1. When joining a group of amateurs already in radio contact the Licence requires you to

1A5.6441.1
N149590

A. just join in at suitable moment
B. establish communication with any one member of the group
C. establish communication with each member of the group as they speak
D. establish communication with the control station.

2. You are demonstrating your station to a member of your family. At the end the family member asks if they can operate the station. You can

1B1.6454.1
N149590

A. if they operate the equipment, tell them that they can only send a message using Morse code
B. let them operate the radio equipment whilst you watch them
C. allow them to send a message whilst you operate the station
D. let them operate you station whilst you go to the shops.

3. When receiving a message from an overseas amateur on a frequency band not shown in the schedule to your licence, you must

1C2.6479.1
N149590

A. reply on the same frequency and advise the station to QSY to a new frequency
B. only reply using a frequency permitted by your licence
C. not respond to the message
D. reply by using the same frequency and moving the main tuning dial to bring your transmission in band.

4. As a Full Licence holder you MUST ensure that your transmissions DO NOT

1D1.6490.1
N149590

A. drift within the amateur band in use
B. contain any unwanted emissions
C. cause undue interference to other electrical equipment
D. allow more than 1% of the mean power to fall outside the nominal modulated carrier bandwith.

5. You are considering a phone line for remote control of your transmitter. You should also consider

1E2.6507.1

N149590

A. if you need to notify Ofcom of the location of the remotely controlled transmitter

B. whether such use is within the terms of your telephone service provider

C. how to obtain the Notice of Variation to permit the use of a remotely controlled transmitter

D. whether it could be used from the club room as well as your home.

6. When operating maritime mobile, which of the following does NOT apply?

1F2.6533.1

N149590

A. Observe radio silence on the advice of the ships master

B. Cease operation on the demand of the ships master

C. Cease operation when crossing the International Date Line

D. You must obtain written permission from the ships master.

7. What is the purpose of antenna directivity when conducting an electromagnetic field compliance assessment?

1G2.8010.4

N149590

A. It corrects for variations in transmit power depending on the feeder SWR

B. It subtracts the power reflected back down the feeder when calculating radiated power

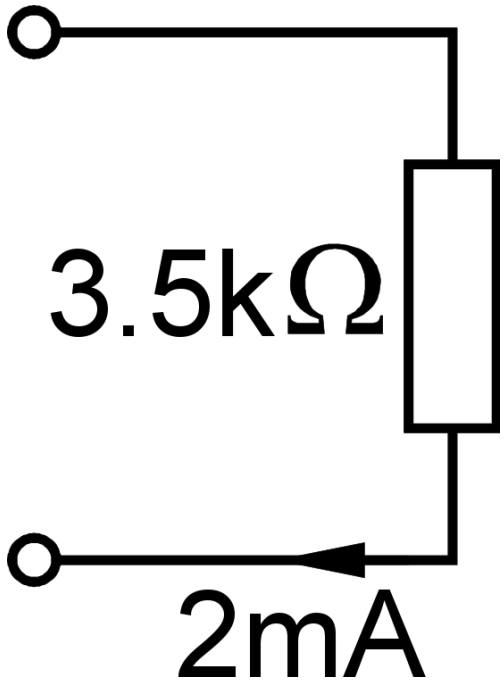
C. It accounts for people being out of the main lobe of elevated directional antennas

D. It allows for inefficiencies and mismatch losses in antenna performance.

8. What power is dissipated in the resistor in the diagram?

2B1.6561.1

N149590



A. 5.5mW
B. 1.75mW
C. 7mW
D. 14mW.

9. A small electrolytic capacitor is marked 100µF - 25 V. This means that

2D3.6577.1

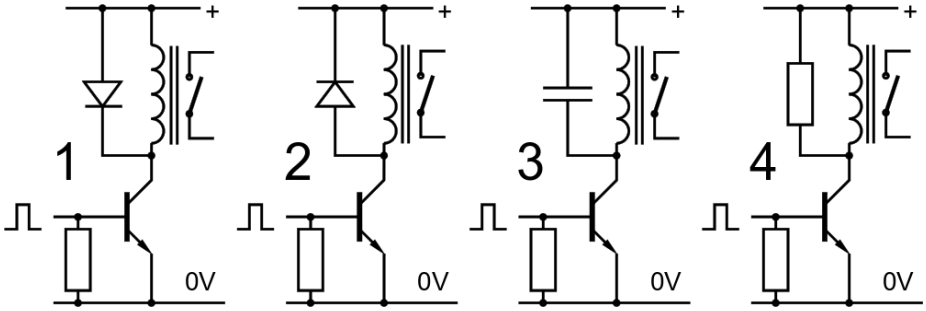
N149590

A. the DC voltage, plus the peak value of any superimposed AC voltage applied, must not exceed 25 V
B. when charged to 25 V it will have a charge of 2,500 coulombs
C. it should not be connected to an AC voltage source of more than 25 V peak
D. the polarity does not matter provided the DC supply is below 25V.

10. The drawing shows the circuit of a switching transistor controlling the current in the coil of a relay. The base is fed with regular pulses to cause the relay contacts to close. Which circuit will minimise the voltage spikes caused by the switching?

2D4.7674.4

N149590

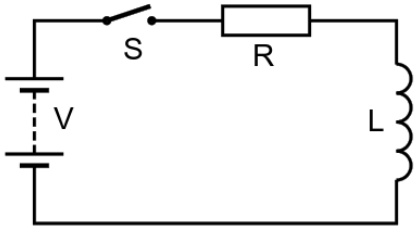


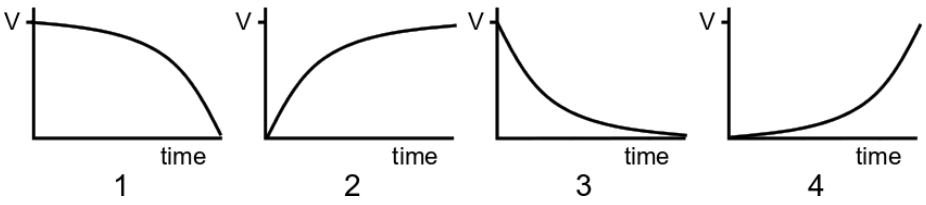
A. Circuit 3
B. Circuit 4
C. Circuit 1
D. Circuit 2.

11. The switch S in the diagram is closed at time t=0. Which graph correctly shows the voltage across the coil after the switch is closed?

2D7.7675.4

N149590



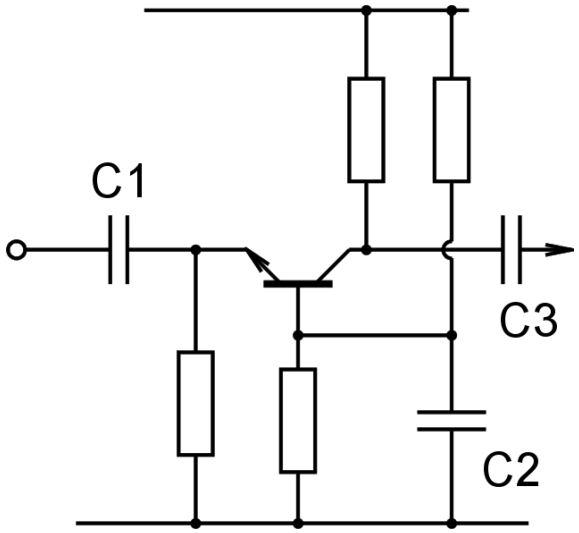


A. Graph 3
B. Graph 4
C. Graph 1
D. Graph 2.

12. In the circuit shown, C2 is used as a

2E4.6603.1

N149590



A. frequency matching capacitor
B. DC blocking capacitor
C. decoupling capacitor
D. coupling capacitor.

13. An analogue to digital converter is sampling at 7000 samples per second. There is a low-level signal present at the ADC input at 3.6kHz. After conversion the signal will be treated as

2F1.6620.1

N149590

A. a signal at 3.4 kHz
B. a signal at 100 Hz
C. a wideband noise signal
D. a signal at 3.6 kHz.

14. A transformer with 25 turns on the primary and 5 turns on the secondary, has a 1kΩ resistor connected to the secondary. The impedance measured at the primary will be

2G1.6630.1

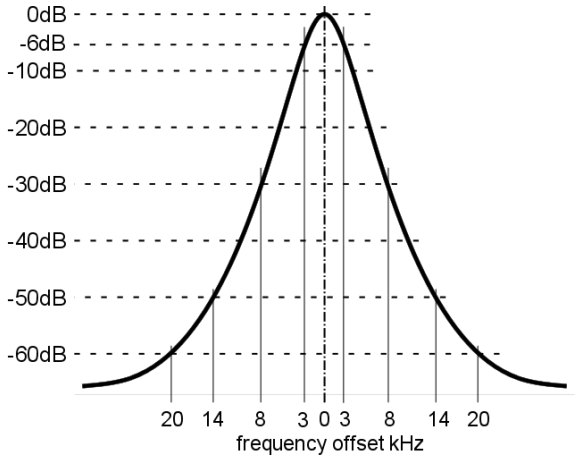
N149590

A. 50kΩ
B. 5kΩ
C. 50Ω
D. 25kΩ.

15. The drawing shows the response curve of a single tuned circuit that might be used in the IF of a receiver. If the centre frequency is 100kHz, the Q-factor is approximately

2H4.6659.1

N149590



A. 6
B. 33
C. 20
D. 17.

16. In a Field Effect Transistor the

2I3.6672.1

N149590

A. gate is normally forward-biased (with respect to the source), and with more forward bias the channel moves into “enhancement mode”
B. width of the depletion layer increases rapidly as the forward current between drain and source increases
C. width of the depletion layer increases rapidly as the forward current between drain and source decreases
D. gate is normally reverse-biased (with respect to the source), and with more reverse bias, the channel becomes “pinched off”.

17. One feature of a transistor amplifier biased in class C is that

2I4.6699.3

N149590

A. the levels of distortion are likely to be lower than other classes
B. a tuned or resonant collector load is normally required
C. two transistors are required, operating in a push-pull configuration
D. the supply current tends to be higher than other classes.

18. The output voltage of a stabilised mains operated power supply is often controlled by a

2J2.6703.1

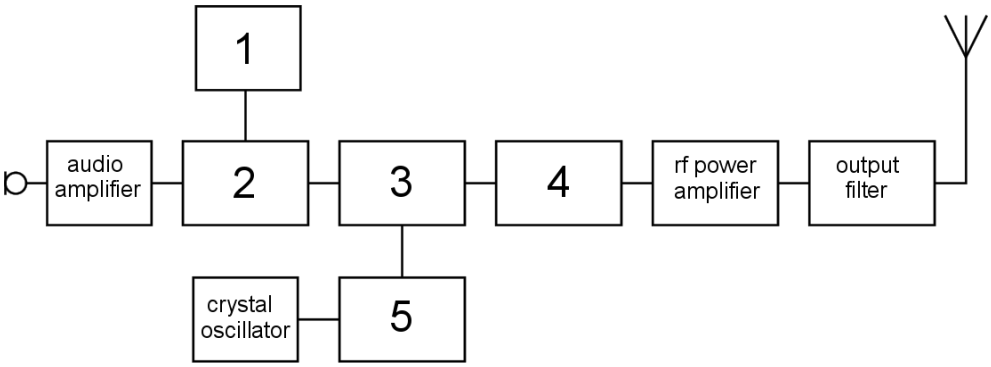
N149590

A. series pass transistor with a Zener reference diode
B. bridge rectifier with series pass transistor
C. bridge rectifier with a reservoir capacitor
D. series pass transistor with a reservoir capacitor.

19. For the block diagram of a transmitter, select the response that matches the function of the numbered component blocks.

3B1.6730.1

N149590



A. 1=Frequency Synthesiser, 2=Mixer, 3=Crystal Oscillator, 4=Filter RF Driver
B. 1=Crystal Oscillator, 3=Mixer, 4=Frequency Synthesiser, 5=Filter RF Driver
C. 1=Crystal Oscillator, 3=Mixer, 4=Filter RF Driver, 5=Frequency Synthesiser
D. 1=Frequency Synthesiser, 2=Filter RF Driver, 3=Mixer, 4=Crystal Oscillator.

20. If there is frequency instability in a transmitter, which of the following methods can minimise this?

3C1.6735.1

N149590

A. Load the PA stage correctly
B. Use a regulated power supply
C. Do not make Morse code dashes too long
D. Speak at a distance from the microphone.

21. What is the purpose of the low pass filter in a direct digital synthesiser?

3C3.8030.2
N149590

A. To ensure the output frequency of the wanted signal remains stable and accurate
B. To remove the effects of minor frequency variations associated with the phase comparator
C. To remove frequencies associated with the step nature of the signal from the DAC
D. To minimise the effect of requesting a fast rate of tuning to a different output frequency.

22. A superhet receiver is tuned to an upper sideband signal on 144.500MHz. The local oscillator is running at 148.500MHz. The sideband filter to admit the signal should be set to

3E2.7776.2
N149590

A. 144.500 to 144.503MHz
B. 4.000 to 4.003MHz
C. 144.493 to 144.500MHz
D. 3.997 to 4.000MHz.

23. A transmitter is normally used on SSB and runs comfortably warm even when peaking at 100W output. It is decided to use the same transmitter on RTTY (radio teletype) and the input level is set so the RF output peaks at the same level as previously used on voice. It is likely that the transmitter will run

3F4.6787.1
N149590

A. a bit cooler than before
B. considerably hotter than before
C. slightly hotter than before
D. at much the same temperature as before.

24. An RF power amplifier (PA) is specified as 200W output and 10dB gain. An input of 25W from the transceiver driving the PA is likely to result in

3G2.6808.1
N149590

A. additional signals close in frequency to those at the input being produced in the PA
B. the transceiver showing an increase in the SWR at its output
C. the PA receiving an overload (ALC) control signal from the transceiver
D. third order harmonics being present in the transceiver output.

25. The ratio between the input signal that can just be heard on a receiver and the signal level at which it overloads is known as the receiver's

3H3.6839.1
N149590

A. noise factor
B. overload margin
C. receive threshold
D. dynamic range.

26. Phase noise is a feature often associated with

3I5.7694.2
N149590

A. an AF amplifier
B. an amplifier operating in class C
C. an oscillator
D. an amplifier operating in class A.

27. If a pre-amplifier with 6dB gain and a sensitivity of 0.15µV for 10dB signal to noise is added to a receiver of identical sensitivity then the sensitivity will be

3J1.6906.1
N149590

A. slightly poorer (less sensitive)
B. increased by 6dB
C. slightly better (more sensitive)
D. unchanged.

28. What settings might be provided to operate the AGC in a receiver?

3L1.7799.2
N149590

A. Attack/decay; fast/slow
B. Forward/reverse; high/low
C. CW/data; on/off
D. Data/voice; high/low.

29. Modulating a carrier with digital data can

3M1.6921.1
N149590

A. vary the amplitude and phase of the carrier
B. only vary the phase of the carrier
C. only vary the amplitude of the carrier
D. only vary the frequency of the carrier.

30. When operating HF SSB in a net of several stations, it is noted that the stations are all transmitting on slightly different frequencies. A good way of improving reception is to adjust the

3N1.6934.1

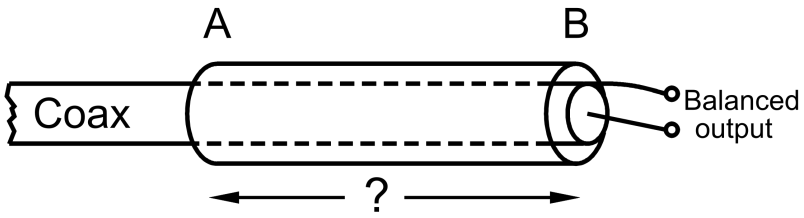
N149590

A. main frequency or tuning control
B. IF filter bandwidth
C. RIT control
D. squelch.

31. The drawing shows a sleeve balun. How long should the sleeve be and at which end should the sleeve be connected to the outer braid of the coaxial feeder?

4B1.7911.4

N149590



A. Connected at end B and a half of a wavelength long
B. Connected at end B and a quarter of a wavelength long
C. Connected at end A and a half of a wavelength long
D. Connected at end A and a quarter of a wavelength long.

32. The length of ONE SIDE of a half-wave dipole for 10MHz mounted clear of local obstructions will be approximately

4D1.6959.4

N149590

A. 7.1m
B. 15.0m
C. 7.50m
D. 6.7m.

33. If RF losses in a feeder are high the SWR measured at the transmitter will be

4E3.6988.1

N149590

A. matched to the feeder
B. the same as the return loss
C. higher than that at the antenna
D. lower than that at the antenna.

34. A 100Ω antenna is feeding a receiver with a 50Ω input impedance. It is decided to improve the matching by inserting a λ/4 length of coaxial cable as an impedance transformer. The characteristic impedance of this cable should be

4F2.7008.1
N149590

A. 100Ω
B. 50Ω
C. 72Ω
D. 300Ω.

35. Communications with amateur satellites should preferably use

5A3.7030.3
N149590

A. orthogonal polarisation
B. circular polarisation
C. transverse polarisation
D. vertical polarisation.

36. A specific feature of NVIS contacts is that the frequency employed is

5B3.7068.1
N149590

A. close to the Critical Frequency
B. always below the Critical Frequency
C. about half the Critical Frequency
D. always above the Critical Frequency.

37. What is the signal level at the receiver if the transmit power is 36dBm and given the link budget parameters below?

5D2.7753.5
N149590

Tx feeder loss 2dB
Tx antenna gain 6dB
Spreading loss 96dB
Obstruction loss 7dB
Rx antenna gain 4dB
Rx feeder loss 1dB

A. -60dBW
B. -60dBm
C. -80dBm
D. -90dBm.

38. To simplify the installation of an alarm system a single wire is run from the control unit through each sensor in series round the house and then back to the control unit. A risk with this approach is that

6A2.8039.2

N149590

A. the loop needs to be balanced to achieve adequate immunity to RF
B. the loop will radiate RF which may interfere with TV reception
C. there is a high likelihood of the wiring picking up RF transmissions
D. it will be slightly harder to determine which sensor has triggered the alarm.

39. Which mode is least likely to cause the form of interference known as cross modulation?

6B2.7089.1

N149590

A. FM
B. CW
C. SSB
D. AM.

40. If an amateur's HF transmission enters a TV system via a masthead pre-amplifier the breakthrough is likely to be caused by

6C2.7103.1

N149590

A. unwanted mixer products in the masthead pre-amplifier
B. harmonics of the amateur transmission
C. cross-modulation in the masthead pre- amplifier
D. unwanted mixer products in the TV receiver.

41. It is noticed that when listening to the amplitude modulated air traffic control transmissions around 134MHz a nearby 2m FM transmission causes the sound to stop. This effect is known as

6C3.7122.1

N149590

A. intermodulation
B. cross-modulation
C. muting
D. blocking.

42. Breakthrough on one particular frequency is best cured by which one of the following?

6D1.7137.1
N149590

A. Balun
B. Notch filter
C. Ferrite bead or beads
D. Low-pass filter.

43. A Mains supply filter that could be fitted to a transmitter power supply generally consists of:

6D2.7166.1
N149590

A. An arrangement of coils wound on ferrite cores and capacitors configured as a 50Hz band stop (notch) filter
B. An arrangement of coils wound on ferrite cores and capacitors configured as a high pass filter
C. An arrangement of coils wound on ferrite cores and capacitors configured as a low pass filter
D. An arrangement of coils wound on laminated iron cores and capacitors to form a 50Hz band pass filter.

44. Why is it recommended that your transmit power is reduced to no more that that required to maintain the contact?

6E1.7180.1
N149590

A. It is a mandatory condition of the Full Licence
B. It reduces the probability of causing interference to nearby electronic devices
C. It allows the transmitter to run a higher duty cycle without overheating
D. More amateur contacts can be achieved without mutual interference.

45. Why is it difficult to achieve a good RF ground when the transmitter is in an upstairs room of a house or building?

6E2.7940.2
N149590

A. The earth rods should be sited several metres from the building and any mains safety earths which is difficult to achieve
B. The distance to the actual ground is a substantial portion of a wavelength so impedance transformation effects need to be considered
C. The vertical RF earth is likely to radiate which will adversely affect the wanted radiation pattern as well as risk EMC problems
D. The inductance of a few metres of wire or braid results in a high reactance, typically over 1kΩ which limits the effectiveness.

46. Powering a transmitter in a car, via the cigarette lighter (accessory) socket is

6F2.7200.1
N149590

A. ill advised because the lighter socket is intended for intermittent use only
B. acceptable if the current required will not exceed about 5A
C. a simple and safe solution for temporary installations
D. ill advised because of the risk of RF entering the car electronics.

47. A neighbour complains to you that they are suffering from interference on a landline telephone. You should advise the neighbour to contact

6G1.245.6
N149590

A. their telecommunications service provider
B. Ofcom
C. the Radio Society of Great Britain
D. the local authority.

48. Many UK amateurs can be heard contacting a station in a country with which communication is normally possible. However, you cannot hear the distant station. A reason for this may be that

7A1.8052.2
N149590

A. the distant station is transmitting on a slightly different frequency from those calling
B. the VFO of the distant station is unstable
C. trans-equatorial paths are not normally bi-directional
D. the station concerned is slightly further away than the skip distance.

49. Taking a copy of your UK Full licence with you when in other countries may be mandatory and you should also note that

7B2.7949.2
N149590

A. a local amateur must supervise your operation
B. operation in CEPT countries requires a Notice of Variation
C. the UK licence frequency schedule applies
D. the band plan in that country may be different.

50. Valve equipment presents a higher risk to safety than solid state equipment mainly because

8A1.7227.1
N149590

A. higher electrical potentials are likely to be present
B. more radio frequency energy is produced
C. valves emit non-ionising radiation
D. there may be broken glass inside the equipment.

51. The static charge from thunderclouds can ionise the air to

8E1.7259.1
N149590

A. allow exceptionally good VHF propagation for several hours
B. allow exceptionally good HF propagation for several hours
C. form a low resistance path to ground enabling a very high current to flow as a lightning strike
D. form a high resistance path to ground allowing the static charge to safely bleed away.

52. In the absence of more explicit instructions by the manufacturer, power for a transceiver properly mounted in the dashboard should be obtained from a

8F5.7272.1
N149590

A. positive wire of adequate capacity direct to the vehicle battery via a correctly rated fuse and a negative wire also direct to the battery via a correctly rated fuse
B. positive wire of adequate capacity to a connection under the dashboard live only when the ignition is ‘on’ and a negative wire to a suitable nearby negative connection
C. positive wire of adequate capacity direct to the vehicle battery via a correctly rated fuse and a negative wire also direct to the battery with no fuse
D. positive wire of adequate capacity direct to the vehicle battery via a correctly rated fuse and a negative wire to a chassis mounting point ideally close to the point at which the battery negative connects to the vehicle chassis.

53. A risk assessment should be carried out

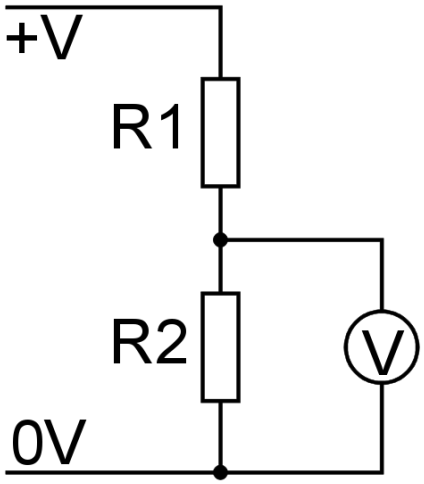
8F6.7956.2
N149590

A. in response to a third party claim following an incident
B. as part of the normal planning for any event
C. when requested by an appropriate authority
D. immediately after an accident when all the details are fresh.

54. The circuit shown is connected to a supply of 24V. R1 is 20kΩ and R2 is 10kΩ. The voltmeter reads 0-15V and has a resistance of 10kΩ. approximately what voltage will it read?

9A1.7284.1

N149590



A. 8V
B. 12V
C. 15V
D. 5V.

55. An oscilloscope is being used with a half-wave dipole antenna to monitor a received signal. The trace shows 282mV peak-to-peak. However when you also connect this assembly to your radio receiver it shows 6dB lower. Why?

9A4.7997.2

N149590

A. Your previous observation was of the peak voltage, not the peak-to-peak voltage
B. In disconnecting the oscilloscope you also inadvertently disconnected the audio to the transmitter
C. The receiver has a 50Ω input impedance for correct matching to 50Ω systems
D. Your previous observation did not allow for peak-to-peak to RMS conversion.

56. A device that measures forward and reflected power on a transmission line is a description of

9A7.7324.1

N149590

A. a heterodyne wavemeter
B. a signal strength meter
C. an absorption wavemeter
D. an SWR meter.

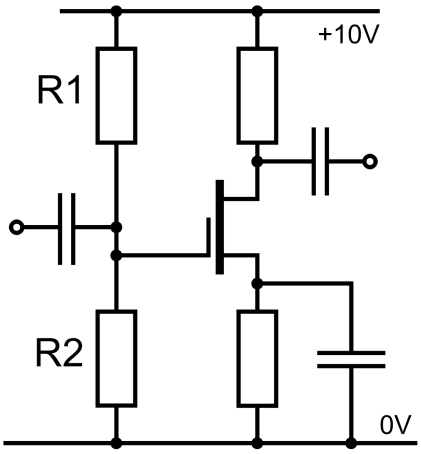
57. The decibel maybe used to measure

9B1.7355.1
N149590

A. power ratios, where multiplying the power by 10 represents an increase of 10 decibels
B. voice quality at a microphone, on a scale which allows the equipment to be used without suffering distortion
C. differences between various types of amplifier, with 0 decibels as the least efficient, and 100 decibels as the most efficient
D. voltage ratios, where multiplying the PD by 10 represents an increase of 10 decibels.

58. The drawing shows an FET circuit biased by R1 and R2. R1 is 80kΩ and R2 is 20kΩ. Both resistors are 10% tolerance. The bias voltage might be lower than its design value by a maximum of

2A1.7884.4
N149590



A. 180mV
B. 100mV
C. 300mV
D. 200mV.