

Amateur Radio Examination Intermediate Level

Candidate:
Candidate DoB:
Centre:
Exam Date:

This paper consists of 45 questions

Time Allowed: 1 hour 25 minutes.

<p>Candidate Declaration. I confirm that this is all my own work and that I have followed the rules of the examination. <i>I understand that breaches of the Examination rules may result in disqualification or other penalty and that breaches by the Examination Centre may invalidate the examination.</i></p>	<p>Candidate's signature.</p>
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INSTRUCTIONS TO CANDIDATES

You should have 3 items.

1. This Examination Paper
2. An Optical Mark Sheet
3. Reference Data for use in the Intermediate Level Examination

You will need a pen, an HB pencil and an eraser. You may use a silent, non-programmable calculator.

Check that your personal details on this Examination Paper and your Optical Mark Sheet are correct and sign both using your pen before the examination begins.

All questions have equal marks and all questions should be attempted.

Each question has 4 possible answers, identified 'A', 'B', 'C' and 'D'. Only one answer is correct, the others are wrong. You should decide which of the 4 answers is correct and mark the answer box for each question accordingly.

Your answers should initially be marked lightly in HB pencil on the Optical Mark Sheet. Errors should be corrected using your eraser.

If you decide answer 'C' is correct, show this by marking box 'C' using an HB pencil.	A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/>
If you change your mind before inking-in, rub out the mark and ink-in the box of your new choice	A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/>
To confirm your original answer ink-in the whole box.	A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>

When you are satisfied with your answer, shade in the whole box with **black ink**. Do **NOT** make any mark outside the box. **Once you have inked-in the Optical Mark Sheet, no changes can be made.**

The Reference Data booklet contains the Schedule to the licence, which may be used to help answer any question.

The Optical Mark Sheet is designed to be machine marked and will provide the result for this Examination. It must be completed during the time allowed for the Examination.

This paper, the Optical Mark Sheet and the Reference Data Booklet must be handed in at the end of the Examination.

Notice to candidates

You must not talk to or distract any other candidate in the exam room.

You are not allowed any assistance in answering exam questions and the Invigilator is not permitted to discuss examination questions. If you have a reader, the reader may read the questions to you but they cannot explain them.

If you need other assistance, please raise your hand and talk quietly to an Invigilator when approached.

If you wish to challenge an exam question please advise an Invigilator. They will not be able to help you answer the question, but will pass your challenge to the examination office.

You may not leave the exam room without permission and may not re-enter the room unless you have been escorted by an Invigilator at all times.

You must use black ink for your final answers.

Any calculations should be done on the Examination Paper
NOT the Optical Mark Sheet.

- 1 Which of the following call signs is that of a UK Intermediate Licence holder?
 - A M3ABC
 - B MM1ABC
 - C 2U0ABC
 - D G14ABC

- 2 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.

- 3 A temporary location is
 - A anywhere other than the Main Station Address
 - B an alternative fixed location without a postal address
 - C an alternative fixed location with a postal address
 - D any location when mobile.

- 4 An Intermediate Licence holder may operate
 - A outside the UK
 - B from an aircraft
 - C from a ship at sea
 - D through satellites.

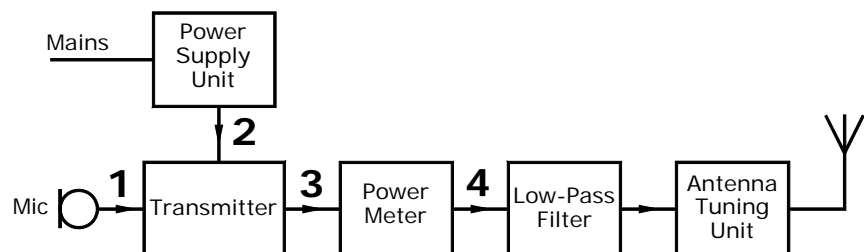
- 5 Which of the following types of operation is NOT covered by your Intermediate Licence?
 - A Beacon transmissions.
 - B Leaving your data transmitter running whilst out at work.
 - C Operation of a hidden transmitter intended for a direction finding contest.
 - D Allowing another licensed radio amateur to use your transmitter whilst you are out at work.

- 6 How often must an Intermediate Licence holder test his/her station to ensure it is not causing 'undue' interference?
 - A From time to time.
 - B Daily.
 - C Weekly.
 - D Monthly.

- 7 An amateur must confirm the details of his/her licence to Ofcom at least every
 - A two years
 - B three years
 - C four years
 - D five years.

- 8 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
- 9 On which of the following Intermediate Licence frequency allocations must users accept interference from Industrial, Scientific and Medical (ISM) users?
- A 14.000 – 14.350MHz
 - B 24.890 – 24.990MHz
 - C 24000 - 24150MHz
 - D 248000 – 250000MHz
- 10 A Primary cell is
- A rechargeable
 - B normally 13.8V
 - C a manual handling risk
 - D useless once discharged.
- 11 If three 10k Ω resistors are wired in series their combined value will be
- A 1k Ω
 - B 3.3k Ω
 - C 10k Ω
 - D 30k Ω
- 12 A capacitor could be described as
- A a number of turns of wire
 - B two metal discs separated by a thin layer of plastic
 - C a diode that can be used to set the frequency of a tuned circuit
 - D a semi-conductor.
- 13 Impedance is best described as opposition to energy transfer or storage in a circuit containing
- A a resistor
 - B a capacitor
 - C an inductor
 - D a resistor and either a capacitor or an inductor.
- 14 To change the resonant frequency of a tuned circuit you would need to change the
- A frequency of the oscillator
 - B value of the supply current
 - C value of the supply voltage
 - D value of the inductor or the capacitor.

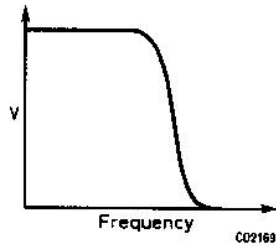
- 15 In a 24V mains power supply unit the rectifier diode is used to
- A smooth the DC pulses
 - B change the AC to pulses of DC
 - C reduce the 230V mains to 24V AC
 - D reduce the 230V mains to 24V DC.
- 16 In a correctly operating circuit, if a small base current flows in a transistor, the collector current should be
- A equal to the base current
 - B larger than the base current
 - C smaller than the base current
 - D opposite to the base current.
- 17 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.
- 18 In a modern transmitter the output of the balanced modulator is
- A a single sideband
 - B two sidebands
 - C frequency modulated
 - D two tones for data transmissions.
- 19 Audio and radio signals are mixed together to produce
- A sidebands
 - B harmonics
 - C oscillations
 - D spurious emissions.
- 20 At which point in the block diagram should the audio frequency bandwidth be limited to enable more efficient use of the radio frequency spectrum?



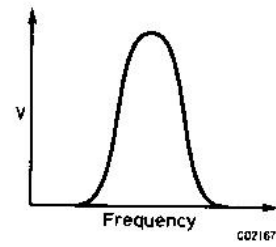
- A point 1
- B point 2
- C point 3
- D point 4

21 Which of the following responses would be produced by a high pass filter?

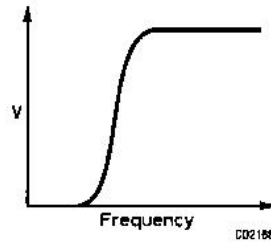
- A Response 1
- B Response 2
- C Response 3
- D Response 4



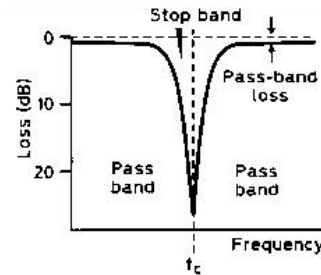
1



2



3



4

22 The output from the demodulator in a superheterodyne receiver will be at the

- A audio frequency
- B intermediate frequency
- C wanted radio frequency
- D local oscillator frequency

23 The wanted signals in a superheterodyne receiver are selected by tuned circuits in the

- A AF amplifier
- B IF amplifier
- C RF amplifier
- D RF and IF amplifiers.

24 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.

25 Coaxial feeder can be buried in damp ground and still work effectively because

- A the outer insulation acts as an RF screen
- B the damp earth absorbs unwanted radiation
- C The RF field is confined within the cable
- D the equal and opposite RF fields cancel each other out.

- 26** If you find that you have a high SWR reading, you can reduce it by
- A shortening the feeder length
 - B adjusting the ATU to match the feeder's input impedance to the transmitter
 - C tuning the transmitter's power amplifier to match the frequency in use
 - D adjusting the ATU to match the feeder's characteristic impedance to the transmitter.
- 27** If an Intermediate Licence holder feeds 16W of RF power into an antenna with a gain of 12dB the ERP in the direction of maximum radiation will be
- A 1W
 - B 28W
 - C 192W
 - D 256W
- 28** Which of the following is lowest in height?
- A The troposphere.
 - B The D layer of the ionosphere.
 - C The E layer of the ionosphere.
 - D The F layer of the ionosphere.
- 29** Snow, ice or heavy rain would reduce propagation mostly on
- A LF
 - B HF
 - C VHF
 - D UHF.
- 30** The wavelength of a signal at 14.230MHz is
(Take the velocity of light, c , as 3×10^8 m/s)
- A 21.1cm
 - B 47.4cm
 - C 21.1m
 - D 47.4m.
- 31** Transmitters for the amateur market built by good manufacturers may still cause interference because
- A the level of harmonics is not normally specified
 - B different countries have different requirements on their manufactures
 - C EMC regulations do not apply to amateur equipment
 - D the RF fields generated are greater than the limits specified in EMC regulations.
- 32** Faulty operation of a transmitter is suspected of causing radiation on closely adjacent frequencies; to check for this you should
- A replace the transmitting antenna with a dummy load
 - B tune a sensitive receiver to multiples of the transmitter frequency
 - C tune a de-sensitised receiver to either side of the transmitter frequency
 - D replace the mains power supply unit with a battery.

- 33** A digital television is suffering interference from a nearby radio transmission. A likely effect is that
- A the picture freezes or appears very jerky
 - B the picture colours are incorrect
 - C wavy lines appear across the picture
 - D bands of white and bright dots appear at regular intervals.
- 34** 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.
- 35** When investigating a complaint of breakthrough from your Station which of the following documents would be MOST useful?
- A your logbook
 - B your TV Licence
 - C the Ofcom Licence Document
 - D your current Validation Document.
- 36** What is the meaning of the code QRN?
- A Are you suffering from static noise?
 - B What is your location?
 - C Do you have my details?
 - D Who is calling me?
- 37** Which of the following types of HF transmission is LEAST likely to be affected by rapidly changing propagation conditions?
- A CW
 - B SSB
 - C FM
 - D SSTV.
- 38** When entering an amateur radio contest you will normally need to
- A operate from an unusual location
 - B exchange specified information correctly
 - C produce QSL cards confirming all contacts
 - D be a member of the relevant national society.

- 39** When using an amateur satellite to contact another country you must be able to receive:
- A the up-link frequency
 - B the down-link frequency
 - C both the up-link and down-link frequencies
 - D the satellite's beacon.
- 40** When soldering, good eye protection is needed because
- A the tip of the soldering iron is very hot
 - B the solder fumes are corrosive to eyes
 - C getting solder fumes in your eyes can cause asthma
 - D molten solder could be flicked into the eyes causing blindness.
- 41** 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.
- 42** If you are fixing a new antenna to your property you should
- A only use a metal ladder
 - B ensure that you are alone on the site
 - C set the ladder at an angle of 4 up to 1 out
 - D ensure that the ladder is placed well away from the antenna.
- 43** A fuse is used to
- A produce inductance in a mains lead
 - B remove the mains supply in the event of too much current flowing
 - C remove the mains current if there is a very small current to earth
 - D protect against PME.
- 44** 'Tinning' can be described as
- A scraping the bare wire to make it shine
 - B enclosing a tuned circuit with a tin shield
 - C ringing in the ears caused by listening to the radio at high volume
 - D coating a surface with solder before making the joint.
- 45** A resistor with the coloured bands brown, black, black, silver would have a value close to
- A 0.1Ω
 - B 1Ω
 - C 10Ω
 - D 100Ω

Answer key

1	2	3	4	5	6	7	8	9
C	D	B	D	D	A	D	B	C
10	11	12	13	14	15	16	17	18
D	D	B	D	D	B	B	C	B
19	20	21	22	23	24	25	26	27
A	A	C	A	D	B	C	B	D
28	29	30	31	32	33	34	35	36
A	D	C	D	C	A	D	A	A
37	38	39	40	41	42	43	44	45
A	B	C	D	C	C	B	D	C