Candidate 2

Question 1(a)(i)

The candidate was awarded **0 marks** because the response is incorrect, as it cannot be determined if a line is drawn within the symbol.

Question 1(a)(ii)

The candidate was awarded **0 marks** because 'voltage goes above a certain point' is incorrect physics.

Question 1(a)(iii)

The candidate was awarded **4 marks** because they identified the correct fuse rating (1) and justified this choice by the selection of a correct relationship (1), made correct substitutions (1) and calculated a correct value for the current in the blender (1).

Question 1(b)

The candidate was awarded **0 marks** because the response is incorrect, as there is no indication of a repeated change in direction.

Question 2(a)(i)

The candidate was awarded **4 marks** because a correct relationship has been stated, as per additional guidance (1), a correct calculation of total resistance, '15+25', has been made (1), all substitutions are correct (1) and an acceptable final answer, including unit, has been stated (1).

Question 2(a)(ii)

The candidate was awarded **3 marks** because correct relationships have been selected, as per method 2 in the additional guidance (1), correct substitutions have been made (1) and a correct final answer, including unit, has been stated (1).

Question 2(b)(i)

The candidate was awarded **3 marks** because a correct relationship has been selected (1), correct substitutions have been made (1) and a correct final answer, including unit, has been stated (1).

Question 2(b)(ii)

The candidate was awarded **0 marks** because an incorrect effect has been stated (0) and no further marks are therefore accessible.

Question 3(a)

The candidate was awarded **3 marks** because a correct relationship has been selected (1), correct substitutions have been made (1) and a correct final answer, including unit, has been stated (1).

Question 3(b)

The candidate was awarded **1 mark** because ‘pressure increases’ is correct (1), ‘the more times they hit’ does not clearly indicate that the particles collide with the container walls more frequently (0), and there is no description of the effect on the overall force on the walls (0).

Question 3(c)

The candidate was awarded **1 mark** because the axes are correctly labelled (p and V may appear on either axis) (1), but the shape of the graph is incorrect (0).

Question 4(a)(i)

The candidate was awarded **3 marks** because a correct relationship has been selected (1), correct substitution have been made (1) and an acceptable final answer, including unit, has been stated (1).

Question 4(a)(ii)

The candidate was awarded **0 marks** because the response is incorrect.

Question 4(b)

The candidate was awarded **3 marks** because a correct relationship has been selected (1), correct substitutions have been made (1) and a correct final answer, including unit, has been stated (1).

Question 4(c)

The candidate was awarded **0 marks** because no diffraction of waves into the 'shadow' regions behind the walls has been shown (0), and no further marks are therefore accessible.

Question 4(d)

The candidate was awarded **1 mark** because they have clearly indicated that the energy has been spread over a greater area, as detailed in the additional guidance.

Question 5

The candidate was awarded **2 marks** because they have demonstrated a reasonable understanding of the physics involved.

Question 6(a)

The candidate was awarded **1 mark** because the response '...counted the average random count rate in the room...' is a suitable description of background radiation.

Question 6(b)(i)

The candidate was awarded **1 mark** because the response is correct, including a correct unit.

Question 6(b)(ii)

The candidate was awarded **0 marks** because there is no indication of the number of half-value thicknesses (0) and the final answer is incorrect (0)

Question 6(b)(iii)

The candidate was awarded **1 mark** because they clearly indicated that half-value thickness for aluminium is greater than that for lead.

Question 6(c)

The candidate was awarded **3 marks** because a correct relationship has been implied by the substitutions (1), correct substitutions have been made (1) and a correct final answer, in hours, has been stated (1).

Question 7(a)

The candidate was awarded **1 mark** because the response is correct.

Question 7(b)(i)

The candidate was awarded **2 marks** because they have clearly indicated that the neutrons produced in the initial reaction go on to cause further reactions (1) and that this causes a 'chain reaction' (1).

Question 7(b)(ii)

The candidate was awarded **1 mark** because a correct relationship has been selected (1), but the candidate has made an incorrect attempt to calculate the total energy (0), which has resulted in the substitutions into the relationship being incorrect (0) and no further marks are therefore accessible.

Question 7(c)

The candidate was awarded **0 marks** because 'purify water' is not a suitable use of nuclear radiation.

Question 8(a)

The candidate was awarded **0 marks** because the response is incorrect.

Question 8(b)(i)

The candidate was awarded **3 marks** because a correct relationship has been stated (1), correct substitutions have been made for all areas of the graph (1), and a correct final answer, including unit, has been stated (1).

Question 8(b)(ii)

The candidate was awarded **3 marks** because a correct relationship has been selected (1), correct substitutions have been made (1) and a correct final answer, including unit, has been stated (1).

Question 8(c)

The candidate was awarded **3 marks** because a correct relationship has been selected (1), correct substitutions have been made (1) and a correct final answer, including unit, has been stated (1).

Question 9(a)

The candidate was awarded **0 marks** because they have not indicated that the forces act opposite in direction (0).

Question 9(b)

The candidate was awarded **3 marks** because a correct relationship has been selected (1), correct substitutions have been made (1) and a correct final answer, including unit, has been stated (1).

Question 9(c)

The candidate was awarded **4 marks** because they have correctly determined the unbalanced force (1), a correct relationship has been selected (1), correct substitutions have been made (1) and a correct final answer, including unit, has been stated (1).

Question 10

The candidate was awarded **3 marks** because they have demonstrated a good understanding of the physics involved.

Question 11(a)

The candidate was awarded **0 marks** because the response is incorrect.

Question 11(b)

The candidate was awarded **0 marks** because the effect is incorrect (0) and no further marks are therefore accessible.

Question 11(c)

The candidate was awarded **0 marks** because the use of the $E_p = mgh$ relationship is incorrect physics in this situation and no marks are therefore accessible.

Question 12(a)(i)

The candidate was awarded **1 mark** because the response is correct and an appropriate unit has been included.

Question 12(a)(ii)

The candidate was awarded **1 mark** because a correct relationship has been selected (1), but not all of the required substitutions are correct (0) and no further marks are therefore accessible.

Question 12(b)(i)

The candidate was awarded **0 marks** because the response is incorrect.

Question 12(b)(ii)

The candidate was awarded **1 mark** because the response is correct.