UK Full Licence Mock Exam – 1 – Dated 01/10/2020

Compiled by Billy GM6DX

These questions are designed to represent a question style that you may get in the exam AND/OR designed to ensure a specific learning point is covered.

Q1. Which of the following is a UK Full licence call sign?

A. 2M1ABC/P
B. M3ABC/A
C. M5RRF/M
D. M6YUY/M

Q2. Which of the following does not meet the criteria for a disqualified person, in terms of your licence?

A. A person whose United Kingdom Amateur Radio Licence is currently revoked or varied as a result of revocation action.
B. A person whose last application for a United Kingdom Amateur Radio Licence was refused as a result of revocation action.
C. A person who, in the last six months, has been convicted of an offence under the Wireless Telegraphy Acts.
D. A person who has an overseas conviction, within the last six months, equivalent to the United Kingdom wireless Telegraphy Act offences.

Q3. You may send encrypted messages

A. only when using morse code.
B. on behalf of the coast guard.
C. on behalf of St John's ambulance service during an exercise.
D. on behalf of the RSGB regional manager during times of international disaster.

Q4. As part of your licence conditions you are required to ensure you do not cause interface to other radio users. In order to manage that, which of the following is not a licence requirement?

A. The Licensee shall ensure that the Radio Equipment is capable of receiving Messages on the same frequencies and mode as that being transmitted.
B. The Licensee shall conduct tests from time to time.
C. The Licensee shall ensure that the Radio Equipment is designed, constructed, maintained and used not to cause interference.
D. The Licensee shall conduct tests at least on one occasion over a rolling 6 month period to ensure that the requirements set out in this Clause are met.

Q5. In relation to the install and use of a remote control operational link which of the following is not a requirement?

A. The frequencies used in the link must be above the 30MHz range.
B. The frequency link must not be encrypted.
C. The link must not be for unsupervised use by other amateurs.
D. The link must have a failsafe to prevent unintended transmissions.

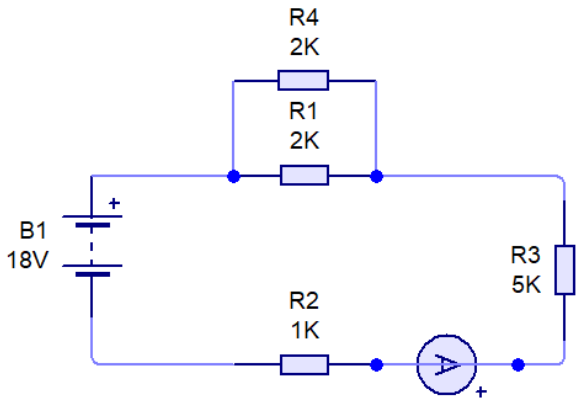
Q6. You are G3ABC and intend in operating maritime mobile as defined within the terms of your licence. Before or during the operation you

A. Must simply abide by the licence conditions and frequency schedule of your UK licence no matter where you are in the world.
B. Must obtain permission from the vessels master in writing.
C. Must follow the frequencies as defined within the 3 regions, set out by the I.A.R.U.
D. Must sign with the suffix of /MM

Q7. At the frequency of 2425MHz the status of allocation in UK to the Amateur Service is?

A. Secondary. Available on the basis of non-interference to other services inside or outside the UK
B. Not allocated
C. Secondary. Users must accept interference from Industrial, Scientific and Medical users.
D. Primary

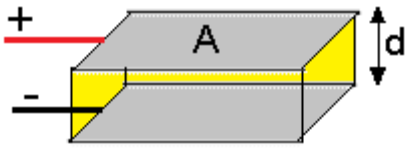
Q8.



What will the Ammeter reading show?

A. 3A
B. 2.25mA
C. 1.8mA
D. 0A

Q9.



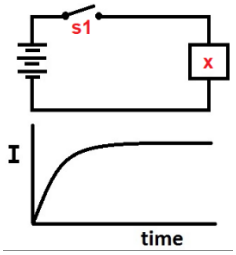
The above is a working diagram of a capacitor, which of the following is unlikely to influence the capacitance value?

A. The area size of the plates (A).
B. The voltage applied to the capacitor.
C. The distance (d) between the two plates.
D. The permittivity of the dielectric material.

Q10. Back EMF is created when a current changes, which is due to

A. the increase in voltage as current charges a capacitor.
B. voltage across a reverse biased diode in a half wave circuit.
C. the inductance in a coil of wire carrying the current.
D. The increase in voltage as a secondary cell is charged.

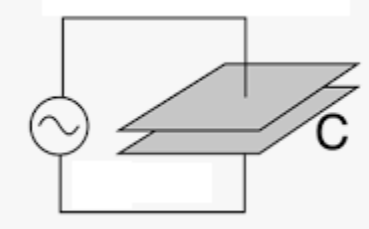
Q11.



Looking at the graph and circuit above, when switch 1 is closed the current rises and steady's out as per the above graph. Given this information which of the following would be in point X to give these results?

A. Capacitor in parallel.
B. Capacitor in series.
C. Inductor in series.
D. Inductor in parallel

Q12.



This capacitor has a value of 14nF and is supplied with an AC voltage of 70V at a rate of 800Hz. What is the reactance value?

A. 14.2K ohm
B. 142.21K ohm
C. 14.2M ohm
D. 142.21M ohm

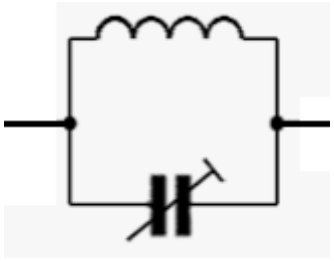
Q13. When converting analogue to digital signals on occasions a false image of the signal can be generated these are known as

A. Aliases.
B. Nyquist harmonics.
C. Anti-alias signals.
D. 2nd form of Nyquist rate.

Q14. You have a transformer which has 200 turns on the primary winding and 50 turns on the secondary winding. If the input voltage is 100v, the output voltage would be?

A. 50V
B. 400V
C. 25V
D. 100V

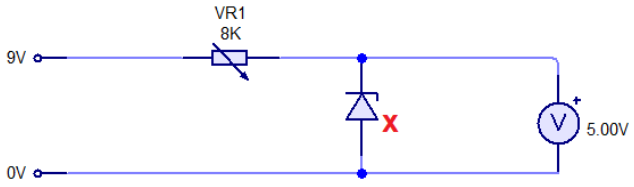
Q15.



The capacitor is set to a value of 150pF and the inductor has a value 845nH what amateur band would this trap be suitable for?

A. 15m
B. 20m
C. 30m
D. 40m

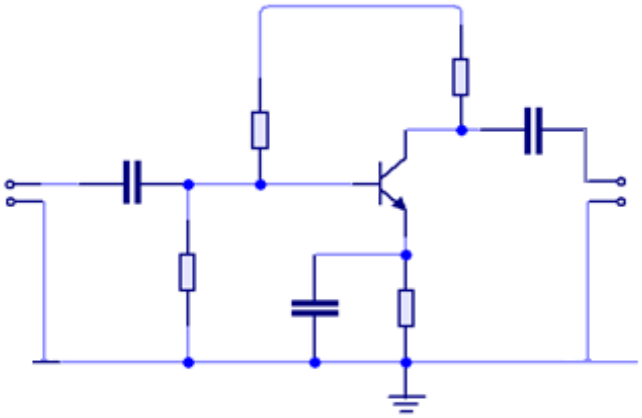
Q16.



The component marked X will

A. Conduct in forward bias mode when the voltage is below its designed value.
B. Conduct in reverse bias mode when the voltage is below its designed value.
C. Conduct in forward bias mode when the voltage meets its designed value.
D. Conduct in reverse bias mode when the voltage meets its designed value.

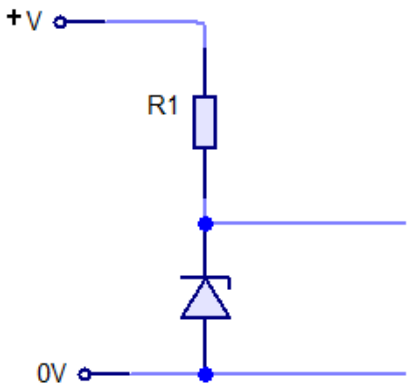
Q17.



In relation to the above circuit diagram which of the following is most accurate?

A. The signal at the input will be greater than that of the output and be out of phase by 90 degrees.
B. The signal at the input will be smaller than that of the output, however the output signal will be 180 degrees out of phase.
C. The signal at the output will be greater than that of the input but no phase shift.
D. The signal at the output will be greater than that of the input and be out of phase by 90 degrees.

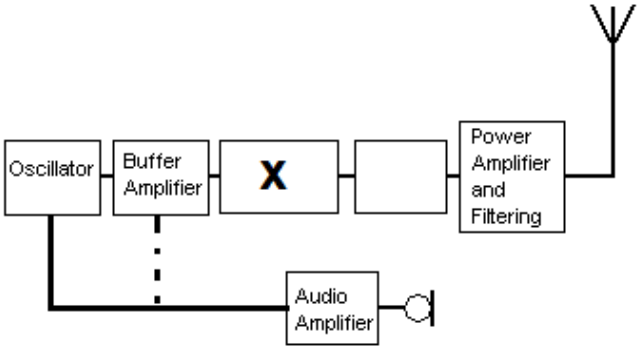
Q18.



The above circuit

A. can be used for voltage stability where R1 value is selected to limit the maximum current flowing through the diode.
B. can be used for voltage stability where R1 value is selected to limit the maximum current flowing through the Zener diode, the voltage supply must be greater in value to that of the output.
C. can be used for voltage inversion where R1 value is selected to limit the minimum current flowing through the diode.
D. can be used for voltage inversion where R1 value is selected to limit the maximum current flowing through the diode, the voltage supply must be greater in value to that of the output.

Q19.



The purpose of the block marked X is

A. to multiply the signal up the output frequency range.
B. to filter and set the correct level for the RF driver
C. to remove unwanted harmonics
D. to mix the audio frequency with RF

Q20. What would likely be the most serious consequence, in the use of an unstable carrier?

A. The receiving station would have difficulty receiving the signal of the transmitting station.
B. The transmission could interfere with nearby television receivers causing TVI.
C. The transmission could move outside the authorised band.
D. The transmission could interfere with other nearby amateur stations.

Q21. When a sine wave is produced via a direct digital synthesiser, the number of bits the synthesiser can generate will affect

A. the purity of the output signal.
B. the rise in time of the amplifier keying.
C. the stability of the synthesised signal.
D. the current available from the synthesiser.

Q22. Which of the following stages contain, a circuit which is, a non-linear process that distorts the input signal and consequently generates harmonics?

A. Low pass filter.
B. Frequency Multiplier.
C. A crystal oscillator.
D. Phase comparator.

Q23. A transceiver is fitted with an automatic level control (ALC) this will

A. minimise the overdriving of the power amplifier.
B. help to ensure AM or SSB modulation does not exceed 100%.
C. stabilise audio signals at a relatively constant level.
D. stop the transceiver, transmitting in the event of a poor SWR.

Q24. Unwanted parasitic oscillations may occur as a result of

A. normal operation of an variable oscillator.
B. stray coupling in a power amplifier.
C. harmonics from a frequency multiplier.
D. normal operation of a power amplifier.

Q25. Which of the following could be a value, representing the dynamic range of a receiver.

A. -135dBm
B. 60dBi
C. -10Vm2
D. 30Ah

Q26. In a double superhet receiver the first IF is

A. Higher in frequency than the second IF to improve rejection of adjacent frequencies.
B. Lower in frequency than the second IF to improve rejection of harmonic frequencies.
C. Higher in frequency than the second IF to improve rejection of image frequencies.
D. Lower in frequency than the second IF to improve rejection of adjacent frequencies.

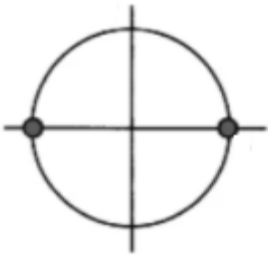
Q27. It is proposed to fit a pre-amplifier to an existing receiver. Which combination is likely to show the greatest overall improvement?

A. A pre-amplifier with a high internal noise and a receiver with high internal noise.
B. A pre-amplifier with a low internal noise and a receiver with high internal noise.
C. A pre-amplifier with a high internal noise and a receiver with a low internal noise.
D. A pre-amplifier with a low internal noise and a receiver with a low internal noise.

Q28. What is the main function of the AGC circuit in a radio receiver?

A. To improve the selectivity of the IF amplifier.
B. To keep the audio level near constant as signal levels vary.
C. To protect the RF amplifier from damage caused by large signals.
D. To make the radio much easier to tune to weak signals.

Q29.



Which of the following mode can be described by the above mage?

A. SSB
B. CW
C. PSK
D. FM

Q30. To transmit and receive on the 4m band, with a transceiver that covers only 1.8MHz - 30MHz, using a transverter your transceiver would need to be set to

A. the 10m band.
B. the 2m band.
C. the 40m band.
D. The 20m band.

Q31. You are making a ¼ wave matching section for a loop antenna to be used on the 40m band. This is from 75ohm coax which has a velocity factor of 0.88. What will the length of this ¼ wave matching section be?

A. 10.5M
B. 9.2M
C. 42M
D. 8.9M

Q32. The length of a half-wave dipole for the 20m band, including end factor correction would be?

A. 10.5M
B. 9.97M
C. 21.1M
D. 7.3M

Q33. Which of the following is correct in relation to return loss at transmitter?

A. It equals return loss at the antenna, divided by, twice the feeder loss.
B. It equals return loss at the antenna, multiplied by, twice the feeder loss.
C. It equals return loss at the antenna, plus, twice the feeder loss.
D. It equals twice the feeder loss, multiplied by the return loss at the antenna.

Q34. You are looking to match an antenna that has an impedance of 102 ohms at resonant frequency. You could do this by using a ¼ wave matching section of

A. 300 ohm twin feeder
B. 75 ohm coax
C. 50 ohm coax
D. 100 ohm coax.

Q35. Communication with satellites often use circular polarisation because

A. This avoids interference to earth based stations using horizontal or vertical polarisation.
B. Refractions in the ionosphere will change the polarisation by varying degrees.
C. The orientation of the satellite changes.
D. The satellite is often below the horizon.

Q36. The Maximum usable frequency (MUF) normally

A. remains constant regardless of time of day.
B. decreases during the hours of daylight.
C. is fixed for a given time of day.
D. increases during the hours of daylight.

Q37. Which of the following is not common at Very High Frequency ranges?

A. Earth Moon Earth transmission contacts.
B. Propagating signals via northern ionised gases.
C. Sporadic E propagation.
D. Propagation via F2 layer.

Q38. Your neighbour has installed his on T.V, down lead and antenna system. You have a look at the install and identify a few issues with the system, which of the following is most likely to affect the immunity?

A. Fitting an amplifier to the back of the T.V which has a built in high pass filter.
B. The poor / loose fitting of the connector on the down lead at the amplifier and at the antenna.
C. The use of shielded 75 ohm coax.
D. The use of a Yagi rather than dipole antenna.

Q39. When on the 20m band you notice that a bedside lamp gets brighter dims down and gets brighter again, doing a continuous cycle in this manner whilst you are transmitting.

A. You must stop transmitting as you are causing undue interference.
B. You must stop transmitting and purchase a new lamp as it appears faulty.
C. You can continue to transmit as the lamp fails to meet the EMC standards and is not immune.
D. You must stop transmitting as your equipment does not meet the relevant standard and is exceeding lamp immune levels.

Q40. You turn your transceiver on where the S meter is N stopping and cannot move any further with QRM. You decided to investigate it using a hand held receiver and discover that a newly acquired USB phone charger is radiating broad band RF.

A. This is normal for this type of charger you are required to install filters at your station.
B. This is not normal and is likely to missing components for cost cutting as it's an imported product and does not meet the UK standards.
C. This is not normal for the charger however states on the product that it meets the UK standard and therefore must be a fault with your hand held receiver.
D. This is normal as it is switching 220Vac to 5vDC and unwanted RF is radiated via electrical wires in order for the charger to remove these frequencies from the circuit.

Q41. A neighbour is complaining that operation of an HF, SSB transmitter is causing interference to his audio hi-fi system. It comprises a separate amplifier with speakers in two corners of the room; a separate tape cassette player and a separate CD player. The speaker leads are twin parallel lead wires of good quality and the audio leads are audio screened cable with phono plugs. During your investigation you discover that the interference only occurs when the CD player is selected at the amplifier. Which of the following is most likely to be the solution to this problem?

A. Placing ferrite rings on the speaker leads.
B. Placing a low pass filter in the aerial lead, close to the transmitter.
C. Placing ferrite rings on the mains lead of the transmitter.
D. Placing ferrite rings on the audio lead between the CD player and the amplifier.

Q42. Interference to a domestic FM radio receiver appears to be independent of the exact frequency to which the receiver is tuned but, is only heard when the receiver is tuned to a broadcast signal. A reasonable conclusion for this is that the interfering signal is

A. getting into the audio stages of the receiver.
B. being picked up in the IF stages of the receiver.
C. on a harmonic of the receiver frequency.
D. on a sub harmonic of the receiver frequency.

Q43. What is the purpose of a mains supply filter when fitted into a transceiver, mains power supply?

A. To remove noise and voltage spikes from the mains supply whilst attenuating and RF current conducted into the domestic wiring.
B. To stop mains born interference from entering the power supply and causing destruction of the transformer or regulator.
C. To attenuate RF currents conducted into the domestic wiring due to a less than perfect RF system or unbalanced antenna system.
D. To prevent damage to sensitive radio and electronic equipment due to thunder storm static, collected on the aerial.

Q44. What will the field strength reading be 10m away from an antenna which has 1000W ERP?

A. 14V/m
B. 26.4V/m
C. 22V/m
D. 8V/m

Q45. Which of the following, for feeding a balanced half wave dipole antenna, is LEAST likely to cause EMC problems?

A. Using a balanced feeder with the feeder leaving the antenna parallel to the antenna elements using a plastic spacer.
B. Using coaxial feeder with the feeder leaving the antenna parallel to the antenna elements using a plastic spacer.
C. Using a balanced feeder with the feeder leaving the antenna at 90 degrees to the antenna elements.
D. Using a coaxial feeder with the feeder leaving the antenna at 90 degrees to the antenna elements, thereafter buried underground.

Q46. When installing mobile transceivers into a road vehicle advice can be obtained from

A. The RSGB EMC committee leaflets.
B. Federation of Communication Services (UK) code of practice.
C. The Bureau of Motor Trade, ancillary install guide.
D. The I.T.U mobile radio guide.

Q47. Mrs Whyte, who lives next door, has complained that she cannot watch television when your transmitting antenna is pointing in her direction. Should you

A. recommend that she makes contact with the RSGB EMC Committee for a solution.
B. provide her with the web address of the BBC so she can lodge a complaint for their attention and formal investigation.
C. advise her that her TV does not comply with current EMC standards and that she should look towards renewing it for a smart LED TV.
D. suggest that you both might jointly investigate the matter to identify the problem and determine how it might be amicably resolved.

Q48. You are listening to T32GM a rare DX station operating on 14.205MHz. You listen and discover that people are working him on the same frequency, however he is taking time in picking out call signs, he

A. must be having QRM at his QTH and this is the reason he is unable to pick out stations more quickly and hear their return report.
B. Should operate split mode which would keep his transmit frequency clear and allow him to hear stations over a range of frequencies, increasing the QSO's.
C. must operate by numbers starting with 0 to 9 and only work station call signs with the same number being called in order to comply with the international DX good practice.
D. should increase his transmit power as people are not hearing him and are cold calling for a reply.

Q49. Which of the following frequencies should your Activity avoid interference to the experimental beacons?

A. 5264.0kHz
B. 5.290MHz
C. 5.374MHz
D. 5278.5kHz

Q50. In a domestic Protective Multiple earth (PME) electrical system

A. an earthing copper stake must be connected to the main earth terminal.
B. the main earth terminal will provide an excellent earth for stray RF.
C. the neutral supply is at the same potential as the main earth terminal.
D. earthed equipment will be safe if the neutral supply fails.

Q51. Which of the following provide guidance in relation to exposure to RF fields?

A. ICNIRP
B. ICNNRP
C. OFCOM
D. RSGB

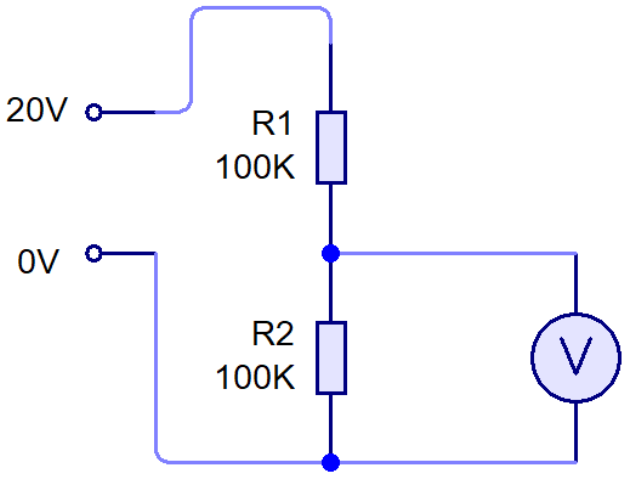
Q52. When operating a station at a portable location an amateur should

A. Take precautions to ensure that mains operated equipment is provided with suitable safety earth.
B. Take precautions to ensure that mains operated equipment is provided with suitable RF earth.
C. Only use battery - operated (DC)equipment
D. Disconnect the mains safety earth as all cables should be double insulated.

Q53. When operating portable a risk assessment should be conducted this is so that

A. club members will know who to blame when an injury occurs.
B. this negates the blame from the individual onto the person who conducted the risk assessment.
C. all potential risks are identified along with actions which are needed to mitigate the risk.
D. radio equipment is covered under car insurance when used as storage on a temporary basis.

Q54.



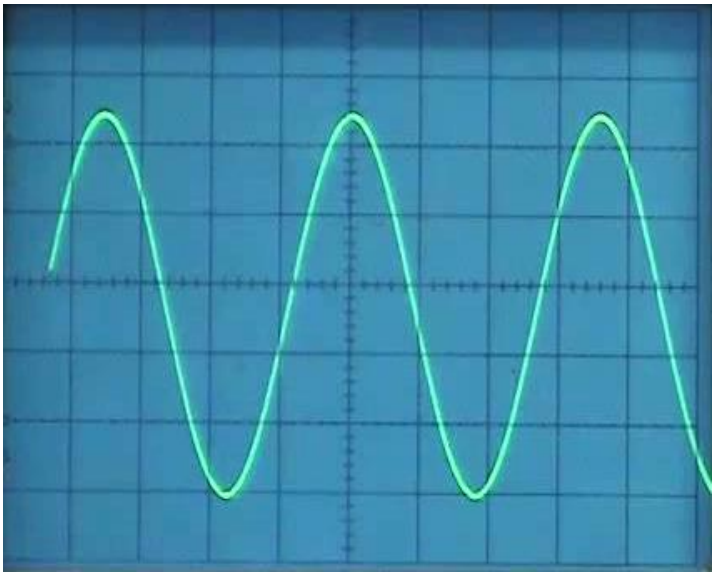
The voltmeter shown has a full scale deflection of 20V and an internal resistance of 100Kohm. Approximately what reading will it show?

A. 10V
B. 5V
C. 20V
D. 6.7V

Q55. Which of the following equipment has an input impedance that may vary or not be relying on a fixed 50 ohm input impedance?

A. SWR meter
B. Antenna analyser
C. Oscilloscope
D. Power meter

Q56.



This oscilloscope reading is set so that each division is 5 mS and 6v. What is the frequency that is being displayed on the meter?

A. 55Hz
B. 5Hz
C. 555Hz
D. 66Hz

Q57. You are transmitting 400W into your coax which travels to your antenna. You measure the reflected power which shows 50W. What is the return loss in dB?

A. 9dB
B. 3dB
C. 16dB
D. 26dB

Q58. When selecting components for use in areas where the temperature increases

A. must be taken into consideration as it could lower the capacitance value of capacitors.
B. must not be considered as temperature variation has no effect on components.
C. must be taken into consideration as it could turn a capacitor into an inductor.
D. must not be taken into consideration as the temperature cannot vary the capacitance value beyond its accuracy % tolerance.

ANSWERS

Q1 = C

Q2 = D

Q3 = C

Q4 = D

Q5 = A

Q6 = B

Q7 = C

Q8 = B

Q9 = B

Q10 = C

Q11 = C

Q12 = A

Q13 = A

Q14 = C

Q15 = B

Q16 = D

Q17 = B

Q18 = B

Q19 = A

Q20 = C

Q21 = A

Q22 = B

Q23 = A

Q24 = B

Q25 = A

Q26 = C

Q27 = B

Q28 = B

Q29 = C

Q30 = A

Q31 = B

Q32 = B

Q33 = A

Q34 = B

Q35 = C

Q36 = C

Q37 = D

Q38 = B

Q39 = C

Q40 = B

Q41 = D

Q42 = B

Q43 = A

Q44 = C

Q45 = D

Q46 = B

Q47 = D

Q48 = B

Q49 = B

Q50 = C

Q51 = A

Q52 = A

Q53 = C

Q54 = D

Q55 = C

Q56 = A

Q57 = A

Q58 = A