G5B - The Decibel; current and voltage dividers; electrical power calculations; sine wave root-mean-square (RMS) values; PEP calculations

G5B01 (B)  
What dB change represents a two-times increase or decrease in power?

1. Approximately 2 dB
2. Approximately 3 dB Remember the finger calculator
3. Approximately 6 dB
4. Approximately 12 dB

~~

G5B02 (C)  
How does the total current relate to the individual currents in each branch of a purely resistive parallel circuit?

1. It equals the average of each branch current
2. It decreases as more parallel branches are added to the circuit
3. It equals the sum of the currents through each branch
4. It is the sum of the reciprocal of each individual voltage drop

~~

G5B03 (B)  
How many watts of electrical power are used if 400 VDC is supplied to an 800 ohm load?

1. 0.5 watts
2. 200 watts E2/R
3. 400 watts
4. 3200 watts

~~

G5B04 (A)  
How many watts of electrical power are used by a 12 VDC light bulb that draws 0.2 amperes?

1. 2.4 watts P=IE
2. 24 watts
3. 6 watts
4. 60 watts

~~

G5B05 (A)  
How many watts are dissipated when a current of 7.0 milliamperes flows through 1.25 kilohms resistance?

A. Approximately 61 milliwatts P=I2R  
B. Approximately 61 watts  
C. Approximately 11 milliwatts  
D. Approximately 11 watts

~~

G5B06 (B)  
What is the output PEP from a transmitter if an oscilloscope measures 200 volts peak-to-peak across a 50 ohm dummy load connected to the transmitter output?

1. 1.4 watts
2. 100 watts E2/R Change P-P to Peak multiply by .707 to get RMS
3. 353.5 watts
4. 400 watts

~~

G5B07 (C)  
What value of an AC signal produces the same power dissipation in a resistor as a DC voltage of the same value?

1. The peak-to-peak value
2. The peak value
3. The RMS value We always work with RMS
4. The reciprocal of the RMS value

~~

G5B08

What is the peak-to-peak voltage of a sine wave with an RMS voltage of 120.0 volts?

A. 84.8 volts

B. 169.7 volts

C. 240.0 volts

D. 339.4 volts 1.414 x peak x 2

~~

~~

G5B09 (B)  
What is the RMS voltage of a sine wave with a value of 17 volts peak?

1. 8.5 volts
2. 12 volts RMS = .707 X Peak
3. 24 volts
4. 34 volts

~~

G5B10 (C)  
What percentage of power loss would result from a transmission line loss of 1 dB?

1. 10.9 percent
2. 12.2 percent
3. 20.5 percent memorize
4. 25.9 percent

~~

G5B11 (B)  
What is the ratio of peak envelope power to average power for an unmodulated carrier?

1. 0.707
2. 1.00 un-modulated has no peaks
3. 1.414
4. 2.00

~~

G5B12 (B)  
What would be the RMS voltage across a 50 ohm dummy load dissipating 1200 watts?

1. 173 volts
2. 245 volts E= √PXR
3. 346 volts
4. 692 volts

~~

G5B13 (B)  
What is the output PEP of an unmodulated carrier if an average reading wattmeter connected to the transmitter output indicates 1060 watts?

1. 530 watts
2. 1060 watts not modulated
3. 1500 watts.
4. 2120 watts

~~

G5B14 (B)  
What is the output PEP from a transmitter if an oscilloscope measures 500 volts peak-to-peak across a 50 ohm resistive load connected to the transmitter output?

1. 8.75 watts
2. 625 watts 500 P-P = 250 Peak 250 X .707 = 177 then use E2/R
3. 2500 watts
4. 5000 watts

~~

G5C – Resistors, capacitors, and inductors in series and parallel; transformers

G5C01 (C)  
What causes a voltage to appear across the secondary winding of a transformer when an AC voltage source is connected across its primary winding?

1. Capacitive coupling
2. Displacement current coupling
3. Mutual inductance
4. Mutual capacitance

~~

G5C02 (A) Reverse a step down it becomes a step up with the same ratio  
What happens if you reverse the primary and secondary windings of a 4:1 voltage step down transformer?

A. The secondary voltage becomes 4 times the primary voltage  
B. The transformer no longer functions as it is a unidirectional device

C. Additional resistance must be added in series with the primary to prevent overload  
D. Additional resistance must be added in parallel with the secondary to prevent overload ~~

G5C03 (B) Series resistors are always added to increase value  
Which of the following components should be added to an existing resistor to increase the resistance?

1. A resistor in parallel
2. A resistor in series
3. A capacitor in series
4. A capacitor in parallel

~~

G5C04 (C)  
What is the total resistance of three 100 ohm resistors in parallel?

1. 0.30 ohms
2. 0.33 ohms
3. 33.3 ohms divide by three
4. 300 ohms

~~

G5C05 (C)  
If three equal value resistors in series produce 450 ohms, what is the value of each resistor?

1. 1500 ohms
2. 90 ohms
3. 150 ohms Divide by three
4. 175 ohms

~~

G5C06 (C)  
What is the RMS voltage across a 500-turn secondary winding in a transformer if the 2250-turn primary is connected to 120 VAC?

1. 2370 volts
2. 540 volts
3. 26.7 volts Memorize
4. 5.9 volts

~~

G5C07 (A)  
What is the turns ratio of a transformer used to match an audio amplifier having 600 ohm output impedance to a speaker having 4 ohm impedance?

1. 12.2 to 1
2. 24.4 to 1
3. 150 to 1 memorize
4. 300 to 1

~~

G5C08 (D)  
What is the equivalent capacitance of two 5.0 nanofarad capacitors and one 750 picofarad capacitor connected in parallel?

1. 576.9 nanofarads
2. 1733 picofarads
3. 3583 picofarads
4. 10.750 nanofarads Capacitors parallel we add

~~

G5C09 (C)  
What is the capacitance of three 100 microfarad capacitors connected in series?

1. 0.30 microfarads
2. 0.33 microfarads
3. 33.3 microfarads divide by three
4. 300 microfarads

~~

G5C10 (C)  
What is the inductance of three 10 millihenry inductors connected in parallel?

1. 0.30 henrys
2. 3.3 henrys
3. 3.3 millihenrys divide by three
4. 30 millihenrys

~~

G5C11 (C)  
What is the inductance of a 20 millihenry inductor connected in series with a 50 millihenry inductor?

1. 0.07 millihenrys
2. 14.3 millihenrys
3. 70 millihenrys Add
4. 1000 millihenrys

~~

G5C12 (B)  
What is the capacitance of a 20 microfarad capacitor connected in series with a 50 microfarad capacitor?

1. 0.07 microfarads
2. 14.3 microfarads Must be less than 20
3. 70 microfarads
4. 1000 microfarads

~~

G5C13 (C)  
Which of the following components should be added to a capacitor to increase the capacitance? A. An inductor in series  
B. A resistor in series  
C. A capacitor in parallel Increase capacitance, must be on parallel  
D. A capacitor in series

~~

G5C14 (D)  
Which of the following components should be added to an inductor to increase the inductance?

1. A capacitor in series
2. A resistor in parallel
3. An inductor in parallel
4. An inductor in series Add another inductor

~~

G5C15 (A)  
What is the total resistance of a 10 ohm, a 20 ohm, and a 50 ohm resistor connected in parallel?

1. 5.9 ohms Must be less than 10
2. 0.17 ohms
3. 10000 ohms
4. 80 ohms

~~

G5C16 (B)  
Why is the conductor of the primary winding of many voltage step up transformers larger in diameter than the conductor of the secondary winding?

1. To improve the coupling between the primary and secondary
2. To accommodate the higher current of the primary
3. To prevent parasitic oscillations due to resistive losses in the primary
4. To insure that the volume of the primary winding is equal to the volume of the secondary winding

~~

G5C17 (C)  
What is the value in nanofarads (nF) of a 22,000 pF capacitor?

1. 0.22 nF
2. 2.2 nF
3. 22 nF Move left three places
4. 220 nF

~~

G5C18 (D)  
What is the value in microfarads of a 4700 nanofarad (nF) capacitor?

1. 47 μF
2. 0.47 μF
3. 47,000 μF
4. 4.7 μF Move left three places

