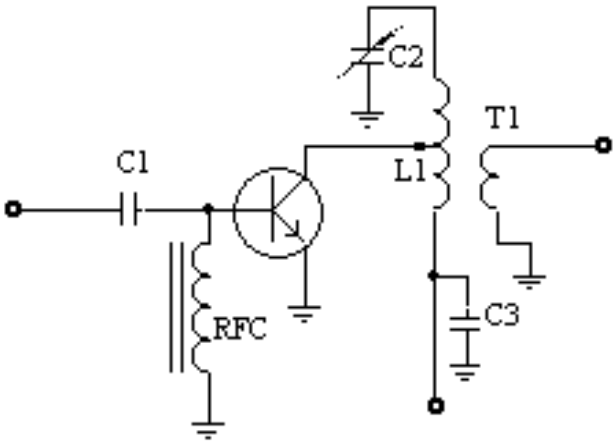
6068. In Diagram 9, the figure “1” represents: (1) the centre of the driven element (2) the coaxial line (3) the adjustable gamma rod (4) the centre of the reflector

6069. In Diagram 9, the figure “2” represents: (1) the coaxial line (2) the centre of the driven element (3) the adjustable gamma rod (4) a variable capacitor

6070. In Diagram 9, the figure “3” represents: (1) the coaxial line (2) the centre of the driven element (3) the adjustable gamma rod (4) the end of the reflector

6071. In Diagram 9, the figure “4” represents: (1) a variable inductance (2) a variable resistance (3) a variable capacitor (4) a variable multivibrator

Diagram 9

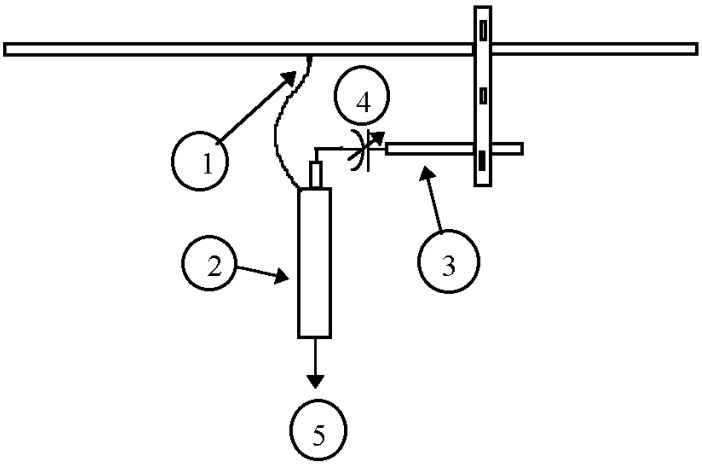


6072. In Diagram 10, in which the horizontal solid line represents a half-wave dipole, the dotted line

represents the distribution of: (1) inductance (2) capacity (3) voltage (4) current

6073. In Diagram 10, in which the solid horizontal line represents a half-wave dipole, the solid curved line represents the distribution of: (1) inductance (2) capacity (3) voltage (4) current

Diagram 10



6074. In Diagrams 11, 12, 13 and 14, all input circuits are low impedance. One of the circuits is used to match into a high-impedance only. Choose the high-impedance output circuit. (1) Diagram 11 (2) Diagram 12 (3) Diagram 13 (4) Diagram 14

6075. In Diagrams 11, 12, 13 and 14, all but one of the circuits have an output that is marked impedance (Z) unknown. Choose the correct three diagrams from the following. (1) Diagrams 11, 12 and 13 (2) Diagrams 11, 13 and 14 (3) Diagrams 11, 12 and 14 (4) Diagrams 12, 13 and 14

Diagram 11 Diagram 12

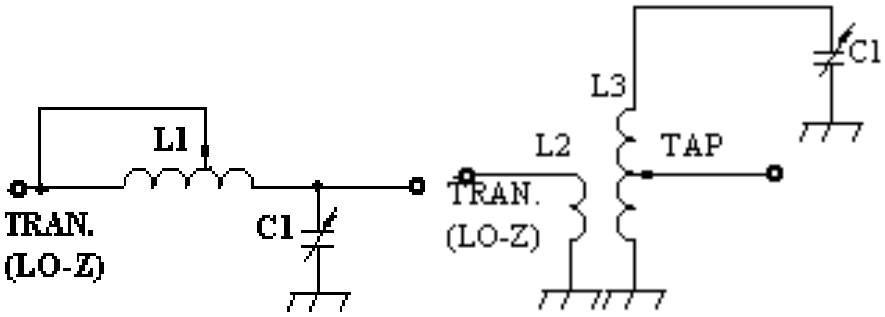
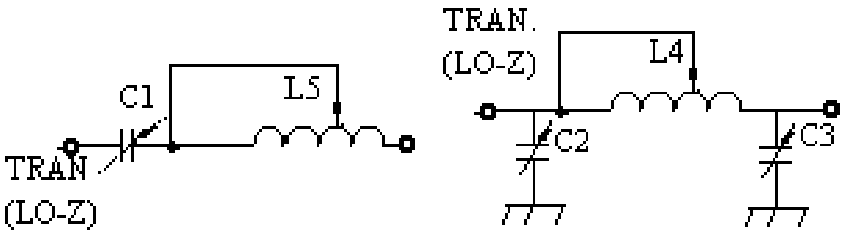


Diagram 13 Diagram 14



6076. In Diagram 15, the schematic diagram represents which one of the following? (1) transmitter (2) power supply (3) receiver (4) antenna matching

6077. In Diagram 15, the component U1 acts as: (1) a tuning network (2) a rectifier (3) matching between the secondary of the power transformer and the filter (4) equalization across the transformer

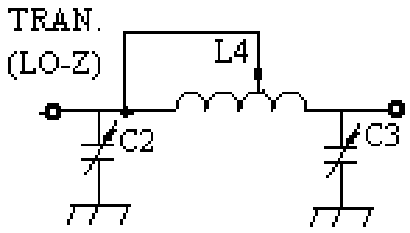
6078. In Diagram 15, the components marked “X” and “Y” are: (1) capacitors (2) chokes (3) diodes (4) fuses

6079. In Diagram 15, the capacitor marked C1 is: (1) ceramic (2) mica (3) air (4) electrolytic

6080. In Diagram 15, the component marked U2 is a: (1) voltage regulator (2) pi filter (3) solid-state by-pass circuit (4) matching circuit for the load

6081. In Diagram 15, the component marked D1 is used to: (1) protect the regulator (2) provide an RF by-pass for the voltage control (3) provide additional capacity (4) protect the diodes in U1 from voltage fluctuations in the primary of the transformer

Diagram 15



6082. In Diagram 16, the schematic diagram shown represents which of the following? (1) a double-conversion superheterodyne receiver capable of receiving CW and SSB (2) a double-conversion superheterodyne receiver used to receive frequency-modulated transmitters (3) a single-conversion receiver with a regenerative detector (4) a triple-conversion superheterodyne receiver capable of receiving AM, FM, SSB and CW

6083. In Diagram 16, what is the function of the components marked C1 and C4 attached to pin 1 of U1? (1) tuning of the antenna (2) tuning of the high-frequency oscillator (HFO) (3) tuning of the beat-frequency oscillator (BFO) (4) tuning both the antenna and the HFO

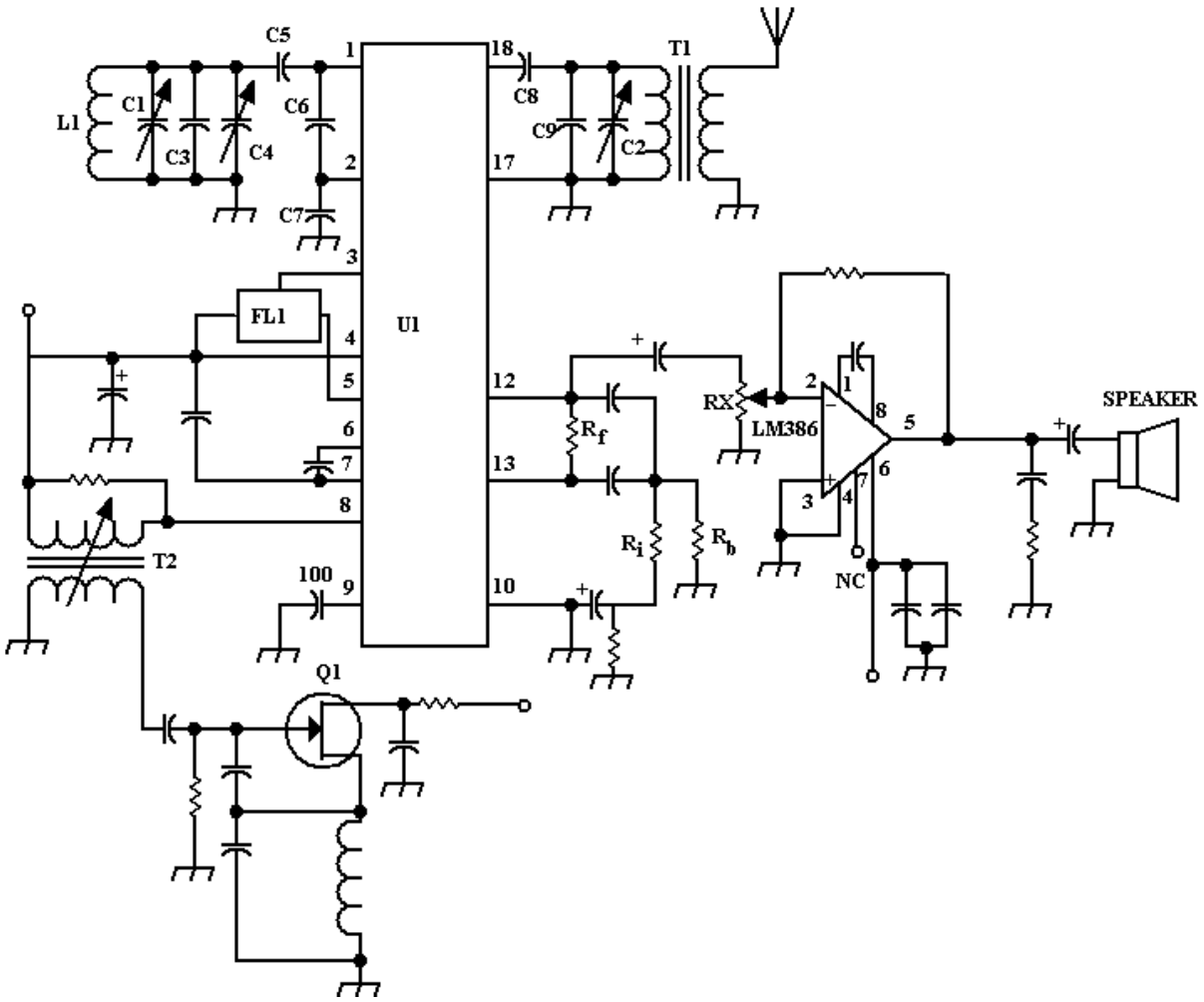
6084. In Diagram 16, what is the function of the component marked C2 placed between pins 17 and 18 of U1? (1) tuning of the antenna (2) tuning of the high-frequency oscillator (HFO) (3) tuning the beat-frequency oscillator (BFO) (4) tuning both the antenna and the HFO

6085. In Diagram 16, what is the purpose of the component marked T2? (1) it provides isolation between the high-frequency oscillator and the detector (2) it provides coupling between the beat-frequency oscillator and the detector (3) it provides tuning for the output of the intermediate frequency amplifier (4) it provides isolation between the voltage on U1 and the drain on Q1 via the ground circuit

6086. In Diagram 16, what is the purpose of the component marked RX coupled to pin 13 of U1 and pin 2 of U2? (1) it is a radio-frequency gain control (2) it is an audio-frequency gain control (3) it is an intermediate frequency gain control (4) it provides variable tuning for the output of the audio filter

6087. In Diagram 16, there are several electrolytic capacitors shown. In all cases they have the same breakdown voltage indicated. That voltage is: (1) 12 volts (2) 16 volts (3) 25 volts (4) 50 volts

Diagram 16



6088. In Diagram 17, the input signal is feeding which of the following elements in the amplifier? (1) the control grid (2) the plate (3) the cathode (4) the filaments

6089. In Diagram 17, what type of network do the components C6, C7, L2 and L3 comprise in the anode circuit of the amplifier? (1) alpha (2) delta (3) gamma (4) pi

6090. In Diagram 17, the component C5 acts as a: (1) by-pass capacitor (2) blocking capacitor (3) tuning capacitor (4) part of a time constant in conjunction with RFC2

6091. In Diagram 17, the location marked 1 on the schematic represents a connection to the: (1) B+ (high voltage) (2) B- (bias) (3) filament voltage (4) ground

6092. In Diagram 17, the location marked 2 on the schematic represents a connection to the: (1) B+ (high voltage) (2) B- (bias) (3) filament voltage (4) ground

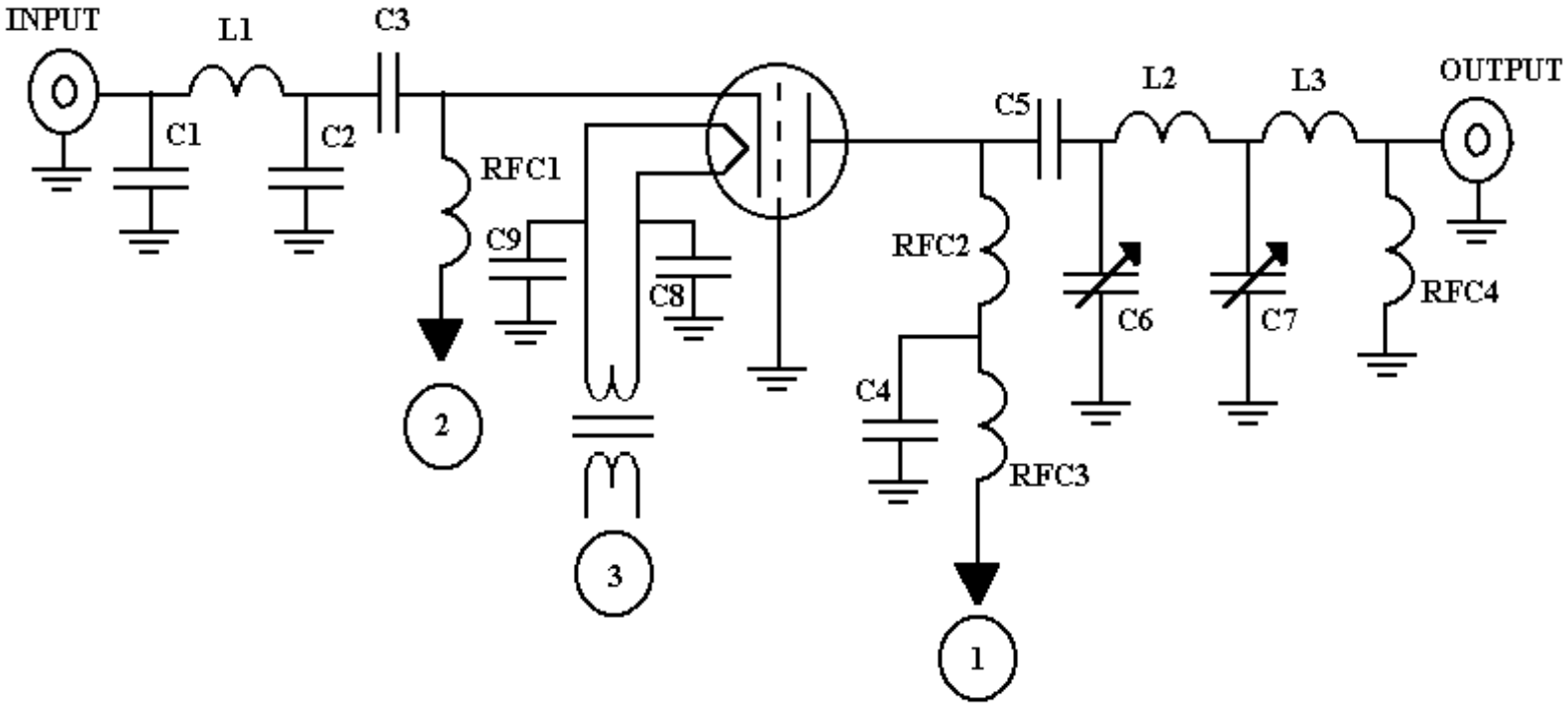
6093. In Diagram 17, the location marked 3 on the schematic represents a connection to the: (1) B+

(high voltage) (2) B- (bias) (3) filament transformer primary connection (4) previous stage

6094. In Diagram 17, although no power supply is shown, what would be the approximate voltage required for an output of 400 watts at 400 mA with approximately 50 percent efficiency? (1) 500 volts (2) 1,000 volts (3) 2,000 volts (4) 3,000 volts

6095. In Diagram 17, both C4 and C8 act as: (1) by-pass capacitors (2) blocking capacitors (3) tuning capacitors (4) a time constant circuit with RFC1 and RFC2

Diagram 17

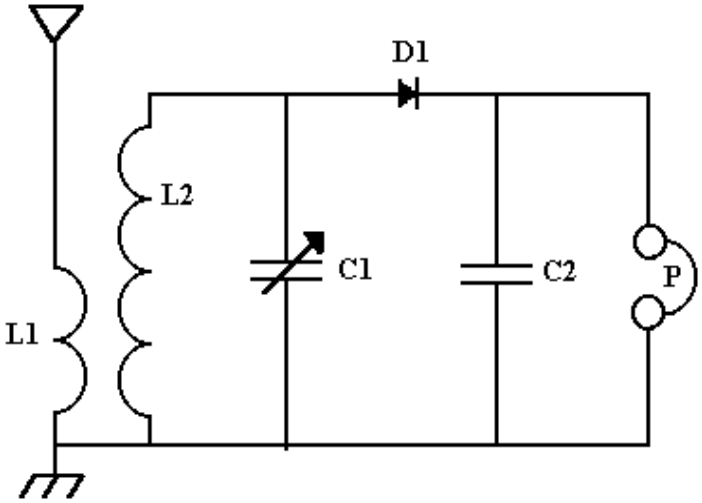


6096. Diagram 18 is a schematic of a: (1) power supply (2) simplified regenerative detector (3) CW transmitter (4) diode detector

6097. In Diagram 18, the component D1 acts as: (1) an oscillator (2) an amplifier (3) a resistor (4) a detector

6098. In Diagram 18, the component marked P is a: (1) phonograph (2) photoelectric cell (3) potentiometer (4) pair of headphones

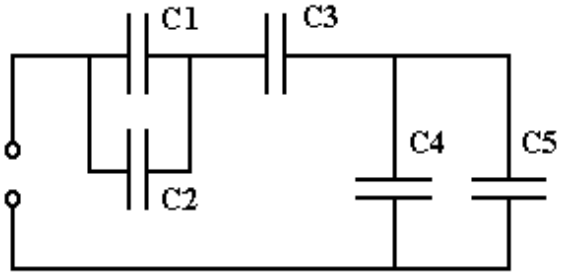
Diagram 18



6099. In Diagram 19, if C1 and C2 are 100 microfarads, C3 is 100 microfarads and C4 and C5 are 100 microfarads, what is the total capacity of the circuit to the nearest whole number? (1) 20 microfarads (2) 50 microfarads (3) 200 microfarads (4) 500 microfarads

6100. In Diagram 19, if C1 is 20 microfarads, C2 is 50 microfarads, C3 is 10 microfarads, C4 is 40 microfarads and C5 is 80 microfarads, what is the total capacity of the circuit to the nearest whole number? (1) 6 microfarads (2) 8 microfarads (3) 10 microfarads (4) 17 microfarads

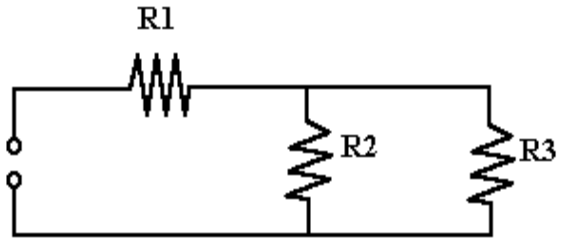
Diagram 19



6101. In Diagram 20, if R1 is 100 kilohms, R2 is 20 kilohms and R3 is 50 kilohms, what is the total resistance of the circuit to the nearest whole number? (1) 84 kilohms (2) 103 kilohms (3) 109 kilohms (4) 114 kilohms

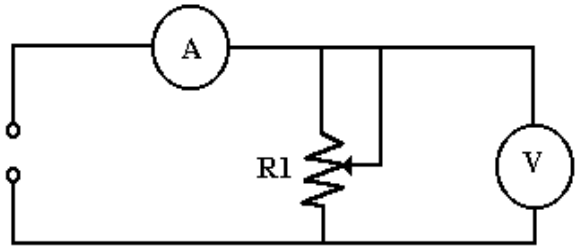
6102. In Diagram 20, if R1 is 20 ohms and R2 and R3 are 100 ohms, what is the total resistance of the circuit to the nearest whole number? (1) 30 ohms (2) 50 ohms (3) 60 ohms (4) 70 ohms

Diagram 20



6103. In Diagram 21, voltmeter V has a sensitivity of 1000 ohms per volt and reads 100 V. R1 is set at 10,000 ohms. What current should be indicated on ammeter A? (1) 0.001 amp (2) 0.011 amp (3) 0.1 amp (4) 1.0 amp

Diagram 21



Good luck on the exam!

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