1

An Intermediate Licence holder may supervise
A no other person.
B any unlicensed person.
C any other radio amateur.
D any other UK radio amateur.

2

Under what circumstances, if any, are you permitted to send an obscured message?
A There are no such circumstances.
B If you believe it is appropriate to do so.
C If the message originator asks you to do so.
D If a User Service representative asks you to.

3

An amateur must keep a log
A of all transmissions from the station.
B of all times when the station is in use.
C only when requested by a person authorised by Ofcom.
D of checks performed from time to time to ensure undue interference is not caused.

4

An Intermediate amateur lives on a farm but the farmhouse is in a valley. A transceiver is set up in a suitable building on the highest part of the farm and is remotely controlled by a radio link. Which statement below is correct?
A The link power must be below 500mW and in an amateur band.
B The link power must be below 500mW pep and in an amateur band.
C The link power must be below 500mW pep e.r.p and in an amateur band.
D The link must be below 500mW and in an amateur band above 30MHz.

5

In order to operate in another CEPT country an Intermediate licensee must
A have a copy of their UK licence and the host country licence conditions.
B validate your UK licence at immigration control when first entering the host country.
C obey the CEPT licence conditions and also the conditions of your own UK licence.
D obtain special permission, if granted, by the host country’s licensing authority.

6

What is the maximum permitted RF output power for an Intermediate Licence holder operating on 1.850-2.000MHz
A 1W erp.
B 32W.
C 40W.
D 50W.
7. What current is drawn from the battery in the circuit shown?
   A. 1mA.
   B. 2mA.
   C. 3mA.
   D. 9mA.

8. When transmitting to a contact it is noticed that the supply voltage at the battery has fallen from 13V to about 11.5V. This is most likely to be due to the
   A. antenna being too close to the battery and causing RF interference.
   B. power cable between the battery and transmitter dropping too much voltage.
   C. internal resistance of the battery.
   D. increased losses in the transmitter.

9. What is the approximate capacitance of the circuit shown?
   A. 23μF.
   B. 58μF.
   C. 69μF.
   D. 91μF.

10. The purpose of coiling the wire of an inductor into a coil is to
    A. concentrate the magnetic field.
    B. minimise the likelihood of RF pickup.
    C. reduce the risk of unwanted radiation.
    D. reduce any back emf induced in the coil.

11. Which quantity(s), shown by the numbered arrows, will describe the phase relationship between the two sine waves in the drawing?
    A. Quantity 1.
    B. Quantities 1 and 2.
    C. Quantity 3.
    D. Quantities 3 and 4.
A resistor and capacitor are connected in series and fed from an AC supply. Which statement below is correct?

A The energy supplied to the resistor is dissipated as heat; the energy supplied to the capacitor is stored and returned to the circuit.
B The energy supplied to the resistor is dissipated as heat; the energy supplied to the capacitor is lost in the electric field.
C The energy supplied to the resistor is dissipated as heat; the energy supplied to the capacitor is stored and returned in the magnetic field.
D The energy supplied to both the resistor and capacitor are dissipated as heat but with a 90 degree phase difference.

The wavelength of a signal at 14.230MHz is

A 21.1cm.
B 47.4cm.
C 21.1m.
D 47.4m.

Any error in representing the amplitude of an analogue signal by digital sampling can be reduced by

A sampling the analogue signal more frequently.
B filtering the analogue signal prior to sampling.
C using more digital bits to quantify the analogue signal.
D filtering the digital signal after sampling.

The purpose of the iron core in a mains transformer is to

A concentrate the magnetic field to improve the efficiency of the transformer.
B provide a solid and safe support for the transformer windings.
C provide a metallic screen to minimise RF interference between the two windings.
D prevent external magnetic fields from affecting the transformers function.

The drawing shows an LC circuit and its frequency response. If the value of C is increased, the point ‘X’ on the frequency response graph will then to move in which direction?

A Direction 1
B Direction 2
C Direction 3
D Direction 4
17 The current flowing in the resistor will be
A  0A.
B  0.24A.
C  0.60A.
D  4.16A.

18 A feature of the circuit shown is that the frequency
A  of operation is continuously variable over an amateur band.
B  the frequency of operation is varied in small but discrete steps.
C  the frequency stability is relatively poor compared to other circuits.
D  the frequency of operation is fixed allowing its use as a reference.

19 The diagram shows a power supply and a number of waveforms that might be observed across the load resistor by using an oscilloscope. Which of the options below shows the correct waveforms, first with the switch S open and then with it closed?
A  S open: waveform 1    S closed: waveform 4.
C  S open: waveform 3    S closed: waveform 2.
D  S open: waveform 1    S closed: waveform 2.

20 A key feature of integrated circuit technology is that
A  each circuit function can be individually adjusted.
B  several functions can be combined in a single device.
C  unsoldering such devices is much easier.
D  higher voltages can be used to improve performance.
21. A transmitter using SSB modulation is more efficient because
   A transmitting the carrier avoids excessive power in the sidebands.
   B removing the unwanted sideband reduces the likelihood of interference.
   C the increased bandwidth over AM eases the process of demodulation.
   D all the transmitter power can be concentrated in the information content.

22. Frequency modulation can be produced by using
   A a variable capacitance diode.
   B a product detector.
   C a balanced mixer.
   D a balanced phase discriminator.

23. Which of the following responses would be produced by a high pass filter?
   A Response 1.
   B Response 2.
   C Response 3.
   D Response 4.

24. The purpose of the demodulator in a radio receiver is to.
   A remove the carrier leaving just the two sidebands.
   B recover the audio signal from the intermediate frequency.
   C ensure the levels applied to the mixer are of constant amplitude.
   D ensure the local oscillator is on the correct frequency.

25. The merit of the superheterodyne architecture for a radio receiver is to
   A allow the bulk of the gain and selectivity of the receiver to be achieved by circuits
     working at a narrow fixed frequency range.
   B simplify the process of demodulation because all signals are of a reasonably constant
     amplitude.
   C avoid the need for tuned circuits in the radio frequency stages by eliminating the
     possibility of image frequencies.
   D mix all incoming radio frequencies down to audio thereby avoiding the need for
     several different types of demodulator.
26 3K1, 3L1  The purpose of a frequency discriminator is to
A produce frequency modulation.
B demodulate frequency modulation.
C measure the frequency of an oscillator.
D select the wanted frequency in an FM receiver.

27 3M1, 3M2, 3M3  The (Fast) Fourier Transform
A takes analogue signals in the time domain and provides an output in the frequency domain.
B takes digital signals in the time domain and provides an output in the frequency domain.
C takes analogue signals in the frequency domain and provides an output in the time domain.
D takes digital signals in the frequency domain and provides an output in the time domain.

28 4A1, 4A2, 4A3, 4B1  A transmitter is producing 50W of RF at its output. This is fed to 30m of feeder which, at VHF, has a loss of about 1dB per 10m. How much power arrives at the antenna?
A 17W.
B 25W.
C 47W.
D 49W.

29 4C2, 4C3, 4C4, 4C5  The manufacturer of a vertical HF antenna has provided a polar diagram which shows it has an Angle of Radiation of about 20 degrees in free space. When mounted over real ground this angle is likely to
A hardly change.
B increase.
C decrease.
D reduce to zero.

30 4D1, 4D2  An HF dipole has traps fitted to enable it to operate on 14 and 21MHz. The trap should be
a
A series tuned circuit resonant at 14MHz.
B series tuned circuit resonant at 21MHz.
C parallel tuned circuit resonant at 14MHz.
D parallel tuned circuit resonant at 21MHz.

31 4E1, 4F1, 4G1, 4H1  A dummy load should be
A of 50Ω resistance, non-inductive and screened.
B of 50Ω reactance, coaxial construction and screened.
C of 50Ω reactance, balanced construction and screened.
D of 50Ω resistance, non-inductive and unscreened.
32  Electromagnetic waves have an electric field and a magnetic field
   A which are at right angles to each other and both are at right angles to the direction of
      propagation.
   B which are parallel to each other and at right angles to the direction of propagation.
   C which are at right angles to each other and the direction of propagation is parallel to
      the electric field.
   D which are at right angles to each other and the direction of propagation is parallel to
      the magnetic field.

33  Which of the following is lowest in height?
   A The G layer of the ionosphere.
   B The D layer of the ionosphere.
   C The F layer of the ionosphere.
   D The E layer of the ionosphere.

34  When operating a handheld on 70cm walking in a large city centre it is noticed that
    contact can sometimes be lost when in a more open part of the city and yet maintained on
    occasions when in tall narrow streets. A likely explanation is
    A multipath reflection off buildings giving almost random coverage and loss.
    B ionospheric fading due to random fluctuations in the ionosphere.
    C polarisation changes due to the portable use of a handheld radio.
    D sporadic-E contact during times of high atmospheric pressure.

35  Which one of the items listed below is most likely to be the source of interference to other
    domestic appliances?
    A A television.
    B A mobile phone.
    C A DVD player.
    D A video recorder.

36  An interfering continuous buzz on an HF receiver is present at all times of day and night.
    Which item of domestic equipment or facility is probably NOT a potential cause?
    A VDSL data on a telephone line.
    B A switched-mode power supply to a clock radio.
    C Mains powered remotely operated garage door opener.
    D Bi-metal thermostat on a central heating system.
37 6D1, 6D2, 6D3, 6D3
Voice signals from an amateur transmitter are being picked up on a CD player that has external speakers. You should fit
A a high pass filter in the transmitter feeder.
B a low pass filter in the transmitter feeder.
C a ferrite ring on the mains cable of the CD player.
D ferrite rings on all the leads of the CD player, including the external speaker leads.

38 6E1, 6E2, 6E3, 6F2, 6F3
What is the purpose of a separate earth in the radio shack?
A To provide a path to earth for any incidental RF currents produced by the transmitter.
B To minimise noise on the mains supply from affecting the receiver.
C Enhance the safety of operators and visitors to the station in the event of the mains earth failure.
D Provide an anti-static point for use in construction or repair.

39 7A3, 7A4, 7B1
Which of the following organisations is responsible for the bandplans?
A British Broadcasting Corporation (BBC).
B International Amateur Radio Union (IARU).
C Office of Communication (Ofcom).
D International Telecommunication Union (ITU).

40 7E1, 7F2, 7G1, 7G2, 7G3, 7G4
When using a computer soundcard and suitable software to operate on-air with one of the digital modes, as well as ensuring correct connections it is necessary to check
A the section of the band used by that mode in the licence schedule.
B the maximum power permitted for the proposed transmission mode.
C the possibility of warning sounds being generated by other software.
D the time-out limits for the proposed transmission mode.

41 8A1, 8A2, 8A4, 8A6, 8A8, 8E1
If adjustments to mains powered equipment must be made with the power switched on, it is advisable to
A use a directly earthed wrist strap.
B wear a residual current device (RCD).
C ensure the equipment is insulated from earth.
D only use one hand to make the adjustments.

42 8B2, 8B3, 8B4, 8B5, 8B6
Why might a manufacturer specify the use of a slow-blow fuse?
A To avoid an excessive current surge when the device is switched on.
B To ensure the fuse in the mains plug blows first to avoid surges in the equipment.
C Because the equipment concerned draws a heavier current when first switched on.
D Because the equipment needs to boot up before the supply is disconnected.
When drilling through metal sheeting you should always
A wear a tool belt.
B countersink the hole first.
C hold the sheeting in a vice or clamp.
D ensure that there is good ventilation.

To measure current in a series circuit, the multi-meter test probes should be connected
A in parallel with the relevant circuit.
B in parallel with the component under test with the battery disconnected.
C in series with the relevant components in the circuit.
D in series with the component under test with the battery disconnected.

The schedule to a local broadcast radio licence specifies an output power of 23dBW. What power is that in Watts?
A 20W.
B 23W.
C 200W.
D 230W.

A small surface mount capacitor is marked 272. What is its value?
A 272pF.
B 27pF 2% tolerance.
C 270pF.
D 2700pF.
## Answer key

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