Advanced Mock Exam
By Steve Hartley G0FUW

Licence Conditions

1 What Callsign **must** be used by GM4ZZZ when the Station is operating from a vessel on the Leeds to Liverpool canal:

a. G4ZZZ
b. GM4ZZZ
c. GM4ZZZ/M
d. G4ZZZ/MM

2. A UK Licence holder may use their Radio Equipment to assist with communications in times of:

a. Disasters
b. National emergency
c. International emergency
d. Disasters or national or international emergency

3. A Recognised Training Course means any training course that:

a. is organised by a registered RSGB instructor
b. is registered with the Radio Society of Great Britain
c. will lead to successful students being issued with any recognised UK amateur radio qualification
d. will lead to successful students being issued with an examination pass certificate that is recognised by Ofcom for the issue of a Foundation Licence

4 Which of the following locations would NOT be classed as being 'at sea'?:

a. on a sailboard launched from the beach at Weston Super Mare
b. on the Queen Mary cruising across the Atlantic Ocean
c. on a boat on the non-tidal part of the river Thames
d. on a yacht sailing around the Isle of Wight

5 If you are operating in another CEPT country, which of the following Licence conditions apply?:

a. Those of the host country
b. Those of the IARU Region you are in
c. Those set out in the UK Full Licence Schedule
d. Those that are contained in the CEPT Licence Schedule

6 Which of the following specifically make it offence to send Messages that are grossly offensive or of an indecent, obscene or menacing nature?:

a. Civil Contingencies Act 2004
b. The Wireless telegraphy Act 2006
c. CEPT Recommendation T/R 61-01
d. The Wireless Telegraphy (Content of Transmission) Regulations 1988

7 In order to carry out the Unattended Operation of a beacon, the Licence holder must:

a. obtain permission from the RSGB
b. remain within the terms of his Licence
c. inform the Operations Manager at the local office of Ofcom
d. obtain a Notice of Variation (NoV) from the Radio Licensing Centre

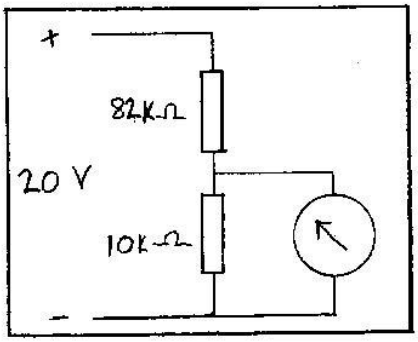
8 In addition to identifying the station during initial CQ calls, you should send your callsign:

a. by the same type of transmission that is being used for the communication
b. at least once every 15 minutes during a long contact
c. at the beginning of transmission on a new frequency
d. all of the above

9 Whatever class of emission you are using you must ensure that:
a. The apparatus is totally free from unwanted emissions
b. The bandwidth is such that not more than 1% of the mean power falls outside the frequency band in use
c. The Station is designed and constructed so that its use does not cause any interference
d. The Station is capable of receiving messages of all classes of emission

10 On which frequency would 400W exceed the maximum permitted power level?
a. 1.825MHz
b. 10.125MHz
c. 51.125MHz
d. 433.125MHz

Technical Aspects

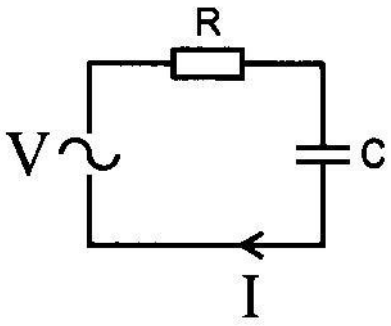


11 In the potential divider shown above, the potential difference across the 10k would be:
a. 2V
b. 10V
c. 20V
d. 82V

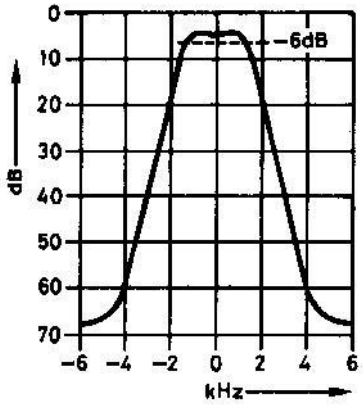
12: Which of the following would decrease the overall capacitance:
a. Increasing the surface area of the plates
b. Increasing the separation of the plates
c. Changing the dielectric to one with a higher K value
d. Adding another capacitor in parallel

13: If a 5mH inductor is connected in series with a 500μH inductor the total value will be:
a. 2.2mH
b. 0.202mH
c. 5.5mH
d. 500.5μH

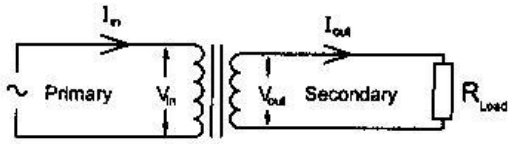
14: If the time for one complete cycle of a sine wave is 0.0001ms, what is its frequency?
a. 10Hz
b. 10kHz
c. 10MHz
d. 100MHz



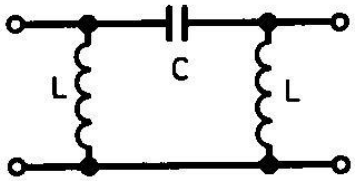
15: In the circuit shown above, if R = 150Ω and C = 180pF, what impedance would be seen by a 10MHz voltage source?
a. 155Ω
b. 174Ω
c. 182Ω
d. 333Ω



16: If the centre frequency of the filter that produced the response curve shown above is 10.7MHz, what is the Q of the filter?
a. 1.6^{-3}
b. 3.2^{-6}
c. 3057
d. 6114



17: The primary winding of the transformer in the figure above has 80 turns and the secondary has 40 turns. If the input impedance is 250Ω, what is the impedance across the secondary terminals?:
a. 62.5Ω
b. 125Ω
c. 176Ω
d. 500Ω

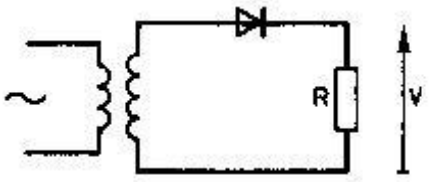


18: The circuit shown above is:
a. a low pass filter
b. a high pass filter
c. a band pass filter
d. a band stop filter

19: A best way of preventing thermal drift in a VFO is:
a. to allow the radio to warm up before use
b. to keep the shack heated at all times
c. to ensure all oscillator components have a positive temperature coefficient
d. to design circuits with a balance of components with positive and negative temperature co-efficients

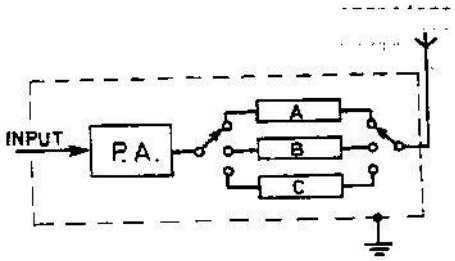
20. When a bi-polar transistor is conductive, the emitter-base junction is:
a. reverse biased
b. open circuit
c. short circuit
d. forward biased

21. The input resistance of a common-emitter amplifier stage is about:
a. 5Ω
b. 50Ω
c. 1kΩ
d. 200kΩ



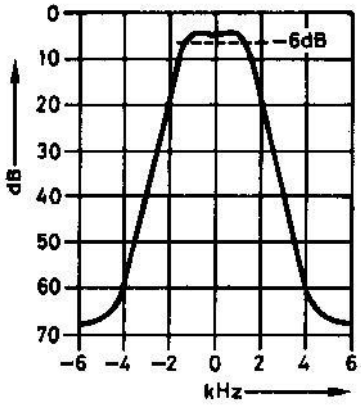
22. The circuit shown above is for:
a. half-wave rectification
b. full-wave rectification
c. reverse bias protection
d. voltage multiplication

Transmitters



23. In the block diagram of an HF multi-band transmitter above, what are in the boxes marked A, B and C?
a. low-pass filters
b. power amplifiers
c. mixer tuned circuits
d. band specific crystal oscillators

24. A 145MHz FM transmitter uses a x12 multiplier and a deviation of 5kHz. The oscillator deviation will be:
a. 0kHz
b. 0.417kHz
c. 5kHz
d. 60kHz



25. The diagram above represents the response of a filter. It would be most suitable in a receiver for:
a. wide-band FM signals
b. AM signals
c. fast-scan TV signals
d. SSB signals

26. Over-driving a power amplifier will:
a. give a high SWR reading
b. give minimum distortion on receive
c. generate excessive harmonics
d. maximise the power output

27. Chirp is a form of frequency instability. It is caused by:
a. birdies in the receiver
b. over-modulation
c. over-deviation
d. pulling of an oscillator when keying

28. Which of the following would be used to minimise the radiation of a specific harmonic?:
a. A trap in the transmitter output
b. A push-pull amplifier stage
c. A high-pass filter in the transmitter output
d. A filter in the receiver down-lead

29. An external power amplifier should be driven:
a. To the full duty cycle
b. To only half the duty cycle
c. By the maximum transmitter output for maximum amplifier output
d. By the minimum transmitter output for maximum amplifier output

Receivers

30. Which of the following terms relates to a receiver's ability to resolve one signal whilst rejecting other signals near to the same frequency?:
a. selectivity
b. dynamic range
c. signal to noise ratio
d. second channel rejection

31. In a superheterodyne receiver there is some circuitry between the first mixer and the IF filter. This circuitry is likely to be an:
a. IF amplifier
b. RF amplifier
c. AF amplifier
d. AGC amplifier

32. The function of an IF amplifier is to:
a. convert the wanted signals from the antenna to a higher frequency
b. convert the wanted signals from the antenna to a lower frequency
c. select and amplify the wanted signals from the demodulator/detector
d. select and amplify the wanted signals from the RF mixer

33. In a double conversion superheterodyne receiver the frequency difference between the wanted RF signal and the so-called 'image frequency' is:
a. twice the wanted RF
b. twice the first IF
c. twice the second IF
d. the sum of the first and second IF's

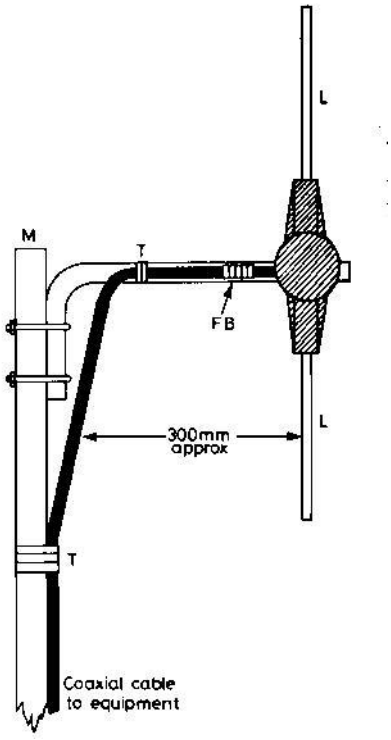
34. The effect of the AGC on receipt of a very strong signal is to reduce:
a. the VFO output
b. the gain of the RF and IF amplifiers
c. the power supply voltage
d. the frequency of the RF amplifier

35. In order to receive amateur signals on 433MHz using a 28MHz receiver a down-converter must be used. The frequency of the oscillator in the converter will need to be set to:
a. 28MHz
b. 433MHz
c. 461MHz
d. 489MHz

Feeders and Antennas

36. A half-wavelength of 50Ω feeder is terminated by a load of 68Ω. The input to the feeder will be:
a. 34Ω
b. 50Ω
c. 68Ω
d. 132Ω

37. Which of the following represents the correction factor normally used in calculating the length of a wire dipole?:
a. 66%
b. 75%
c. 80%
d. 95%



38. The 433MHz antenna shown in the diagram above is:
a. a dipole
b. a 1/4λ vertical
c. a yagi
d. a quad

39. A correctly tuned antenna with an SWR of 1:1 at the transmitter will have:
a. no return loss
b. a return loss of 1
c. a low return loss
d. a high return loss

40. A device used to tune out reactance at the feedpoint of the antenna systems is known as:
a. Antenna reactance analyser
b. Antenna matching unit
c. Return loss bridge
d. SWR meter

Propagation

41. Which of the following reduces by the inverse square of the distance from the antenna?:
a. SWR
b. Field Strength
c. Power Flux Density
d. Angle of radiation

42. Which of the following ionospheric layers is found below a height of 100km?:
a. D
b. E
c. F1
d. F2

43. Which of the following bands would give best chance of propagation between UK and USA during a winter's day?
a. 3.5MHz
b. 7MHz
c. 21MHz
d. 50MHz

EMC

44. Colour loss on a TV picture is most likely to be caused by breakthrough from:
a. 3.5MHz
b. 50MHz
c. 144MHz
d. 433MHz

45. The main cause of intermodulation products in a receiver is:
a. the receiver being tuned off channel
b. a crystal filter being used
c. non-linearity in the RF stages
d. a good pre-selector being used

46. A corroded connector on a neighbour's TV receiving antenna may cause:
a. unwanted mixing products due to it exhibiting diode properties
b. rectification of the mains supply
c. general reception of foreign TV stations
d. increased amplification of the wanted signal

47. The main action of a mains filter is to act as a:
a. band-pass filter with a centre frequency of 50Hz
b. high-pass filter with a cut-off frequency a little above 50Hz
c. high impedance to common mode currents
d. high impedance for differential mode currents

48. Which one of the following filters should be used in order to attenuate 145MHz signals on a TV downlead?:
a. low-pass filter
b. high-pass filter
c. band-stop filter at the TV frequency
d. band-pass filter at 145MHz

49. If you are radiating 1kW ERP from an antenna located 20m away, what field strength would you be subjected to?:
a. 11V/m
b. 350V/m
c. 1000V/m
d. 2857V/m

50. Which of the following antennas is likely to produce LEAST EMC problems:
a. a 50Ω dipole with 50Ω coaxial feed
b. a 50Ω vertical with 50Ω feed
c. a balanced dipole with balanced feeder
d. an end-fed wire connected direct to an antenna matching unit with a low resistance RF earth fitted

51. If interference is caused to a government wireless station there may be a verbal demand to close down your station. This will be followed initially by:
a. confirmation in writing
b. a visit from the police
c. confiscation of equipment
d. licence restrictions

Operating Practices

52. Which of the following is NOT a normal means of using Packet Radio?:
a. connecting two stations via the internet
b. connecting two stations via wireless telegraphy
c. connecting two stations via a third station acting as a repeater
d. one station picking up messages from another station via a third station acting as a mailbox

53. When operating through a VHF or UHF voice repeater you should not transmit until the repeater has transmitted its:
a. callsign
b. reset tone
c. CTCSS code
d. time out signal

54. You are operating in a VHF contest and are suffering severe co-channel interference from another station close by. This may be due to poor quality transmissions or poor receiver performance. To check which you should:
a. ask the other station to close down for a while
b. add a pre-amp to your receiver antenna socket
c. ask the other station to turn their beam 90^0 away from you and check for interference again
d. turn your beam away from the other station and move further up the band

55. Bandplans are produced by:
a. Radio Society of Great Britain (RSGB)
b. International Amateur Radio Union (IARU)
c. Office of Communication (OfCom)
d. International Telecommunication Union (ITU)

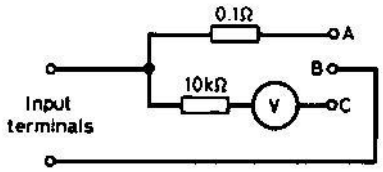
Safety

56. When wearing headphones it is NOT safe to:
a. be calling CQ
b. be switching off
c. have one's hands inside the equipment
d. have rubber gloves on

57. Long flexible antennas are unsafe for use on a moving vehicle because:
a. they can scratch the vehicle's paintwork
b. they can bend over and strike pedestrians
c. they increase the RF fields inside the car when the antenna bends
d. if they touch the vehicle body a heavy DC current will flow, overheating the feeder and posing a risk of fire

58. In order to protect your station from damage by near-by electrical storms you should:
a. earth your antenna system
b. bond all metal surfaces to earth
c. unplug the transceiver from the mains supply unit
d. fit an earthed static discharge device in the antenna feeder

Measurements



59. In the circuit shown above, which connections should be made to allow the meter to act as a voltmeter?
a. A to B
b. A to C
c. B to C
d. A to B to C

60. A digital frequency meter can be used to measure transmission:
a. harmonic content
b. sideband content
c. frequency deviation
d. frequency accuracy

61. A cathode ray oscilloscope is able to display:
a. DC voltages
b. sine waveforms
c. square waveforms
d. all of the above

62. The ‘two-tone’ test is used to measure:
a. SWR
b. SSB output power
c. frequency deviation
d. second channel interference

NOW GO BACK AND CHECK YOUR WORK!

Advanced Mock Exam Answers:

Question	Answer	Book Page
1	A	8 & Licence
2	D	8 & Licence
3	D	6 & Licence
4	C	7 & Licence
5	A	7 & Licence
6	D	8-9 & Licence
7	B	9 & Licence
8	D	10 & Licence
9	B	10 &Licence
10	C	Schedule
11	A	23-24 (Calc)
12	B	24-25 (Calc)
13	C	26-27 (Calc)
14	C	27 (Calc)
15	B	29 (Calc)
16	C	31-32 (Calc)
17	A	32 (Calc)
18	B	92
19	D	33
20	D	36-37
21	C	39
22	A	35
23	A	44 & 54
24	B	49
25	D	61
26	C	60
27	D	56-57
28	A	91-92
29	D	60
30	A	61
31	A	62 (Fig)

Question	Answer	Book Page
32	D	65
33	B	63
34	B	66-67
35	C	70
36	C	72 (Calc)
37	D	73-74
38	A	74
39	D	73
40	B	78-79
41	C	80
42	A	82 (Fig)
43	C	81 (Table)
44	A	88 – fig12.10 & 90
45	C	89
46	A	90
47	C	92-93
48	B	92
49	A	86 (Calc)
50	C	87-88
51	A	95 & Licence
52	A	11
53	B	12
54	C	13
55	B	13
56	C	14
57	B	15-16
58	D	16
59	C	96
60	D	101
61	D	100
62	B	98-99