

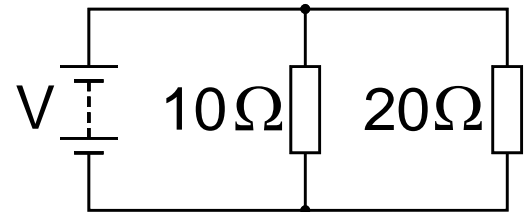
## Syllabus 2019 – Mock Examination Paper

### Intermediate Mock Paper 1

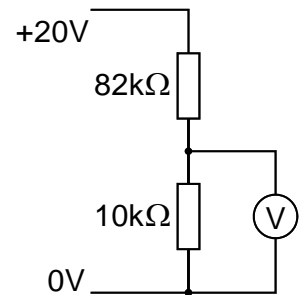
- 1**  
1A4, 1B1,  
1B2
- Revocation of an amateur licence is likely to occur if
- A the annual fee is not paid.
  - B the amateur's details are not updated at least once per year.
  - C the amateur's details are not updated at least once every five years.
  - D no transmissions have been made in a two year period.
- 2**  
1C1, 1C2,  
1C3
- 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.
- 3**  
1D1, 1D2
- If an amateur radio station is causing any undue interference to other wireless telegraphy, the emissions shall be suppressed or reduced, to the satisfaction of the
- A the person complaining.
  - B the Radio Society of Great Britain.
  - C the Local Authority.
  - D Office of Communications..
- 4**  
1E1, 1E2
- In order to operate an unattended beacon for a direction finding competition the operator must hold
- A at least an Intermediate licence.
  - B only a Full licence.
  - C any UK amateur licence.
  - D a permit for unattended operation.
- 5**  
1F1
- In order to operate in another European country an Intermediate licensee must
- A operate under the authority and limitations of the CEPT agreement.
  - B obtain personal permission from the authorities of that country.
  - C notify the host country of the intention to operate one month in advance.
  - D produce his or her transmitter for inspection immediately on arrival.

- 6** The Intermediate Licence permits a maximum RF output power at 136kHz of  
 1G1, 1G2
- A 1W erp
  - B 32W
  - C 40W erp
  - D 50W

- 7** If the current through the 10Ω resistor is 2A,  
 the current through the 20Ω resistor will be  
 2A1, 2C1
- A 1A
  - B 2A
  - C 3A
  - D 20A



- 8** In the potential divider shown, the potential difference across the  
 10kΩ resistor is about  
 2C2, 2C3
- A 2V
  - B 10V
  - C 20V
  - D 82V



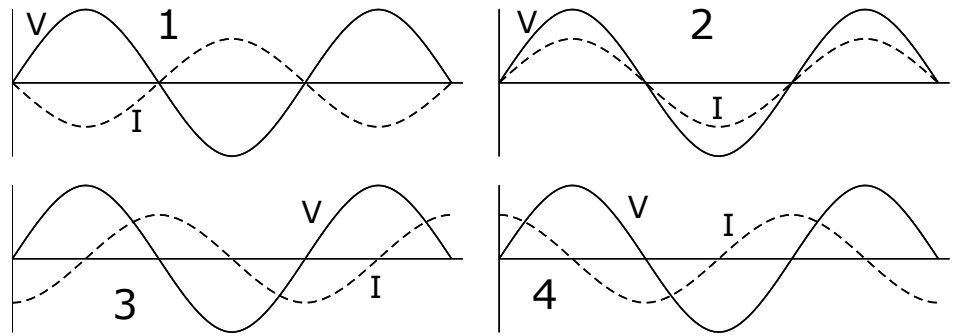
- 9** A capacitor could be described as  
 2D1, 2D2, 2D3
- A a number of turns of wire.
  - B two metal discs separated by a thin layer of plastic.
  - C two plastic discs separated by a thin metal disc.
  - D a semi-conductor.

- 10** Which factor below will have the greatest effect on the inductance of a coil?  
 2D4, 2D5, 2D6
- A Inserting a glass rod inside the coil.
  - B Decreasing the current through the coil.
  - C Increasing the diameter of the coil.
  - D Reducing the thickness of the insulation.

11  
2E1, 2E2,  
2E3

Which drawing correctly shows the phase relationship between the voltage and current in a resistor?

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



Note: In exam papers the order of the drawing options is randomised.

12  
2E4, 2E5,  
2E6

An inductor can store

- A henries in an alternating field  
B energy in a magnetic field  
C charge in an electric field  
D amps in a changing field.

13  
2E7, 2E8

An RF signal at 1MHz is present on a long twin wire feeder. At a particular point on the feeder a suitable probe shows the instantaneous current is from left to right. Where, if anywhere, is the direction of the current from right to left at exactly the same time?

- A At a point 150m down the feeder.  
B At a point 300m down the feeder.  
C At all other points down the feeder.  
D At no other points down the feeder.

14  
2F1

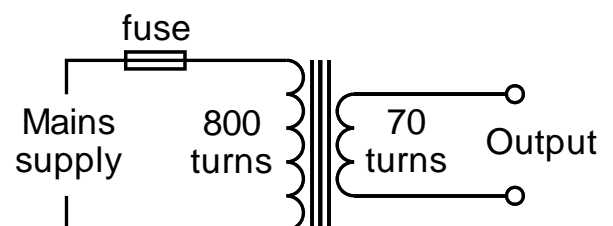
To capture all the information in a voice signal occupying the frequency band 300Hz to 3kHz the signal the lowest sample rate is just over

- A 300 times a second  
B 600 times a second  
C 3000 times a second  
D 6000 times a second

15  
2G1

The drawing shows a transformer with the primary connected to the mains supply. The output from the transformer will be

- A AC of the same voltage as on the primary.  
B AC of a higher voltage than on the primary.  
C AC of a lower voltage than on the primary.  
D DC if it is a lower voltage than on the primary.

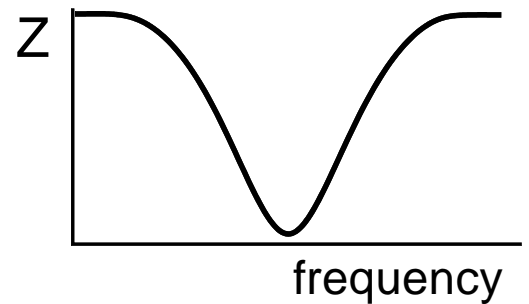


16

2H1, 2H2,  
2H3, 2H4,  
2H5

The graph shows how the impedance of a circuit changes as the frequency changes. The circuit is

- A a resistor and capacitor in series.
- B a resistor and capacitor in parallel.
- C an inductor and capacitor in series.
- D an inductor and capacitor in parallel.



17

2I1, 2I2, 2I3

In a correctly operating circuit, if a small base current flows in a transistor, the collector current should be

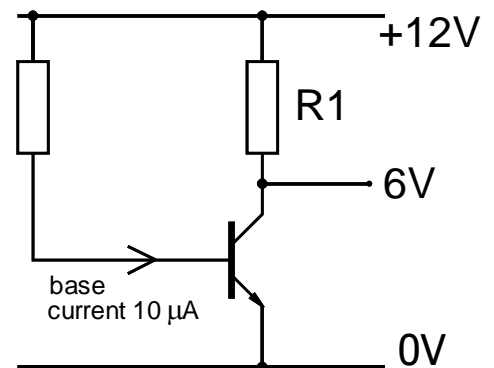
- A equal to the base current
- B larger than the base current
- C smaller than the base current
- D opposite to the base current.

18

2I4, 2I5, 2I6

The transistor in the diagram has a current gain  $\beta$  of 200 and a base current of  $10\mu\text{A}$ . What should be the resistance of R1 to achieve a voltage of 6 V at the collector?

- A  $2\text{k}\Omega$
- B  $3\text{k}\Omega$
- C  $20\text{k}\Omega$
- D  $30\text{k}\Omega$

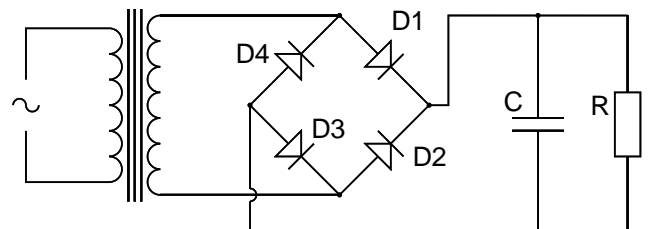


19

2J1, 2J2,  
2J3

The rectifier circuit shown is best known as a

- A double wave rectifier
- B half wave rectifier
- C single wave rectifier
- D bridge rectifier



20

2I7, 2J4

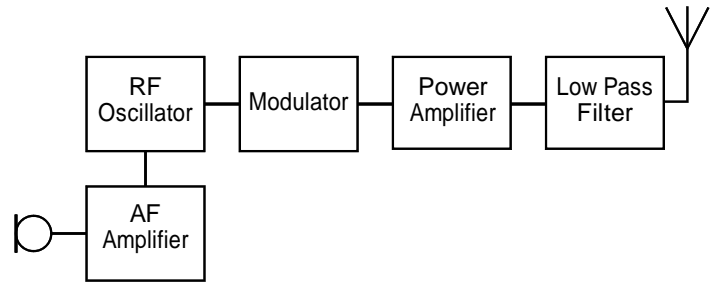
A linear power supply

- A has greater power efficiency than a switched mode power supply.
- B generates less RF Interference than a switched mode power supply.
- C produces a more stable voltage output than a switched mode power supply.
- D is lighter than a switched mode power supply.

**21** The transmitter shown in the diagram is likely to be

3A2, 3A3,  
3B1, 3C1,  
3C2, 3C3

- A a CW transmitter.
- B an SSB transmitter.
- C a FM transmitter.
- D an AM transmitter.



**22** A balanced modulator will produce

3E1, 3E2,  
3E3, 3F1

- A amplitude modulation with suppressed carrier
- B amplitude modulation with full carrier
- C single sideband modulation
- D frequency modulation.

**23** The power supply voltage of a home-made transmitter is seen to drop a little when on transmit. Unless suitable precautions are taken there is a risk of

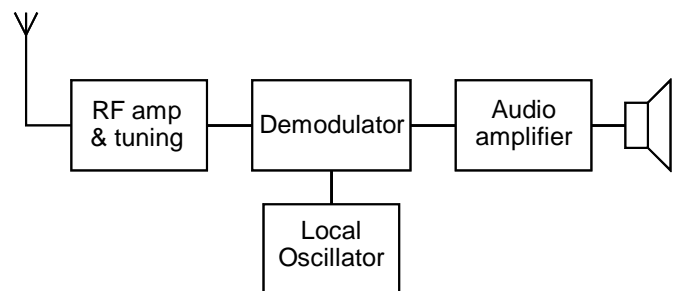
3G2, 3G3,  
3G4, 3G5

- A key clicks
- B over-modulation
- C chirp
- D harmonic distortion.

**24** The architecture of the receiver shown is commonly called

3H2, 3H3,  
3H4

- A a superhet receiver.
- B a direct conversion receiver.
- C a tuned radio frequency receiver.
- D an upper sideband receiver.



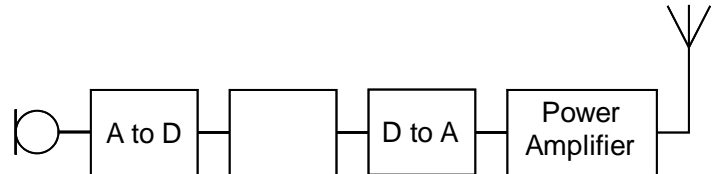
**25** The intermediate frequency of a radio receiver is 600kHz. The local oscillator is running at 12MHz. The frequency of the signal received will be

3I1, 3I2, 3I3

- A 600kHz
- B 11.4MHz
- C 12MHz
- D 12.4MHz

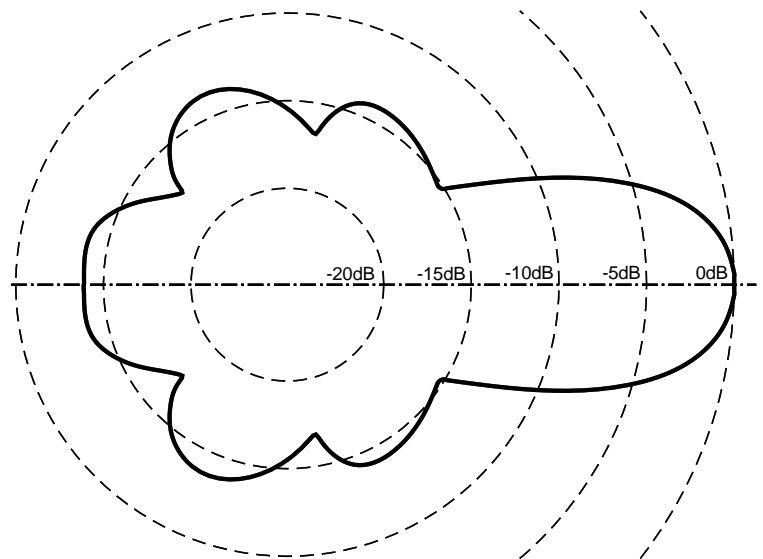
- 26**  
3K1, 3L1
- A product detector is used to
- A indicate the received signal strength
  - B produce an amplitude modulated signal
  - C demodulate an FM transmission
  - D demodulate an SSB transmission.

- 27**  
3M1, 3M2, 3M3
- In the SDR transmitter diagram the blank box is
- A a digital processor.
  - B a local oscillator.
  - C a balanced modulator.
  - D an audio amplifier.



- 28**  
4A1, 4A2, 4A3, 4B1
- In a coaxial cable the electrical and magnetic field
- A round one conductor is the same as the field round the other
  - B round one conductor is equal and opposite to the field round the other
  - C exists only between the two conductors and stays inside the cable
  - D is present round the cable for a distance of about 10 wavelengths.

- 29**  
4C2, 4C3, 4C4, 4C5
- The front to back ratio of the antenna with the polar diagram shown is about
- A 0dB
  - B 13dB
  - C 15dB
  - D 17dB

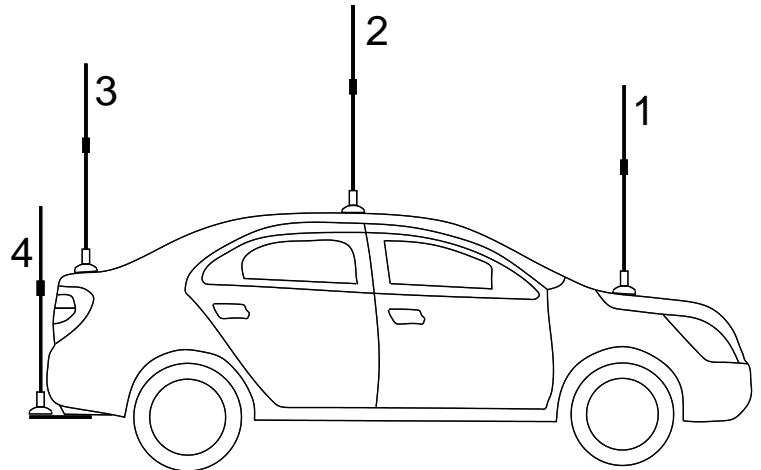


- 30**  
4D1, 4D2
- An antenna has a driven element and a reflector. There is probably also a
- A director
  - B radial
  - C matching coil
  - D ground plane.

- 31**  
4E1, 4F1,  
4G1, 4H1
- Adjusting the antenna matching unit located at the transmitter will
- A have no effect on the SWR on the feeder.
  - B reduce the SWR on the feeder.
  - C increases the SWR on the feeder.
  - D reduce the signal reflected at the antenna.
- 32**  
5A2, 5A3,  
5A4
- Ground wave propagation is mainly limited by
- A the curvature of the Earth
  - B absorption in the D-layer
  - C ionospheric refraction
  - D losses in the soil and earth.
- 33**  
5B1, 5B2,  
5B3
- An amateur has been recording the changes in HF propagation over several years. As well as changes summer to winter, it is noticed there is a progressive change from one summer (or winter) to the next. This is probably due to
- A global warming
  - B changes in the sunspot cycle
  - C reductions in the ozone layer
  - D an increase in transmitter power.
- 34**  
5B4, 5B5,  
5C3
- A situation can occur on an ionospheric contact where the LUF is higher than the MUF. This means that
- A no communication is possible on any band.
  - B a lower frequency band is likely to work better.
  - C a higher frequency band is likely to work better.
  - D all HF bands are open to allow communication.
- 35**  
6A1, 6A2,  
6A3, 6A4
- 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 manufacturers.
  - C EMC regulations do not apply to amateur equipment.
  - D the RF fields generated are greater than the limits specified in EMC regulations.
- 36**  
6B1, 6B2,  
6C1, 6C2
- A digital television receiver is suffering from interference from a nearby amateur FM transmission. The screen is likely to
- A show a wavy herringbone effect over the picture.
  - B have lots of white spots in a band across the screen.
  - C change colour markedly.
  - D freeze or break up into small squares.

- 37** A transmitter can best be checked for harmonics and spurious signals by using  
 6D1, 6D2, 6D3, 6D4
- A a general coverage radio receiver.
  - B a sensitive power meter.
  - C an absorption wavemeter.
  - D a frequency counter.

- 38** Which is the best location for a mobile antenna to minimise the RF field strength inside the metal bodied car?  
 6E1, 6E2, 6E3, 6F2, 6F3
- A Location 1
  - B Location 2
  - C Location 3
  - D Location 4



- 39** When calling CQ a reply is received from an amateur giving the call VK3ABC. The amateur is located in  
 7A3, 7A4, 7B1
- A France
  - B Canada
  - C the Netherlands
  - D Australia.

- 40** One feature of all amateur satellite communication is that  
 7E1, 7F2, 7G1, 7G2, 7G3, 7G4
- A transmit and receive are normally 600kHz apart in frequency
  - B the received frequency appears to drift quite widely
  - C contact is available 24 hours a day
  - D a sub-audible tone (CTCSS) is needed to maintain contact.

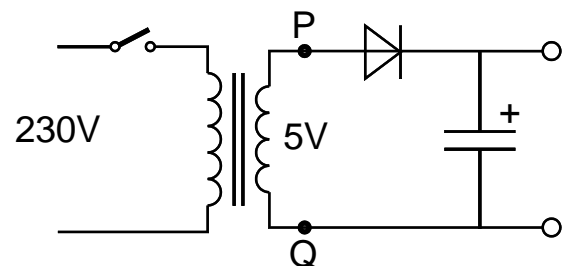
- 41** You propose to make an adjustment inside a valve power amplifier. Prior to working you should  
 8A1, 8A6
- A remove the transmitting valve to prevent breakage.
  - B disconnect the associated driver transmitter.
  - C disconnect the feeder from the amplifier.
  - D ensure the smoothing capacitor is discharged.



- 42** A table lamp is rated at 60W. A suitable fuse in its mains plug would be  
 8A2, 8A4, 8A8  
 A 13A  
 B 7A  
 C 5A  
 D 3A

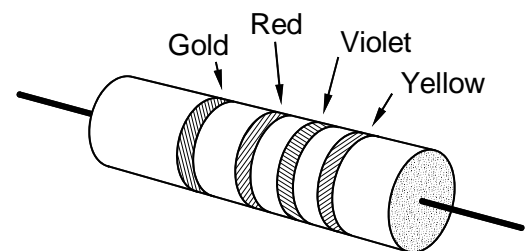
- 43** The best reason for using hand tools in the way they were intended is to  
 8B2, 8B3, 8B4, 8B5, 8B6  
 A reduce the chance of injury.  
 B prolong the life of the tool.  
 C reduce the amount of swarf or dust created.  
 D speed up the work.

- 44** A multimeter to measure the voltage across points PQ in the diagram should be set to  
 9A1, 9A2, 9A3, 9A5  
 A 0-10V DC  
 B 0-10A DC  
 C 0-10V AC  
 D 0-10A AC



- 45** An RF power amplifier is rated at 100W output and a gain of 16dB. For full output power without distortion, the input should be  
 9B1  
 A 2.5W  
 B 5W  
 C 10W  
 D 16W

- 46** What value COULD this resistor have?  
 9C1, 9D1, 9E1, 9E2, 9E3, 9E4  
 A 472Ω  
 B 4770Ω  
 C 27000Ω  
 D 272kΩ



### Answer key

1	2	3	4	5	6	7	8
C	A	D	A	B	A	A	A
9	10	11	12	13	14	15	16
B	C	B	B	A	D	C	C
17	18	19	20	21	22	23	24
B	B	D	B	C	A	C	B
25	26	27	28	29	30	31	32
B	D	A	C	B	A	A	D
33	34	35	36	37	38	39	40
B	A	D	D	A	B	D	B
41	42	43	44	45	46		
D	D	A	C	A	B		

### Intermediate Mock paper 1