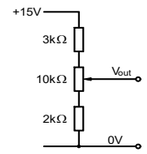
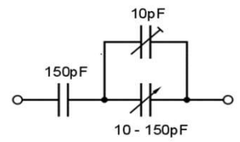
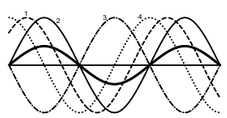
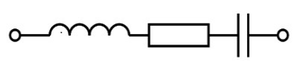
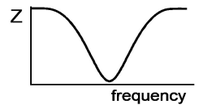
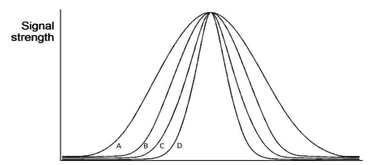
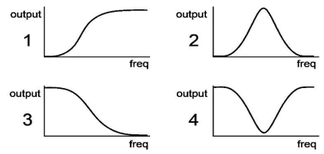
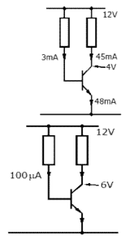
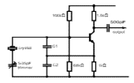
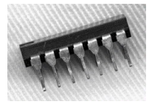
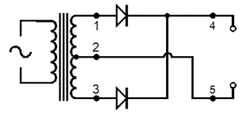
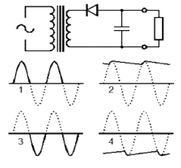
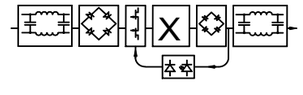
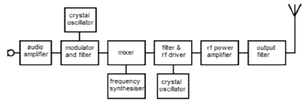
Syllabus 2019. Sample Questions - Intermediate Level

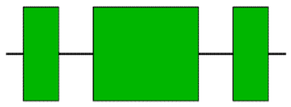
Syllabus Ref	Question Num	Chapter Description	Section Description	Mock Questions	Stem Graphic	D1 Graphic	D2 Graphic	D3 Graphic	D4 Graphic
1A4	1	Nature of amateur radio, types of licence and call signs	Section 1 – Licensing conditions and station identification	Revocation of an amateur licence is likely to occur if A. the annual fee is not paid B. the amateur's details are not updated at least once per year C.*the amateur's details are not updated at least once every five years D. no transmissions have been made in a two year period.					
1B1	1	Operators and supervision	Section 1 – Licensing conditions and station identification	As an intermediate licence holder you are directly supervising another UK licenced amateur. He/she must A. Obey the terms of their licence. B.* Obey the terms of your licence. C. Obey the terms of either licence. D. Give both callsigns as identification.					
1B2	1	Operators and supervision	Section 1 – Licensing conditions and station identification	You are visiting your friend who is a Full licence holder and using his transmitter at 200 watts. Your friend leaves the room. You may continue operating A. at 200 Watts because your friend is still on the premises B. at 200 Watts because your friend is supervising you using a hand-held. C.* but must use your own callsign and licence conditions. D. at the same power but must use your own callsign.					
1C1	2	Messages	Section 1 – Licensing conditions and station identification	In times of a national disaster an Intermediate licensee may A.* pass messages on behalf of non licenced persons B. use any radio frequency requested C. only use bands with Primary status D. only transmit if asked by a User Service					
1C2	2	Messages	Section 1 – Licensing conditions and station identification	Which of the following is NOT a User Service? A. The Salvation Army. B. The Royal Voluntary Service. C. The Fire Brigade. D.* The Office of Communications.					
1C3	2	Messages	Section 1 – Licensing conditions and station identification	You are providing an on-air talk in to guide club members to a camp site. As other members drive into range and wish to speak they MUST A. exchange callsigns with you as the leader of the group. B. await their turn to call in to join the group C. just chip in giving their name on the first over. D.* exchange callsigns with any member of the group.					
1D1	3	Apparatus, inspection and closedown	Section 1 – Licensing conditions and station identification	You may be required to reduce power by A. a member of the user services. B. a neighbour complaining about your installation. C. your local authority. D.* a person authorised by Ofcom.					
1D2	3	Apparatus, inspection and closedown	Section 1 – Licensing conditions and station identification	You must stop operating your station if A.* directed by a person authorised by Ofcom. B. you receive a complaint from a neighbour. C. ordered to do so by the RSGB. D. requested to so by the local police.					
1E1	4	Unattended and remote control operation	Section 1 – Licensing conditions and station identification	To set up a beacon used for direction finding you must have A. a Foundation licence. B.* at least an Intermediate licence. C. only a Full licence. D. any licence.					
1E2	4	Unattended and remote control operation	Section 1 – Licensing conditions and station identification	An Intermediate licensee may set up a remotely operated transmitter provided that A. the remote control is connected using secure encryption. B. the remote control is connected using a secure internet connection. C. the remote control is transmitted on amateur band at less than 10W p.e.p. e.r.p. D. the remote control is transmitted on amateur band at no more than 500 mW p.e.p. e.r.p.					
1F1	5	CEPT and international	Section 1 – Licensing conditions and station identification	You wish to travel abroad and take your transmitter with you. If you wish to use your transmitter you must A.* seek permission of the licencing authority in the countries you are visiting before using your transmitter. B. notify Ofcom of the counties that you will be visiting. C. check that your transmitter can operate on the frequencies permitted in the country you are visiting. D. check to see that the country you are visiting is covered by the C.E.P.T. agreement.					
1G1	6	Licence schedule	Section 1 – Licensing conditions and station identification	Which amateur band is allocated to the Amateur Service on a Primary basis but not at all for satellite use? A 1.850 -2.000MHz B* 7.100 - 7.200MHz C 10.100 - 10.150MHz D 24.890 - 24.990MHz					
1G2	6	Licence schedule	Section 1 – Licensing conditions and station identification	Which amateur band is allocated on a Primary basis but where amateurs must accept interference from ISM users. A.* 24000 - 24050MHz B. 5830 - 5850MHz C. 5755 - 5765MHz D.50 - 51MHz					
2A1	7	Fundamental theory	Section 2 – Technical aspects	Which capacitor, when accurately measured is within tolerance if marked as 3.3μF ± 20%? A 4.4μF B* 3.9μF C 2.6μF D 2.5μF					

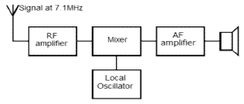
2C1	7	Resistance	Section 2 – Technical aspects	You have a three resistors with the values 10Ω, 20Ω and 60Ω. What is the minimum resistance that these resistors can be connected together to provide. A. 30Ω B.* 6Ω C. 90Ω D. 10Ω	
2C2	8	Resistance	Section 2 – Technical aspects	What are the maximum and minimum output voltages as the potentiometer is adjusted? A Max 15 Min 0 B Max 12 Min 1 C Max* 12 Min 2 D Max 10 Min 2	
2C3	8	Resistance	Section 2 – Technical aspects	A radio receiver draws 2A from a 12V power supply. However when the radio is turned off the supply voltage increases to 13V. What is the source resistance? A 6.5Ω B 1.0Ω C 2.0Ω D* 0.5Ω	
2D1	9	Reactive components	Section 2 – Technical aspects	The capacitance of a capacitor depends on the A charging current and voltage. B* material between the plates . C thickness of the plates. D frequency of the applied signal.	
2D2	9	Reactive components	Section 2 – Technical aspects	Approximately, what is the maximum capacitance that can be achieved by the arrangement of capacitors shown in the diagram? A. 150pF. B.* 77pF. C. 310pF. D. 170pF.	
2D3	9	Reactive components	Section 2 – Technical aspects	Which type of capacitor must be connected the correct way round? A.* Electrolytic. B. Variable. C. Ceramic. D. Polyester	
2D4	10	Reactive components	Section 2 – Technical aspects	Forming a wire into a coil in an inductor causes A.* the magnetic field to be concentrated. B. a decrease in capacitance between turns. C. a reduction of resistance. D. a reduction of the stored charge.	
2D5	10	Reactive components	Section 2 – Technical aspects	What is the minimum inductance of a circuit containing inductors of 1H, 2H and 3H? A* 0.55H B 1.83H C 1H D 0.5H	
2D6	10	Reactive components	Section 2 – Technical aspects	Which of the following increases the inductance of a coil? A. reducing coil diameter. B.* increasing coil diameter. C. decreasing the number of turns in the coil. D. increasing the spacing between turns in the coil.	
2E1	11	AC theory	Section 2 – Technical aspects	A capacitor is able to A.* pass an alternating current. B. pass a direct current. C. store energy in a magnetic field. D. only operate if air spaced.	
2E2	11	AC theory	Section 2 – Technical aspects	The periodic time for a frequency of 10MHz is A.* 0.1µs B. 1.0µs C. 1.0ms D. 0.1ms	
2E3	11	AC theory	Section 2 – Technical aspects	The current through and voltage across a component which is a pure reactive (L or C) are displayed on a screen. The bold line shows the current, which line will correctly shown the voltage? A line 1. B line 2. C line 3. D* line 4.	
2E4	12	AC theory	Section 2 – Technical aspects	The ratio of the RMS potential difference and the RMS current in a capacitor is known as A.* reactance. B. resistance. C. inductance. D. capacitance.	
2E5	12	AC theory	Section 2 – Technical aspects	The reactance of an inductor is a measure of A. the amount of energy stored in its magnetic field. B. the quantity of charge stored in its electric field. C.* the ratio of the RMS current and RMS voltage. D. The ratio of the RMS current to the peak current.	
2E6	12	AC theory	Section 2 – Technical aspects	The circuit shown energy is transferred to heat in A. C and stored in R and L. B.* R and stored in L and C. C. L and C and stored in R. D. L and stored in R and C.	

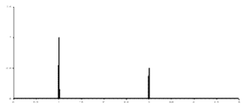
2E7	13	AC theory	Section 2 – Technical aspects	A radio broadcast is on 15.1 metres. What is the frequency of transmission? A. 21MHZ. B. 18.15MHz. C* 19.86MHz. D. 1.98MHz.	
2E8	13	AC theory	Section 2 – Technical aspects	A long twin wire feeder connects a 30m broadcast transmitter to its antenna. A probe shows the voltage on the line to be at its positive peak at a certain instant in time. A similar probe 15m towards the antenna will, at the exact same time, shows A the same size positive peak. B * the same size negative peak. C zero. D about half voltage.	
2F1	14	Digital signals	Section 2 – Technical aspects	A good audio signal is being sampled to convert it to digital for storage and playback later when it sounds distorted. To try to solve the problem the sample rate is doubled but it still sounds distorted. What should be tried next? A Try halving the sample rate to reduce the amount of data. B Re-recording the original analogue signal and re-sample. C* Increase the number of data bits to record each sample. D Reverse the polarity of the audio leads to the sampling device.	
2G1	15	Transformers	Section 2 – Technical aspects	The energy is coupled from the primary to the secondary windings of a transformer by A capacitive coupling B* via the magnetic field C the alternating voltage D frequency resonance	
2H1	16	Tuned circuits and resonance	Section 2 – Technical aspects	In the graph shown, the frequency indicated at f_a is known as A. the reactance frequency. B.* the resonant frequency. C. the critical frequency. D. the cut off frequency.	
2H2	16	Tuned circuits and resonance	Section 2 – Technical aspects	In a tuned circuit the graph shows. A.* L and C in series. B. L and C in parallel. C. L and R in series. D. L and R in parallel	
2H3	16	Tuned circuits and resonance	Section 2 – Technical aspects	In a tuned circuit, the resonant frequency will be increased by A. increasing either L or C. B.* decreasing either L or C C. increasing the voltage across either L or C. D. decreasing the voltage across either L or C.	
2H4	16	Tuned circuits and resonance	Section 2 – Technical aspects	Which tuned circuit has the greatest selectivity. A. B. C. D.*	
2H5	16	Tuned circuits and resonance	Section 2 – Technical aspects	Which of the following diagrams is a high pass filter. A.* 1 B. 2 C. 3 D. 4	
2I1	17	Semiconductor devices	Section 2 – Technical aspects	A semiconductor diode, when the voltage applied exceeds the forward voltage A.* will conduct current in one direction only B. conducts current in both directions. C. amplifies the current. D. blocks the current in both directions.	
2I2	17	Semiconductor devices	Section 2 – Technical aspects	The capacitance of a variable capacitance diode A. increases with increasing voltage when forward biased. B. decreases with increasing voltage when forward biased. C. increases with increasing voltage when reverse biased. D.* increases with decreasing voltage when reverse biased.	
2I3	17	Semiconductor devices	Section 2 – Technical aspects	The drawing shows a transistor working properly in a circuit. What is the value of b for the transistor? A* 15 B 16 C 45 D 48	
2I4	18	Semiconductor devices	Section 2 – Technical aspects	The diagram shows part of a transistor amplifier circuit with all the designed values. The base current is designed to be 100mA but the resistor is at the limit of its tolerance and the actual base current is 110mA. What will the actual collector voltage be? A 6V B 6.6V C* 5.4V D 3.0V	
2I5	18	Semiconductor devices	Section 2 – Technical aspects	What is the purpose of biasing a transistor? A To prevent it causing RF interference to other parts of the circuit. B* To ensure it works as the circuit designer had intended. C To suppress any tendency to oscillate if the value of b is higher than expected. D To ensure correct matching to the following stage of the overall circuit.	

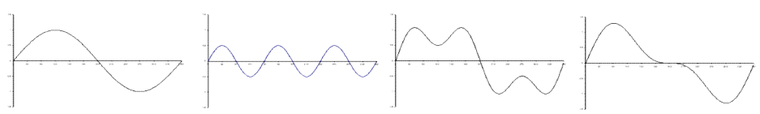
2I6	18	Semiconductor devices	Section 2 – Technical aspects	What is the function of the crystal in the circuit shown? A To set the correct biasing for the transistor. B To avoid key clicks when the circuit is used for CW. C To stabilise the amplitude of the output signal. D* To set the frequency at which the circuit will operate.	
2I7	20	Semiconductor devices	Section 2 – Technical aspects	The photograph shows an electronic component often referred to as a A semiconductor device B* integrated circuit C surface mount component D monolithic device	
2J1	19	Cells and power supplies	Section 2 – Technical aspects	Rechargeable batteries are often marked with a value quoted in Ampere-hours. What does this value mean. A.* An indication of the stored energy when fully charged. B. The time after which the battery should be recharged. C. The time for which the battery will power the connected device. D. The maximum charging current at which the battery can be safely charged.	
2J2	19	Cells and power supplies	Section 2 – Technical aspects	Part of a mains powered DC power supply is shown in the diagram. The smoothing capacitor is missing, where should it be inserted? A Between points 1 and 2. B Between points 2 and 3. C Between points 1 and 3. D* Between points 4 and 5.	
2J3	19	Cells and power supplies	Section 2 – Technical aspects	Which waveform will be seen across the output terminals of this mains powered power supply? A Waveform 1. B Waveform 2. C Waveform 3. D* Waveform 4.	
2J4	20	Cells and power supplies	Section 2 – Technical aspects	What type of component is in the box marked X? A Filter. B* Transformer. C Digital controller. D Smoothing capacitor.	
3A2	21	Transmitter concepts	Section 3 – Transmitters and receivers	If an AM transmission has a Depth of Modulation of 0.1 then the audio signal will be A* fairly quiet. B quite loud. C low in frequency. D high in frequency.	
3A3	21	Transmitter concepts	Section 3 – Transmitters and receivers	Compared to AM, SSB has A the sidebands removed. B one sideband removed. C the carrier reduced in amplitude. D* one sideband and no carrier.	
3B1	21	Transmitter architecture	Section 3 – Transmitters and receivers	One of the functions shown in the block diagram of an SSB transmitter has been put in the wrong place. Which one? A.* A crystal oscillator. B. An audio amplifier. C. The frequency synthesiser. D. The mixer.	
3C1	21	Oscillators	Section 3 – Transmitters and receivers	Which statement about VFO and crystal oscillators is correct? A. A VFO is very stable and a crystal oscillator is tuneable. B.* A VFO is tuneable and a crystal oscillator is very stable. C. The stability of the VFO and crystal oscillators are similar. D. The tuning range of a crystal oscillator is greater than a VFO.	
3C2	21	Oscillators	Section 3 – Transmitters and receivers	The stability of an oscillator can be improved by A locating the oscillator next to the power amplifier it is intended to drive. B running the local oscillator from the common DC supply to the control circuitry. C keeping audio and RF circuits housed in separate ventilated enclosures. D* running the oscillator from its own power supply separate from other circuits.	
3C3	21	Oscillators	Section 3 – Transmitters and receivers	A direct digital synthesiser generates sine waves by A* relying on a look-up table of the voltages levels required to form a sine wave. B calculating the required voltage levels from downloaded software routines. C digitising the levels generated by a controlled variable frequency oscillator. D digitally mixing two signals and selecting either the sum or difference output.	
3E1	22	Microphone amplifiers and modulators	Section 3 – Transmitters and receivers	The output from a balanced modulator contains A the carrier modulated with the audio modulating signal. B* two sidebands but with the carrier suppressed. C two sidebands but only one of which is modulated. D one modulated sideband with the carrier suppressed.	
3E2	22	Microphone amplifiers and modulators	Section 3 – Transmitters and receivers	The SSB filter in a transmitter removes A the carrier from the output of the modulator. B the carrier and one of the two sidebands. C one sideband leaving the carrier and other sideband. D* one of the two sidebands from the modulator.	
3E3	22	Microphone amplifiers and modulators	Section 3 – Transmitters and receivers	Frequency modulation is achieved by A mixing the audio and carrier signals in a mixer circuit. B adding the audio signal to the ALC feedback from the modulator. C combining the audio and carrier signals in a frequency discriminator. D* using a variable capacitance diode to control an LC oscillator.	

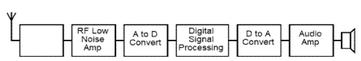
3F1	22	RF power amplifiers	Section 3 – Transmitters and receivers	The power amplifier in a transmitter has an efficiency of 60% and provides 50W of RF at its output. How much power is lost as heat? A 84W B 30W C* 33W D 20W
3G2	23	Transmitter interference	Section 3 – Transmitters and receivers	A 2m transceiver uses an oscillator and frequency modulator at 48MHz which is then mixed up to 145MHz for transmission. One risk with this design is that A the RF signal is likely to drift in frequency. B* there will spurious signals around 144MHz. C the received audio will be horribly distorted. D the RF output power will be difficult to control.
3G3	23	Transmitter interference	Section 3 – Transmitters and receivers	The purpose of a notch filter is to attenuate A all signals below a set frequency. B all signals above a set frequency. C signals above and below a set frequency. D* signals at and close to a set frequency.
3G4	23	Transmitter interference	Section 3 – Transmitters and receivers	The drawing shows the envelope of a CW (Morse) transmitter. A likely problem with this transmission is A* key clicks occurring over several kHz each side of the intended transmission. B key clicks occurring on harmonics of the intended transmission. C chirp affecting the sound of the received Morse signal. D chirp affecting signals on harmonics of the Morse signal.
3G5	23	Transmitter interference	Section 3 – Transmitters and receivers	Chirp is caused by A Locating the oscillator too close to the power amplifier. B Failing to screen the audio oscillator circuity from the power amplifier stages. C* Running the oscillator from the same DC supply as the power amplifier. D Leaving the oscillator running all the time on transmit and receive.
3H2	24	Receiver concepts	Section 3 – Transmitters and receivers	The direct conversion receiver shown is receiving a signal at 7.1MHz, what frequency should the local oscillator be set to correctly receive and copy the signal? A 3kHz. B* 7.1MHz C 465kHz D 7.565MHz
3H3	24	Receiver concepts	Section 3 – Transmitters and receivers	The sensitivity of a radio receiver is a guide to its ability to A reject unwanted signals on adjacent frequencies. B withstand strong signals without causing reception problems. C demodulate signals, especially SSB, clearly and correctly. D* receive weak signals without them being drowned in noise.
3H4	24	Receiver concepts	Section 3 – Transmitters and receivers	If the tuning sections of a radio receiver have a relatively low Q-factor then A* adjacent RF signals are more likely to interfere with the wanted signal. B adjacent RF signals are less likely to interfere with the wanted signal. C careful tuning is essential to pick up all the wanted signal. D background radio frequency noise will be markedly reduced.
3I1	25	Superheterodyne concepts	Section 3 – Transmitters and receivers	In the medium wave band up to 3MHz a tuned radio frequency, TRF, receiver can work adequately. Above that it is necessary to move to a Superhet architecture. Why? A Achieving sufficient gain at higher frequencies is not easy. B* A TRF receiver does not have adequate selectivity at higher frequencies. C Radio noise gets worse at higher frequencies and needs to be filtered out. D It is not possible to provide automatic gain control in a TRF receiver.
3I2	25	Superheterodyne concepts	Section 3 – Transmitters and receivers	A Superhet receiver is tuned to 14.1MHz and the Intermediate frequency is 460kHz. A suitable frequency for the Local Oscillator is A 14.1MHz B 460kHz C* 13.64MHz D 14.46MHz
3I3	25	Superheterodyne concepts	Section 3 – Transmitters and receivers	In a Superhet receiver the Intermediate Frequency A keeps in step with the tuning of the receiver. B* remains on a fixed frequency as the receiver is tuned. C is a constant offset in frequency from the local oscillator. D is midway between the tuned frequency and the local oscillator.
3K1	26	Demodulation	Section 3 – Transmitters and receivers	A Superhet receiver is tuned to 14.0550MHz and its Intermediate Frequency is 460kHz. A suitable frequency for the Beat Frequency Oscillator is A 14.0550MHz B 14.0557MHz C 460kHz D* 459.3kHz
3L1	26	Automatic gain control (AGC)	Section 3 – Transmitters and receivers	The signal for the Automatic Gain Control, AGC, is derived A* at the detector stage and controls the gain of the IF amplifier. B in the RF amplifier and controls the gain of the IF amplifier. C at the input to the audio amplifier and controls the gain of the RF amplifier. D in the IF amplifier and controls the gain of the audio amplifier.
3M1	27	SDR transmitters and receivers	Section 3 – Transmitters and receivers	One advantage of a software defined radio receiver is that A the receiver is inherently much more sensitive. B two RF signals on the same frequency can be separated out. C a digital frequency display simplifies tuning to the wanted signal. D* the intermediate frequency filters can be much more selective.
3M2	27	SDR transmitters and receivers	Section 3 – Transmitters and receivers	The drawing shows a signal in the frequency domain, which time domain signal was it derived from? A Signal 1. B Signal 2. C * Signal 3. D Signal 4. Note: The four answers may not be in numerical order.
3M3	27	SDR transmitters and receivers	Section 3 – Transmitters and receivers	An SDR receiver is shown in the diagram. What function is performed in the blank box? A Fourier transform. B Sampling. C* Low-pass filtering. D High-pass filtering.

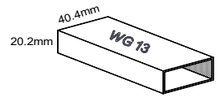




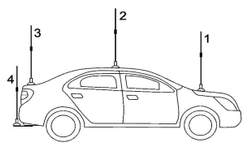






4A1	28	Feeders	Section 4 – Feeders and antennas	Waveguide size WG13 has internal dimensions of approximately 40.4 x 20.2 mm. What is the lowest frequency AMATEUR band for which it is suitable? A 3.71GHz B* 5.65GHz C 7.43GHz D 10GHz	
4A2	28	Feeders	Section 4 – Feeders and antennas	An advantage of using twin feeder over coax is that, A it is much easier to bend round corners. B is unaffected by nearby metallic objects. C* it usually has a lower RF loss than coax. D it is much cheaper.	
4A3	28	Feeders	Section 4 – Feeders and antennas	The characteristic impedance of a feeder is, A normally 50Ω for twin feeder and 600Ω for coax. B independent of the diameter and spacing of its wires. C* dependent on the diameter and spacing of its wires. D determined solely by the material used for its insulation.	
4B1	28	Baluns	Section 4 – Feeders and antennas	A choke balun is used on a coax feeder to A. amplify any common mode currents. B. balance the forward and reflected currents. C.* attenuate the current on the outside of the coax braid D choke off the signal from a nearby transmitter	
4C2	29	Antenna concepts	Section 4 – Feeders and antennas	The beam width of a Yagi antenna is the A. average width of the reflector and director elements. B . thickness of the load bearing pole. C.* angle between the half power points of the radiated RF D . length of the RF driven element.	
4C3	29	Antenna concepts	Section 4 – Feeders and antennas	An isotropic radiator is A. real and has measurable dimensions B.* a theoretical point source of equal radiation in all directions C. said to have a gain of 2.15 dB compared to a dipole D. used only in the troposphere.	
4C4	29	Antenna concepts	Section 4 – Feeders and antennas	The angle of radiation of a vertical antenna is the angle A. between the vertical antenna and the direction of radiated RF. B.* between the ground and the direction of radiated RF C. the angle in the horizontal plane in which there is maximum field D. the recommended angle at which the supporting guy ropes are set.	
4C5	29	Antenna concepts	Section 4 – Feeders and antennas	4C5 A centre fed half wave dipole will have a feed point impedance of A.* 73Ω in free space at its design frequency B. 73Ω in air and at any frequency C. 50Ω near the ground at any frequency D. 50Ω in free space	
4D1	30	Types of antenna	Section 4 – Feeders and antennas	A Yagi antenna has a A. half wave driven element with slightly longer director elements B. full wave driven element and a shorter reflector element C. half wave driven element with several reflecting elements D.* half wave driven element, a longer reflector and shorter reflecting elements.	
4D2	30	Types of antenna	Section 4 – Feeders and antennas	An antenna trap is a parallel tuned circuit that A. stops spurious signals being radiated from the transmitter B.* enables two bands to be received on a single dipole C. stops birds sitting on a dipole at high voltage D. prevents RF from electric motors reaching the feeder	
4E1	31	Standing waves	Section 4 – Feeders and antennas	Standing waves are formed on a feeder when, A.* reflected waves from the antenna combine with those from the transmitter. B. when the feed impedance of the antenna and feeder are 50Ω. C. the feeder loss for the reflected wave is greater than that for the forward wave. D. when the SWR is less than 1.0.	
4F1	31	Antenna matching units	Section 4 – Feeders and antennas	A modern transceiver will have a built in AMU to ensure that the A. impedance of the antenna, feeder, and transceiver is less than 50 Ω B.* load presented to the transceiver ~~is exactly 50Ω impedance.~~ is matched to its output C. antenna feed point is perfectly matched to the feeder D. internal components of the transceiver work within their tolerances	
4G1	31	Dummy loads	Section 4 – Feeders and antennas	A dummy load consists of a resistor mounted on a heat sink. The resistor A. is wire wound to give minimal reactance. B. changes electrical energy to very low frequency RF. C.* has a purely resistive impedance of 50Ω. D. is rated at 50% of the maximum power load.	
4H1	31	Plugs and sockets	Section 4 – Feeders and antennas	The single most important reason for using a PL259 plug and SO 239 socket to connect an antenna feeder to a transceiver is to A. minimise the chance of accidental disconnection. B.* contain the RF signal within the connection. C. ensure electrical contact is only made via soldered joints. D. match 75Ω feeder to the 50Ω output of the transceiver.	
5A2	32	Radio propagation: key concepts	Section 5 – Propagation	The skip distance is the distance between the A. end of ground wave reception and start of sky wave reception. B. transmitting antenna and the end of ground wave reception. C.* transmitting antenna and start of sky wave reception. D. end of ground wave reception and the end of sky wave reception.	
5A3	32	Radio propagation: key concepts	Section 5 – Propagation	The signal strength received from a ground wave A. gets weaker with greater distance and weaker with lower frequency. B.* gets weaker with greater distance and stronger with lower frequency. C. gets stronger with greater distance when there are lots of sun spots. D. gets stronger with higher frequency when there are lots of sun spots.	
5A4	32	Radio propagation: key concepts	Section 5 – Propagation	Which of the following statements is true about electro-magnetic waves? A.* The electric field defines the polarisation of the wave and the magnetic field is at right angles to it. B. The magnetic field defines the polarisation of the wave and the electric field is at right angles to it. C. the electric field defines the polarisation of the wave and the magnetic field leads it by 180 degrees. D. the magnetic field defines the polarisation of the wave and the electric field leads it by 180 degrees.	

5B1	33	Ionosphere	Section 5 – Propagation	The ionosphere is made up of A. radioactive gases B.* conductive gases C. ozone D water vapour
5B2	33	Ionosphere	Section 5 – Propagation	The sunspot cycle is approximately A. 1 year. B. 5 years. C.* 11 years D. 76 years.
5B3	33	Ionosphere	Section 5 – Propagation	The F1 and F2 layers of the ionosphere combine A. during daylight hours. B.* during night time hours. C. in the summer months. D. in the winter months.
5B4	34	Ionosphere	Section 5 – Propagation	Which of the following statements is true? A. The D layer absorbs higher frequencies and tends to disappear during the day. B.* The D layer absorbs lower radio frequencies and tends to disappear at night. C. The LUF must be higher than the MUF for ionospheric propagation to occur. D. The LUF is higher than the MUF in winter.
5B5	34	Ionosphere	Section 5 – Propagation	In the 24MHz and 28MHz bands propagation can be significantly A.* improved by highly ionised gases in the E layer. B. improved by thunderstorms. C. degraded by highly ionised gases in the E layer. D. degraded by bright sunshine.
5C3	34	VHF and above	Section 5 – Propagation	Multiwave propagation arises when A. two amateurs are transmitting on the same frequency at the same time. B. signals are reflected off buildings or aircraft when there is no direct signal path. C. signals are received from ground wave and sky wave propagation, D.* signals are reflected off buildings or aircraft in addition to the un-reflected signal.
6A1	35	EMC concepts	Section 6 – Electro magnetic compatibility (EMC)	A basic principle of Electromagnetic compatibility is that apparatus should A.* function normally in its electromagnetic environment and without causing undue interference. B. not generate electromagnetic radiation other than through an antenna. C. withstand all electromagnetic radiations from other sources. D. not generate RF energy greater than that stipulated in the licence schedule.
6A2	35	EMC concepts	Section 6 – Electro magnetic compatibility (EMC)	The immunity of a receiving device can be improved by A. screening the transmitter. B.* filtering power, signal and control leads. C. transmitting on a lower frequency. D. transmitting on a lower power.
6A3	35	EMC concepts	Section 6 – Electro magnetic compatibility (EMC)	Modern receiving equipment may still be subject to interference A. if the SWR level at the transmitter is 1:1 B. if it bears the CE quality control mark. C.* because transmitters in domestic environments produce stronger RF fields than the agreed limits. D. because the household has a Protective Multiple Earth (PME) earthing system.
6A4	35	EMC concepts	Section 6 – Electro magnetic compatibility (EMC)	New electronic equipment should meet the immunity standards as defined by A. Ofcom. B. The British Standards Institute. C. The BBC. D. The RSGB.
6B1	36	Sources of interference and their effects	Section 6 – Electro magnetic compatibility (EMC)	Which mode of transmission is most likely to induce speech like sounds in audio equipment or landline phones? A.* SSB. B. FM. C. CW. D. PSK.
6B2	36	Sources of interference and their effects	Section 6 – Electro magnetic compatibility (EMC)	Which of the following non radio sources is least likely to cause interference. A. A plasma TV. B.* A soldering iron. C. LED lighting. D. An electric motor.
6B3	36	Sources of interference and their effects	Section 6 – Electro magnetic compatibility (EMC)	Interference to Digital Audio Broadcast (DAB) receivers and digital TV sets is often characterised by A. random voice sounds on DAB equipment and a herringbone pattern on digital TV. B. random channel switching on both DAB equipment and digital TV. C. humming noises on DAB equipment and horizonal lines on digital TV. D.* drop out of sound on DAB equipment, frozen or pixelated pictures on digital TV.
6C1	36	Routes of entry	Section 6 – Electro magnetic compatibility (EMC)	Direct pickup A.* is independent of the transmitted frequency. B. depends on the transmitted frequency. C. can be reduced by fitting a filter to the mains lead of the receiver. D. can be reduced by fitting a filter to the mains lead of the transmitter.
6C2	36	Routes of entry	Section 6 – Electro magnetic compatibility (EMC)	One effect of fitting a masthead TV amplifier is that A. the TV picture becomes brighter. B. ghost images may appear on the TV screen C. immunity from amateur signals is improved D.* the TV input can be overloaded by amateur signals
6D1	37	Filtering and remedial measures	Section 6 – Electro magnetic compatibility (EMC)	Which of the following will help prevent RF interference entering the mains wiring. A. Fitting ferrite chokes to the mains leads of receiving equipment. B.* Fitting ferrite chokes to the mains leads of the transmitter power supply. C. Connecting the RF earth of the transmitter to the mains earth. D. Fitting a ferrite choke to the download of the TV antenna.
6D2	37	Filtering and remedial measures	Section 6 – Electro magnetic compatibility (EMC)	Fitting a choke or balun on a feeder can be used to attenuate A.* common mode currents. B. differential mode currents. C. direct currents. D. balanced currents.

6D3	37	Filtering and remedial measures	Section 6 – Electro magnetic compatibility (EMC)	Tests to detect harmonic emissions can be carried using A. an SWR meter on multiples of the frequency being tested. B. a general coverage receiver tuned in to the transmitted signals frequency. C.* a general coverage recover tuned into multiples of the transmitted signals frequency. D. a dummy load on multiples of the frequency being tested.
6D4	37	Filtering and remedial measures	Section 6 – Electro magnetic compatibility (EMC)	You suspect that radiated RF interference may be getting into a domestic radio via the mains wiring. To test this you could A.* fit a dummy load to the antenna of the transmitter to see if the interference stops. B. reduce the transmitted power until the interference stops. C. connect the earth terminal of the transmitter to the mains earth. D. fit a filter to the transmitters mains power lead.
6E1	38	Station design and antenna placement/general principles	Section 6 – Electro magnetic compatibility (EMC)	Which of the following types of antenna installation are likely to give rise to the LEAST amount of RF interference? A.* A balanced dipole. B. A long wire antenna, end fed at a point closest to the house. C. A long wire antenna, end fed at a point furthest from the house. D. A 1/4 wave vertical dipole *
6E2	38	Station design and antenna placement/general principles	Section 6 – Electro magnetic compatibility (EMC)	A good RF earth is achieved by connecting the earth terminal of the transmitter to A. the mains earth using very thick cable. B. a tent peg in the ground using co-axial cable. C.* a long piece of buried copper rod using a short thick cable D. the metalwork of the rising water mains through a coil of wire.
6E3	38	Station design and antenna placement/general principles	Section 6 – Electro magnetic compatibility (EMC)	The most important risk of placing a transmitting antenna in the loft close to mains wiring and TV aerials is that A. the noise of the mains wiring will be heard on the amateur receiver, masking weak signals. B. the roof will cause considerable loss of signal strength both on transmit and receive. C. the TV signals are likely to interfere with the amateur radio equipment when receiving. D.* amateur transmissions will be picked up by the mains TV wiring and conducted into other devices.
6F2	38	Station design and antenna placement/mobile installations	Section 6 – Electro magnetic compatibility (EMC)	When installing an amateur radio transceiver in a motor vehicle care should be taken, as far as possible, to A. run the transceiver and antenna wiring in parallel with the vehicle wiring. B.* run the transceiver and antenna wiring at 90 degrees to the vehicle wiring. C. tape the transceiver and antenna wiring to the vehicle wiring. D. run the transmitter and antenna wiring underneath the vehicle.
6F3	38	Station design and antenna placement/mobile installations	Section 6 – Electro magnetic compatibility (EMC)	Which of the following diagrams shows the best position for mounting an amateur radio antenna on a vehicle? A. 1 B.* 2 C. 3 D. 4  *
7A3	39	Good operating practices and procedures	Section 7 – Operating practices and procedures	You are having a conversation with PA1ABC. PA1ABC is located in A. Papua New Guinea. B. The Philippines. C. The Netherlands. D. Canada.
7A4	39	Good operating practices and procedures	Section 7 – Operating practices and procedures	During a contest, radio amateurs usually exchange signal strength (RST) information and which of the following? A.* Serial number. B. Postal address. C. Postcode. D. Frequency of transmission.
7B1	39	Band plans	Section 7 – Operating practices and procedures	In which of the following bands is it permissible to hold an SSB contest. A. 30 Metres. B.* 20 Metres. C. 17 Metres. D. 12 Metres
7E1	40	Codes and abbreviations	Section 7 – Operating practices and procedures	You are engaged in a contact with another amateur radio and he requests you to QRO. You are being asked to A. change frequency. B.* increase power. C. acknowledge the contact. D. suspend operation of your station.
7F2	40	Digital interfaces	Section 7 – Operating practices and procedures	When connecting the sound output from your computer to the microphone input of your transceiver A. the transmitter will automatically adjust the input gain to prevent over driving. B.* programs running on the PC may cause unwanted sounds to be transmitted. C. transmissions must be in FM D. transmissions must be in AM.
7G1	40	Satellites	Section 7 – Operating practices and procedures	You are listening to a transmission from an amateur satellite and observe that the receive frequency appears to be increasing. The satellite is A. in geostationary orbit B. always within transmission range of Europe. C. only within transmission range on certain days D.* only within transmission range for a few minutes.
7G2	40	Satellites	Section 7 – Operating practices and procedures	When communicating with an amateur satellite, the uplink and downlink frequencies are A. Always in the same amateur band. B. Generally in the same amateur band. C.* Generally in different amateur bands. D. Always in different amateur bands.
7G3	40	Satellites	Section 7 – Operating practices and procedures	When communicating with an amateur satellite that is only within range for a few minutes, the signal received will appear A. stronger at the end of the transmission and weaker at the start B. stronger at the start of the transmission and weaker at the end C. at a lower frequency at the start of the transmission and higher at the end. D.* at lower frequency at the end of the transmission and higher at the start

7G4	40	Satellites	Section 7 – Operating practices and procedures	When communicating through an amateur satellite your transmit A.* power should be as low as possible. B. power should be as high as possible. C. frequency should be as low as possible. D. frequency should be as high as possible.
8A1	41	Electricity	Section 8 – Safety	when designing high voltage circuits it is a good idea to place suitable resistors A.* in parallel with smoothing capacitors. B. in parallel with all capacitors. C. in series with smoothing capacitors. D. in series with all capacitors.
8A2	42	Electricity	Section 8 – Safety	The symbol shown on an item of mains powered electrical apparatus indicates that A. The equipment must be connected to an RF earth. B. The equipment must be connected to the mains earth. C.* The equipment does not need to be connected to the mains earth. D. The equipment requires a waveguide to operate correctly.
8A4	42	Electricity	Section 8 – Safety	A transceiver powered from the mains uses 15 watts on receive and 750 watts on transmit. Which of the following fuses would be suitable for the mains plug. A. 3 amps. B.* 5 amps. C. 10 amps. D. 13 amps
8A6	41	Electricity	Section 8 – Safety	If working on live equipment, you should A. ensure that your body is fully earthed. B. wear protective goggles C. use both hands. D. *be completely isolated from earth.
8A8	42	Electricity	Section 8 – Safety	The main hazard when wearing metal jewellery or watch straps whilst working on vehicle electric systems is A. electrocution due to the high voltages. B.* burns or fire due to high currents. C. static electricity shocks. D. explosion caused by Helium emitted from the battery.
8B2	43	Using tools	Section 8 – Safety	To avoid injury when using screwdrivers, saws and similar tools it is advisable to A. keep your tools sharp. B.* work from behind the tool. C. keep your tools in a toolbox. D. use a tool belt.
8B3	43	Using tools	Section 8 – Safety	When using a saw or a drill on an item, to ensure safety you should A. wear gloves and a face mask. B.* secure the item in a vice or clamp. C. ensure the items is earthed. D. ensure plenty of ventilation.
8B4	43	Using tools	Section 8 – Safety	Before applying power to an electric drill ensure that A. the drill is fully earthed. B.* any chuck key used is removed. C. any chuck key is fully tightened. D. the drill is set to rotate anti-clockwise.
8B5	43	Using tools	Section 8 – Safety	The correct use of a centre punch will A.* reduce the chance of a drill bit slipping B. ensure accurate sawing C. make small holes when required D. assist accurate marking out
8B6	43	Using tools	Section 8 – Safety	A bench mounted pillar drill is safer to use because A. it does not generate swarf or sharp particles. B. it is quieter to use. C.* it is easier to control. D. both hands are needed to operate it.
8E1	41	Lightning	Section 8 – Safety	A gas discharge arrestor is used to A. prevent a lightning strike. B.* protect against build up of static charges. C. prevent static interference to reception. D. prevent surges in the mains supply.
9A1	44	Measurements	Section 9 – Measurements and construction	You wish to measure the voltage in a mains power supply using an analogue multi meter. Which of the following settings would be the most appropriate for your initial measurement. A. 1,000 ohms. B.* 1,000 volts AC. C. 25 volts AC. D. 25 amps DC.
9A2	44	Measurements	Section 9 – Measurements and construction	In the circuit shown A. Meter 1 is a voltmeter and meter 2 an ammeter. B.* Meter 1 is a ammeter and meter 2 is a voltmeter C. Meter 1 and meter 2 are both ammeters D. Meter 1 and meter 2 are both voltmeters
9A3	44	Measurements	Section 9 – Measurements and construction	The range on your digital multimeter is set to 480 volts. What is the voltage indicated on the reading shown in the diagram. A. 60 volts. B. 120 volts. C.* 240 volts. D. 20 volts.
9A5	44	Measurements	Section 9 – Measurements and construction	Which diagram shows the correct way to connect a volt meter and am ammeter to measure the power dissipated by the resistor.
9B1	45	Decibels	Section 9 – Measurements and construction	A transmitter has an output of 15 watts which is connected to a feeder with a loss of 3dB and finally into an antenna with a gain of 17dB. What is the effective radiated power from the antenna? A. 30 Watts. B. 150 Watts. C.* 375 Watts. D. 210 Watts.

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9C1	46	Components	Section 9 – Measurements and construction	A resistor is marked 5k6. Its resistance will be close to A. 56 ohms B. 560 ohms. C.* 5600 ohms. D. 56,000 ohms.
9D1	46	Construction	Section 9 – Measurements and construction	Thin metal sheet is often used in the construction of radio equipment to A.* reduce unwanted radiation between stages. B. assist with component cooling. C. isolate high voltages from low voltages. D. increase the rigidity of the radio chassis.
9E1	46	Soldering	Section 9 – Measurements and construction	Soldering is a method of A. heating flux to form glue which holds the items to be connected together B. using a hot iron to fuse the wires being connected together. C. welding metal surfaces being connected together D.* melting a metal alloy to flow around the components being connected together.
9E2	46	Soldering	Section 9 – Measurements and construction	Flux is used when soldering to: A.* help prevent an oxide layer forming on the surfaces to be soldered. B. reduce the temperature required for soldering. C. stick the surfaces together so that they do not move when being soldered. D. clean the surfaces of the components being soldered.
9E3	46	Soldering	Section 9 – Measurements and construction	Which of the following metals is the easiest to solder in radio circuitry? A. Aluminium. B. Stainless Steel. C. Copper. D. Cast iron.
9E4	46	Soldering	Section 9 – Measurements and construction	When in use, the tip of a soldering iron should be kept clear of oxide and tinned to A.* improve the conduction of heat into the soldered joint. B. prevent the soldering iron from overheating. C. help solder flow from the tip to the soldered joint. D. reduce the amount of flux used.