

CHEMISTRY

Paper 3173/12
Multiple Choice 12

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

General comments

Candidates found **Question 7** relatively straightforward.

There was evidence of guessing in **Questions 13, 15, 19, 24** and **38**. **Questions 24** and **27** were found to be particularly challenging.

Comments on specific questions.

Question 6

Candidates choosing option **A** mistook the ratio of relative atomic mass : proton number for the neutron : proton ratio.

Question 12

Option **B** was a common incorrect answer. These candidates correctly calculated the number of moles of methane. They used this as the answer rather than multiplying by 4 as required by the stoichiometry.

Question 13

There was some evidence of guessing by candidates suggesting that these candidates were not able to work out the products of the reaction and/or then select the correct ionic equation.

Question 15

This item required recall and application of different syllabus statements such as calculation with gas volumes, idea of stoichiometry and the concept of solution concentration. There was evidence of guessing by some candidates.

Question 18

Option **C** was a common incorrect answer. These candidates did not recall/use statement **9.5(a)** in the syllabus. '...including identity of electrodes should be given together with equations for the electrode reactions'.

Question 19

All options were commonly seen. This suggests some candidates were either not sure how to calculate the activation energy of the reverse reaction and/or select the correct description of the forward reaction.

Question 22

Option **C** was a common incorrect answer. These candidates incorrectly linked the 'lower temperature' to a smaller volume of gas in line Y compared to line X. They also missed the greater rate of reaction of line Y compared to line X.

Question 24

Option **D** was chosen by some candidates who did not link the possible oxidation of Fe^{2+} to Fe^{3+} by acidified potassium manganate(VII).

Question 27

Options **A** and **B** were both commonly seen. Candidates selecting option **A** knew that ammonium chloride will decompose when heated by itself, but overlooked that the products of that reaction do not include hydrogen chloride. Many candidates did not recall/use statement **7.1(g)** in the syllabus 'describe the characteristic properties of bases in reactions with acids and with ammonium salts'.

Question 28

Candidates selecting option **C** had realised that filtering is part of the procedure but overlooked that the product is not obtained from the filtrate.

Question 29

Option **A** was a popular incorrect choice, with candidates mistakenly identifying copper(II) chloride as insoluble.

Question 31

Option **B** was a common incorrect answer. These candidates incorrectly had reaction 3 as an oxidation reaction.

Question 34

Candidates selecting option **B** did not recall/use statement **10.1(e)(iii)** from the syllabus 'nitrogen oxides from lightning activity and internal combustion engines'.

Question 35

Candidates selecting option **B** did not appreciate that sea water is a solution rather than a mixture of liquids and so (simple) distillation, not fractional distillation, is used.

Question 38

This item requires recall and application of different parts of the syllabus, in this case, to recall or deduce the formulae of the four compounds and then to deduce the empirical formulae of the compounds. There was evidence of guessing on this question.