



UK Full Licence Mock Exam - 3 - Dated 01/01/2021

Compiled by Billy GM6DX

These questions are designed to represent a question style that you may get in the exam AND/OR designed to ensure a specific learning point is covered.

Q1. Which of the following is a UK Full licence operating in a temporary location which does not have a fixed postal address?

- A. 2M1ABC/T
- B. M5TTY/T
- C. GB3RL/P
- D. MD5ABC/P

Q2. Your friend F5ASD visits your shack whilst he is on holiday. You decide to let him use your station

- A. You can allow him to air the call sign of M0ABC/A, using all the controls but must be directly supervised by you.
- B. You can allow him to sign M0ABC/F5ASD but limited to 400w on all bands.
- C. You can allow him to air the call sign of M0ABC, using all the controls but you must directly supervise him.
- D. You cannot allow him to use your call sign and he must use M/F5ASD as per CEPT TR61-01.

Q3. When recording and retransmitting a message containing the originator's call sign the licensee must

- A. Ensure that the retransmission is such that the origin of the message and the origin of the retransmission are clear.
- B. Relay the message on to the station specified as in the use of a relay station.
- C. Always include the call sign of the originator of the message in order to comply with both licence conditions.
- D. Retransmit the message only to the original sender, for the purpose of carrying out a test, which must be recorded in the logs of both amateurs.

Q4. You are transmitting on 14.024MHz using CW (Morse code)

- A. You must have the ability to receive this band, if you are transmitting on this band in order to comply with your licence conditions.
- B. You must have the ability to receive on this band and mode in order to comply with your licence conditions.
- C. You do not need to have the facility to receive on the band or mode, to comply with your licence conditions.
- D. You must only use a transceiver at your station so that you can transmit and receive on the same band and mode, to comply with your licence conditions.

Q5. Which of the following pairs of frequencies should be used for wireless links established for the purpose of Remote Control Operation?

- A. 136KHz and 1.8MHz
- B. 28MHz and 144MHz
- C. 21MHz and 24MHz
- D. 50MHz and 432MHz

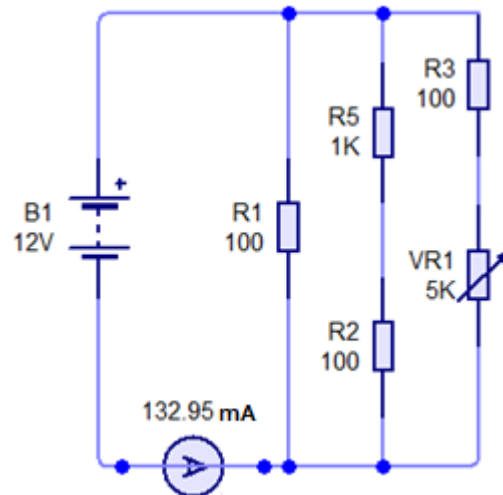
Q6. To permit a UK full license to operate on a vessel in International Waters the ship's master

- A. Must make an entry in the ship's log.
- B. Must make an entry in the amateur licensee's log endorsing same.
- C. Must give written permission to the amateur licensee.
- D. May give oral permission to the amateur licensee.

Q7. Which one of the following bands is NOT authorised under the terms of the Amateur Radio License?

- A. 14.0 - 14.350MHz
- B. 3.5 - 3.8MHz
- C. 24.0 - 24.1MHz
- D. 28.0 - 29.7MHz

Q8.



The total resistance in this circuit will be about?

- A. 100Ω
- B. 90Ω
- C. 6.3kΩ
- D. 1.56Ω

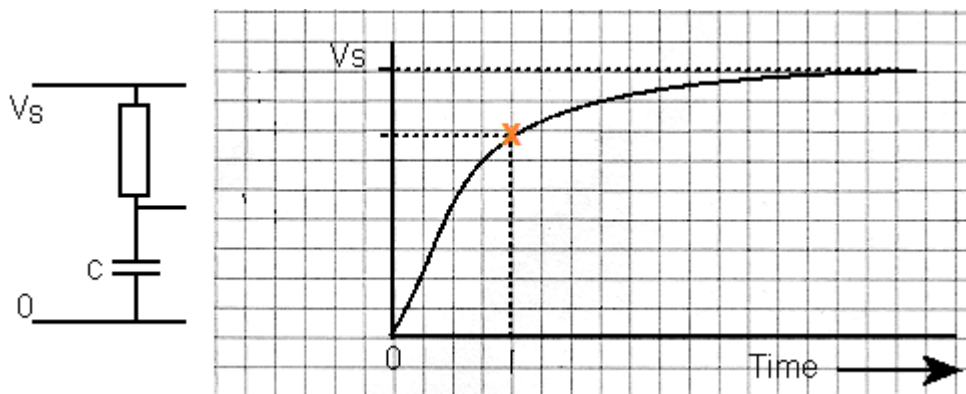
Q9. When selecting the correct low value capacitor for use, as well as the capacitance value you must also consider

- A. Wattage power handling rating.
- B. Polarity.
- C. The break down voltage.
- D. Resistance value.

Q10. A series circuit is made from an inductor, resistor and switch connected to a battery. At the instant the switch is closed there is zero current in the circuit. The reason for this, is that the

- A. Current from the battery takes a short period of time to get around the complete circuit.
- B. Internal resistance of the battery briefly opposes the circuit current.
- C. Electrons in the wire take a short time to get moving in tandem.
- D. Back EMF of the inductor is equal and opposite to the EMF of the battery.

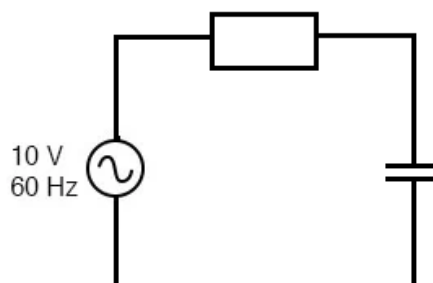
Q11.



How long will it take to charge the 1 μ F capacitor to the point "X", via a resistor which has a value of 3M Ω ?

- A. 1.5S
- B. 3S
- C. 1.5 μ S
- D. 3 μ S

Q12.



This circuit is supplied with 10V at a rate of 60Hz. In the circuit the capacitor has a reactance value of 1500 Ω and a resistor which has a value of 100 Ω , what is the impedance value of this circuit?

- A. 1.6k Ω
- B. 1.401k Ω
- C. 1.503k Ω
- D. 40 Ω

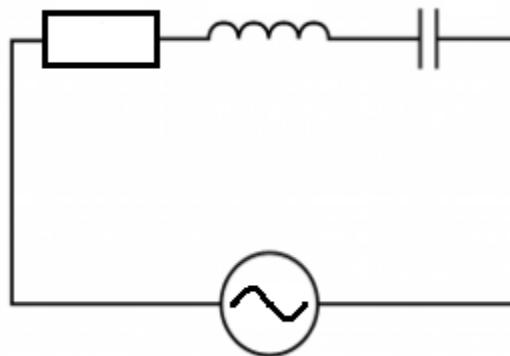
Q13. Which of the following describes taking digital signals in the time domain and calculates the amplitudes and frequencies, which comprised of the original signals?

- A. Aliases.
- B. Nyquist harmonics.
- C. Fourier Transform.
- D. 2nd form of Nyquist rate.

Q14. In a transformer losses turning to heat will NOT affect.

- A. The power that the transformer will take.
- B. The physical size of the transformer being used.
- C. The core material stability.
- D. The quantity of windings required.

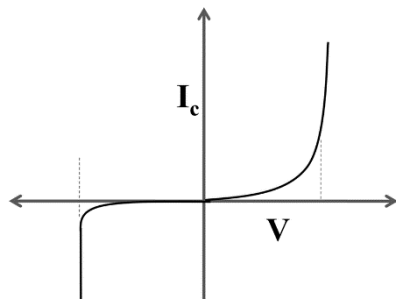
Q15.



What will the Q factor value be of this circuit where $R = 10\Omega$. $L = 50\text{mH}$ and the frequency is 3000Hz ?

- A. 94
- B. 23
- C. 942
- D. 9.4

Q16



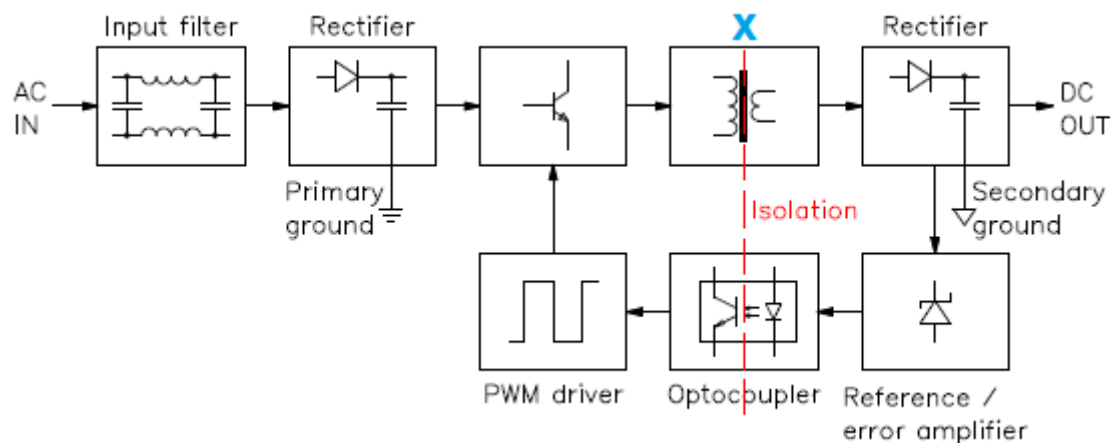
The above shows a response curve of a

- A. FET
- B. Zener diode
- C. Capacitor
- D. Inductor

Q17. The purpose of correctly biasing a transistor's DC voltage is

- A. To allow it to operate as a switch and prevent the use of IC's or toggle switches.
- B. To allow any AC signal to be amplified correctly.
- C. To allow any DC signal to be amplified correctly.
- D. To allow it to rectify the AC signal into DC form.

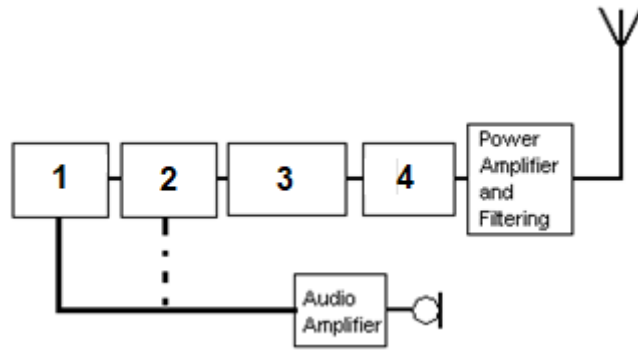
Q18.



What is the function of the box marked "X" in this basic block diagram?

- A. To ensure only - signals of AC are passed.
- B. To step down the voltage.
- C. To act as a switch.
- D. To ensure only + cycles of AC are passed.

Q19.



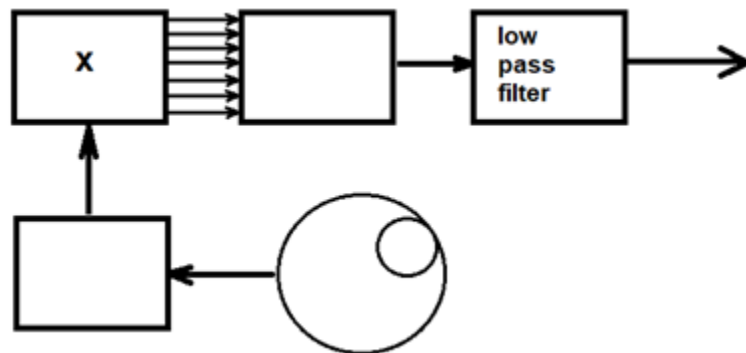
What stage is located at block 2 of this FM transmitter?

- A. Oscillator
- B. Buffer Amplifier
- C. Frequency Multiplier
- D. Filter and Driver

Q20. What would likely be the most serious consequence, in the use of an unstable carrier?

- A. The receiving station would have difficulty receiving the signal of the transmitting station.
- B. The transmission could interfere with nearby television receivers causing TVI.
- C. The transmission could move outside the authorised band.
- D. The transmission could interfere with other nearby amateur stations.

Q21.



The purpose of the box marked with an X is to

- A. Convert digital signals to analogue.
- B. Select the digital signal for use.
- C. Provide a table of various digital signals.
- D. Remove any harmonic signals.

Q22. Which of the following modulation, is often generated by varying the voltage applied to a vari-cap at the RF oscillator stage?

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

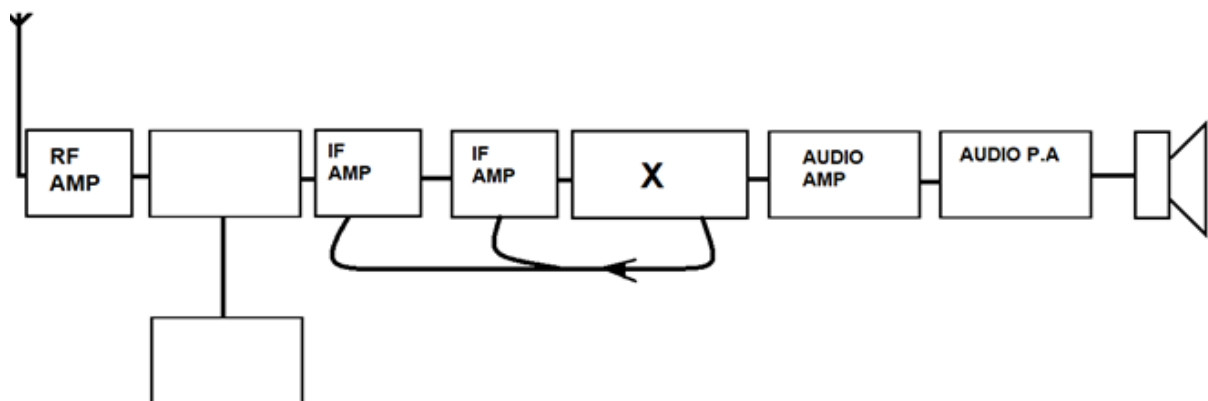
Q23. A single frequency generated in a transmitter is affected by some non-linearity process, leading to distortion, this distortion produces signals known as

- A. Harmonics.
- B. Intermediate Frequencies.
- C. Intermodulation Products.
- D. Side-Bands.

Q24. Where a transmitter uses harmonics to complete the final wanted frequency what is likely to be used to ensure only that signal is passed for amplification?

- A. Low pass filter
- B. High pass filter
- C. Band pass filter
- D. Band stop filter

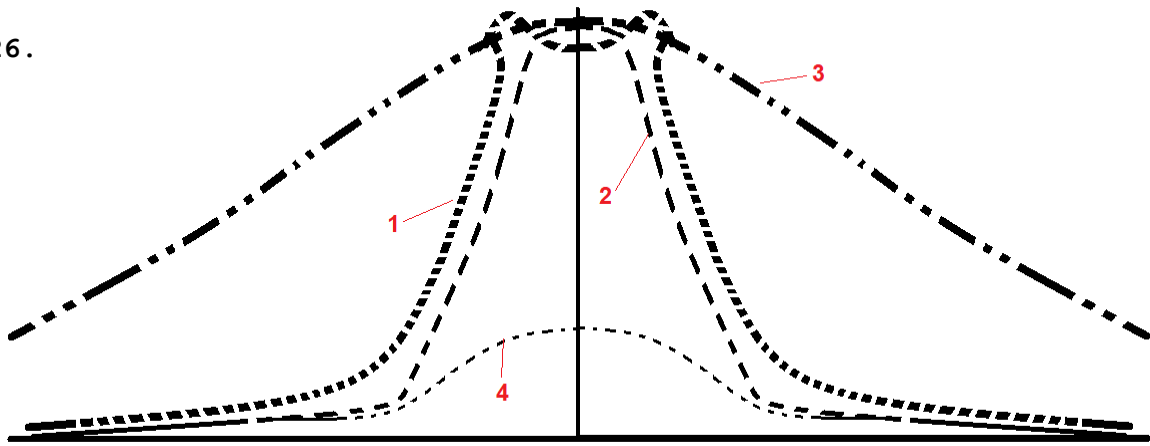
Q25.



The purpose for the box marked with an X is to

- A. Detect what type of modulated signal is present.
- B. Mix the received frequencies with that of the local oscillator.
- C. Convert the audio signal into an audible tone.
- D. Amplify the intermediate signal.

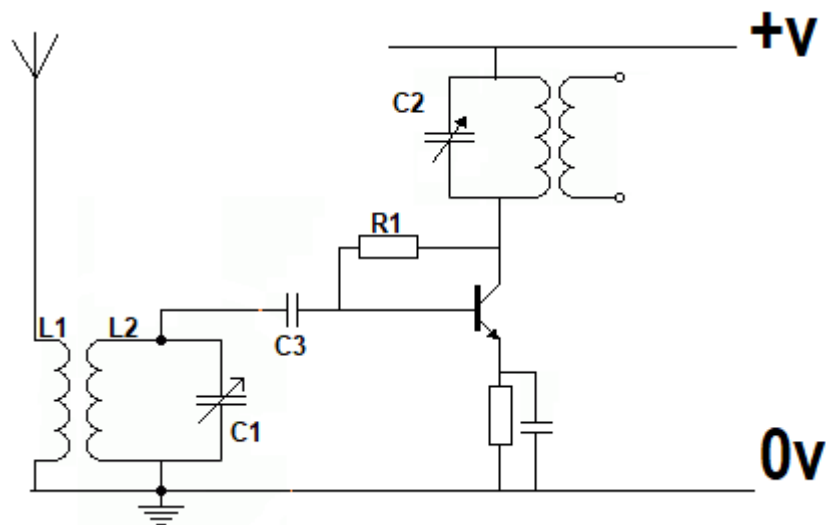
Q26.



Using the image above which dotted frequency response curve is a critically-coupled response curve?

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

Q27.



In the above circuit

- A. Tuning of the RF amplifier is done by varying values of R1 and C2 together.
- B. Tuning of the narrow banded RF amplifier is done by varying C1 & C2.
- C. Only a selected frequency is amplified by varying the value of R1.
- D. Only CW signals will be received and amplified as defined by the value of C2.

Q28. In an Automatic Gain Control circuit the speed of the response can

- A. Be adjusted solely in the attack time stage.
- B. Be adjusted solely in the decay time stage.
- C. Not be adjusted and is fixed.
- D. Be adjusted at both the attack and decay time stages.

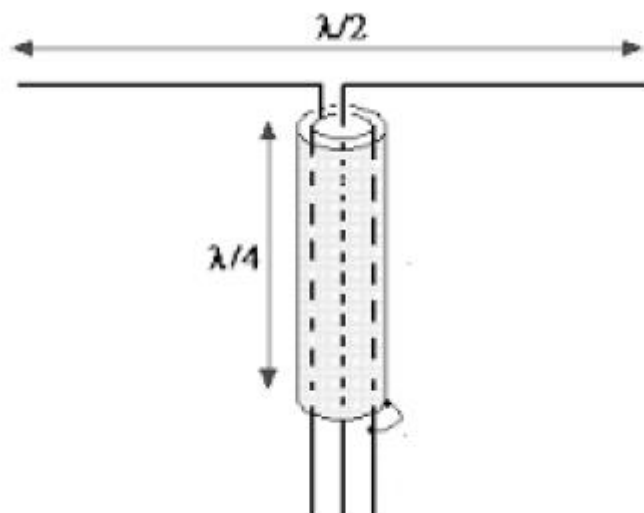
Q29. All forms of modulation can be demodulated by a mathematical equation using a PC or similar device when

- A. Mixing AF with one local oscillator to produce an "I" and "Q" components.
- B. Mixing the RF signal with two local oscillators, 45 degrees out of phase to produce "I" and "Q" components.
- C. Mixing AF with one local oscillator, 45 degrees out of phase to produce an "I" and "Q" components.
- D. Mixing the IF signal with two local oscillators, 90 degrees out of phase to produce "I" and "Q" components.

Q30. The RIT feature on a transceiver is

- A. Known as Receiver Incremental Tuning and is the ability to shift the receive frequency a small amount away from the transmit frequency.
- B. Known as Radio Interface Transmission which is the transmission made by the use of an interface to a PC.
- C. Known as Receiver Instability Tone and senses the received signal and automatically selects the correct CW tone for audible understanding.
- D. Known as the Radio Inverse Transmission, as is the transceivers ability to inverse a sine wave for the purpose of phase shift keying.

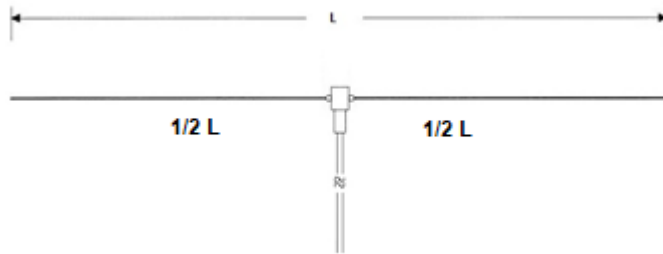
Q31.



The diagram shown is a

- A. Choke balun
- B. 1:1 balun
- C. Sleeve balun
- D. Pawsey stub

Q32.



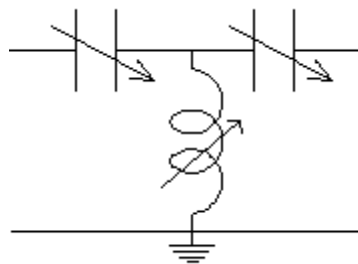
The antenna shown, including the end correction consideration, will have an overall length of what for the 40m band?

- A. 20M
- B. 21M
- C. 40M
- D. 10.5M

Q33. Return loss is

- A. The ratio of forward signal power to the return of signal power usually expressed in dB.
- B. The value of coaxial cable loss usually expressed in dBi.
- C. The value of the receiver's ability to detect weak signals from strong signals.
- D. Is purely a theatrical equation which has not practical value to antenna system construction.

Q34.



The above circuit can be found within a AMU and is commonly known as a

- A. T match
- B. L match
- C. PI match
- D. C match

Q35. Satellite communication often uses circular polarisation because

- A. E and M fields of the satellites signals are in phase with each other.
- B. Orientation of the satellites antennas is not known and can change.
- C. E and H fields of the satellites signals are at 90 degrees to each other.
- D. Orientation of the satellites antennas is known constant.

Q36. When signals are reflected vertically back via the ionosphere this is known as

- A. Critical Frequency Propagation
- B. Near Vertical Incidence Sky wave
- C. Circularised Propagation
- D. EME propagation

Q37. Which of the following bands will be more suitable for Earth Moon Earth propagation?

- A. 145MHz
- B. 29MHz
- C. 14MHz
- D. 7MHz

Q38. Your neighbour has installed his on T.V, down lead and antenna system. You have a look at the install and identify a few issues with the system, which of the following is most likely to affect the immunity?

- A. Fitting an amplifier to the back of the T.V which has a built in high pass filter.
- B. The poor / loose fitting of the connector on the down lead at the amplifier and at the antenna.
- C. The use of shielded 75 ohm coax.
- D. The use of a Yagi rather than dipole antenna.

Q39. When on the 40m band SSB you notice that a neighbours PIR light activates, stays on for 3 minutes and goes off. Thereafter continues in this manner for your duration of transmission.

- A. You must stop transmitting as you are causing undue interference.
- B. You must stop transmitting and purchase a new garden PIR light as it appears faulty.
- C. You can continue to transmit as the PIR light fails to meet the EMC standards and is not immune.
- D. You must stop transmitting as your equipment does not meet the relevant standard and is exceeding the PIR light's immune levels.

Q40. Cross modulation is an effect that occurs when

- A. Both the wanted signal and the local oscillator signal are modulated.
- B. The receiver has inadequate rejection on its image frequency.
- C. Strong RF signals enter the RF stage of a receiver causing non-linearity products.
- D. Different signals are present on the two sidebands of an AM transmission with the same information.

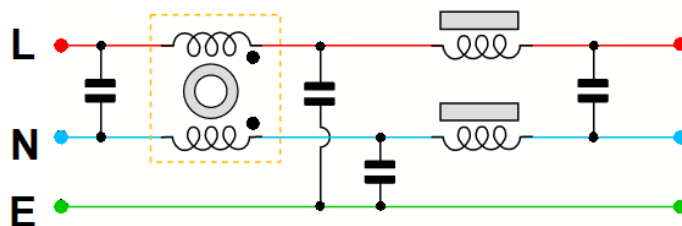
Q41. Your neighbour is planning to install a new television aerial on the extension to his bungalow that he has just built himself. He seeks your advice in selecting a pre-amplifier. How should he reduce the likelihood of suffering cross modulation and overload from your amateur transmissions?

- A. Locate an amplifier that will amplify television and broadcast radio close to the television.
- B. Choose a high gain, wide band amplifier and locate it next to the antenna.
- C. Choose a low gain wide band amplifier and locate it next to the television.
- D. Locate an amplifier that only amplifies the television broadcast signal close to the antenna.

Q42. Which of the following amateur band, 4th harmonic would be in the same frequency range as that of TV Broadcast?

- A. 6M
- B. 12M
- C. 2M
- D. 4M

Q43.



The above circuit

- A. Is that of a transformer and is used to filter out AC negative cycles to produce DC.
- B. Is that of mains RF filter and is used to prevent unwanted RF from entering the mains wiring.
- C. Is a mains filter as found in a 5v USB phone charger.
- D. Is a filter used to prevent unwanted RF in the UK mains from entering your transceiver and negates filtering of the power supply.

Q44. You transmit 50W from your transceiver. The coax to the antenna has 3dB loss. The antenna has a gain of 6dB at a distance of 10m what would the field strength reading be?

- A. 85W/m
- B. 14V/m
- C. 9.8V/m
- D. 7V/m

Q45. Which of the following antenna system is likely to cause fewer EMC problems?

- A. Using a full wave dipole, with balanced feeder leaving the antenna parallel to the antenna elements.
- B. Using a half wave dipole, fed with coaxial cable leaving the antenna at 90 degrees to the element and thereafter buried underground to the shack.
- C. Using an end fed antenna with the feed point at the shack, wire running up the face of your house to the end of the garden via support mast.
- D. Using an end fed antenna with an ATU at the base of the antenna feed point. Ensuring the transmission direction passes through your property.

Q46. The code of practice from which organisation provides advice for radio installations within land based vehicles?

- A. The RSGB
- B. Federation of Communication Services UK
- C. Vehicle and Operator Services Agency
- D. OFCOM

Q47. Jim Smith, your neighbour complains that since you put up a different antenna, he is suffering interference to his hard wired telephone. Which of the following would you do?

- A. Tell him that his overhead telephone wires are too close to your aerial system.
- B. Tell him that his phone is not immune and to use wireless phones.
- C. Ask him if he also suffers interference with television reception.
- D. Ask him when he suffered the interference and check your log to see if you were operating at the time.

Q48. Which of the following is a proportionate reason for operating SPLIT mode on a transceiver?

- A. So that the transceiver can share the band pass filter circuitry.
- B. To take into consideration different countries frequency allocation.
- C. To hold as much of the band allocation as possible to prevent nearby stations using adjacent frequencies
- D. To allow the operation of 2 antennas.

Q49. To obtain a Special event call sign you

- A. Can apply using the Ofcom online licence portal
- B. Can apply through the RSGB
- C. Must apply via paper application to Ofcom
- D. Can apply direct to the ITU

Q50. You are working on a switch mode power supply that has developed a fault.

- A. You must ensure that you only use one hand, to prevent a complete circuit using your body, when working on the power supply which is unplugged and not connected to the mains supply.
- B. You must be careful as large capacitors inside the power supply may still contain voltage and the circuit may still be live.
- C. You must ensure that a rubber mat is used for standing on to prevent a shock from the power supply which is not connected to the mains supply.
- D. You must ensure that you replace the fuse with a piece of wire to prevent the power supply tripping when working on it connected to the mains supply.

Q51. Which of the following produces guidance for exposure to Radio Frequency fields?

- A. HE
- B. RSGB
- C. FCSUK
- D. ICNIRP

Q52. Which of the following hazard is unique to operating mobile?

- A. Accidental shorts to earth of electrical wiring.
- B. Long flexible antennas could be affected by winds.
- C. Lack of attention when driving due to multitasking.
- D. The use of the correct safety fuse.

Q53. Which of the following is least important when dealing with the use and storage of electrical generators?

- A. The generator has a safety earth and ground spike when being used in damp conditions.
- B. That the generator can produce the correct ampere and voltage needed to use the equipment under load.
- C. Fuel being stored is in a ventilated area and must be the minimal amount needed.
- D. The generator is stored separate from the fuel and must be labelled when last tested.

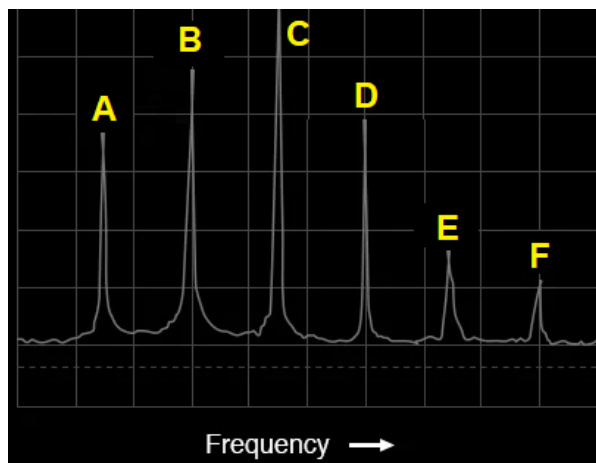
Q54. You have a small 50uA movement meter which has to be used to measure the voltage of 0-20V DC. The meter has a resistance of 50Ω. What value of resistor should be used and how should this be installed in relation to the meter?

- A. 400kΩ in series
- B. 400kΩ in parallel
- C. 20kΩ in series
- D. 20kΩ in parallel

Q55. You are using an RF voltmeter which is designed to read voltage at RMS value. The meter shows, when you transmit CW from your transceiver with a 50Ω load, a reading of 150V. This represents a power rating of?

- A. 1.3kW
- B. 450W
- C. 300W
- D. 250W

Q56.



You see the above on a spectrum analyser which of the following signals is that of the fundamental frequency.

- A. D
- B. C
- C. B
- D. A

Q57. What is the gain of the antenna system where the antenna is fed with 20W (at the feedpoint) and the output of the antenna is effectively 1500W?

- A. 12dB
- B. 14dB
- C. 18dB
- D. 8dB

Q58. You have a capacitor with a value of 100pF. The online specification states that it is $-200\text{ppm}/^\circ\text{C}$. Should the capacitor rise in temperature by 12°C , what would the value of the capacitor be (not including any manufacturing tolerances).

- A. 99.76pF
- B. 76pF
- C. 100.24pF
- D. 0.24pF

ANSWERS

Q1 = D

Q2 = C

Q3 = A

Q4 = B

Q5 = D

Q6 = C

Q7 = C

Q8 = B

Q9 = C

Q10 = D

Q11 = B

Q12 = C

Q13 = C

Q14 = D

Q15 = A

Q16 = B

Q17 = B

Q18 = B

Q19 = B

Q20 = C

Q21 = C

Q22 = D

Q23 = A

Q24 = C

Q25 = A

Q26 = B

Q27 = B

Q28 = D

Q29 = D

Q30 = A

Q31 = C

Q32 = A

Q33 = A

Q34 = A

Q35 = B

Q36 = B

Q37 = A

Q38 = B

Q39 = C

Q40 = C

Q41 = D

Q42 = C

Q43 = B

Q44 = D

Q45 = B

Q46 = B

Q47 = D

Q48 = B

Q49 = A

Q50 = B

Q51 = D

Q52 = C

Q53 = D

Q54 = A

Q55 = B

Q56 = D

Q57 = C

Q58 = A