PHYSICS

Paper 0625/01
Multiple Choice

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

General comments

The number of candidates taking the paper this year increased again to 11675. Their mean score was 29.686 and the standard deviation was 6.836.

This year the easiest items (facility of 90% or higher) were items **2**, **4**, **6**, **9**, **13**, and **25**, and the hardest (facility 60% or below) were items **3**, **10**, **20**, **22**, **27**, **30** and **39**.

Comments on individual questions

(Percentages in brackets after an item number show the proportion of candidates choosing the correct response).

The first item **1** (83%) proved quite straightforward for most, but distractor C attracted 11% of responses, candidates forgetting to subtract 6 mm from the external diameter. Item **2** (95%) caused little difficulty, but item **3** (56%) showed weaknesses in candidates' understanding of free-fall acceleration: 21% and 16% opted for C and D respectively, believing that acceleration increases with weight. Although item **4** (93%) challenged only a few, more than one in five chose A in item **5** (72%), failing to read the question carefully and giving the mass of oil used rather than the mass of the empty bottle. Also well-answered was the recall item **6** (91%), but the understanding-based item **7** (75%) caused a fifth of candidates opt for D, falsely linking greatest density to greatest volume. In item **8** (63%) 30% believed only two changes were possible, but the format of the question cannot indicate what mistakes were made. Item **9** (90%) was not too demanding, unlike item **10** (55%) in which all options were popular, especially C - this topic would seem to be worth some attention.

Since 14% identified a link between internal energy and 'cathode rays in a cathode ray tube' (distractor C) in item **11** (76%), knowledge of energy types also appears to be unsound for several, and the syllabus term 'internal energy' would be worth stressing. Similarly the manometer item **12** (71%) lead nearly one in five to choose D. Item **13** (91%) was well answered, as was item **14** (86%). The cooling curve in item **15** (64%) caused 29% of candidates to opt for point C, where all the wax would be solid, and almost a quarter chose C in item **16** (66%), believing there to be a negative correlation between cooling time and thermal capacity: this concept caused similar difficulty last year. A similar proportion opted for B in item **17** (66%) failing to remember that convection currents caused by heating are always upwards initially, and 19% in item **18** (78%) thought that cooling air made it less dense. The first waves item **19** (85%) generally caused little difficulty, whereas item **20** (41%) proved much more demanding: all distractors were popular, particularly (and understandably) B, with candidates failing to register that the waves were moving into deeper water.

Item **21** (82%) was quite well answered, with D being the most popular incorrect choice. In item **22** (55%) option A proved plausible to 37% of candidates who believed the angle of incidence to be measured between the incident ray and the mirror, rather than the normal. There was a much better performance for items **23** (84%), **24** (89%), **25** (91%) and **26** (84%). This was not the case in item **27** (49%) in which almost half of all candidates believed either A or C to be correct field directions, showing a lack of knowledge that field lines start on a north pole and end on a south. In item **28** (70%) 15% believed that the longest *and* thickest wire would have the greatest resistance, and in item **29** (83%) a similar proportion thought that electrons carry positive charge.

The most poorly answered was item **30** (36%): all distractors worked well, and it was clear that potential dividers are not well understood. Candidates fared better in item **31** (70%), although a significant number chose B and failed to realise that the relay would close. Item **32** (78%) showed a stronger performance, with each distractor working similarly well, and the recall item **33** (88%) was better answered still. In item **34** (63%) nearly a third believed electric shock to be the greatest risk of excessive current. Those who failed to answer item **35** (70%) correctly chose freely from all the other possibilities. Item **36** (85%) was a standard type of question and candidates were generally well prepared for it, but rather more were confused by item **37** (75%), showing another case of free choice from the alternatives to the key. Another recall item **38** (85%) was well answered, but the calculation required in item **39** (46%) proved too difficult for the majority: option C was the most popular error here, rather than A (still quite popular, and produced by halving the amount four times rather than doubling it). Finally most candidates coped well with item **40** (86%).

PHYSICS

Paper 0625/02
Core Theory

General comments

There were a good number of competent candidates who attempted this paper. There were not large numbers of outstanding candidates, but neither were there large numbers of very weak ones. Generally, candidates appeared to be adequately prepared for the examination. Most candidates scored something on each question, and there were no questions which proved unreasonably hard for all candidates.

Where the candidate knew the underlying Physics, any accompanying mathematics was usually clearly indicated, although there are still some candidates who risk losing marks by failing to show their working. Poor use of units is not penalised too heavily on this paper, but it is an important aspect of all sciences and it was pleasing to see that most candidates were careful in this matter.

Comments on specific questions

Question 1

(a)(b)(c) Most candidates scored well on this question, but there were some who did not draw carefully enough. (4 min 20s)

Question 2

This was a very structured question, and candidates who worked carefully and thoughtfully through it often scored good marks.

(a) A simple calculation which most could answer correctly. (400s)

(b) The graph drawing often was less than satisfactory. Most candidates, having correctly worked out that in stage 2 the cyclist would travel for 400s, nevertheless ended stage 2 at 400s instead of 420s. The usual mistakes in graph plotting did occur, but not very often. It would appear that candidates can plot graphs, if they use the correct figures.

(c) Most candidates had difficulty in finding the distance travelled. Very few explained what they were doing, and just presented a jumble of figures. Quite often, they attempted to calculate the area under their incorrect graphs, whereas if they had used the correct figures from the question and (a), they would have obtained the correct result. Many forgot the ½ in the calculations of areas of triangles.

(d) This was usually correctly calculated. (10.8 m/s)

Question 3

The whole of this question was poorly done. Very few candidates have any understanding of moments or stability. Even in part **(a)** there was only a handful who knew that the least force would be applied at A, and very few of these showed the force in an upward direction.

Question 4

Generally, candidates showed some understanding of energy transformations.

(a) Most identified the correct bird and could justify their choice.

(b) (c) Once again, most could answer this correctly.

(d) There were some who thought the PE would increase, but most knew that it would decrease somehow. **Very** few, though, said anything about what happened to it. Those who did usually said it was changed into KE, but very few said it ended up as heat. This is an area which candidates frequently find difficult, and this was another example.

Question 5

The details in the table were usually correctly identified, so that many candidates scored all four marks. However, much more difficulty was found in explaining what happens during evaporation. It would be well to point out that in answers such as these it is not usually acceptable to use in the answer the term used in the question. Most answers, which showed any understanding, were along the lines of "The molecules near the surface gain energy to evaporate." The basic fact needed in the answer is that evaporation is molecules breaking free, and then some further elaboration.

Question 6

(a) Perhaps it is the case that candidates at this level respond well to tables and tick-boxes, because as in **Question 5**, this was well answered.

(b) This was not very well understood. Some candidates said that the piston must be moved up or down, which is hard to understand. There was a sizeable minority who thought that nothing need be done in (i).

Question 7

This was a strongly structured application question, and candidates responded well.

(a) Most had some understanding and could answer clearly. There were some who talked about absorbing heat. Whilst "poor conductor of electricity" was acceptable in (ii), "good conductor of electricity" was not an appropriate answer to (i).

(b) Conduction, convection and radiation seemed to be well understood, but some candidates lost a mark by ticking evaporation in (ii).

(c) It was pleasing (and unexpected) to see that a large number realised that the soldering iron must be losing heat at the same rate as that at which it was being supplied.

Question 8

(a) Most obtained the correct answer. (50Hz)

(b) The number of candidates, who realised that the frequency would be their answer to (a) multiplied by 4, could not have reached double figures, it was so rare to see. Most tried some form of

velocity = frequency x wavelength or 1/frequency. (200Hz)

(c) It was possible to score the marks for this by making an appropriate deduction from part **(b)**, but most failed to score this mark. The mark was not awarded for just "yes" or "no", or even "yes, it is in the audible range", but for an answer which also stated what the audible range is.

Question 9

The answers to this question were rather disappointing, and a lot of candidates scored marks, only because correct working following an earlier mistake was not penalised, even though it led to an incorrect value.

(a) Probably only half the candidates could identify the connection as series or potential divider. In (ii), (iii) and (iv), the application of V=IR was often very uncertain, with R = I/V a very common mistake. In part **(v)**, very few realised that the p.d. between X and Y is the same as the answer to (iv).

(12Ω, 0.5A, 5V, 5V)

(b) It was interesting to see how few realised that A would be at 6V and B at 0V. Likewise, it was rare to find a candidate who could apply the logic of part **(a)** to part **(b)(ii)** and get the right answer. Potential divider circuits are very easy to understand, if taught systematically, and teachers are advised that time spent on this is well spent, not only in aiding the understanding of potential dividers, but also in general understanding of volts, amps, ohms and the handling of circuits.

Question 10

Not only had very few got any idea of how to do this demonstration, but those who had, struggled to explain themselves clearly. Most expected that the millivoltmeter would show a reading, but it is doubtful if any of them realised that it was only a temporary deflection. The examples of devices which were given were usually examples involving the magnetic effect of a current, rather than electromagnetic induction. Clearly, this is an area requiring careful teaching.

Question 11

Answers to this question scored very poorly. It is doubtful if there was a single candidate who scored full marks, and most were lucky to score 2 marks from a jumble of lines purporting to be magnetic field lines. Magnetic field diagrams are always poorly drawn in examinations, and it was hoped in this question that, by isolating particular lines to be drawn, candidates would be encouraged to be more careful. They were not....... Most knew that the direction went from N to S, but large numbers of these failed to score the mark in (b) because they did not actually show the field lines coming from the poles, but had them “spraying out” from the black dots at each end of the magnet.

Question 12

The responses to this question were either very good or very bad. It would seem that some Centres fail to spend sufficient time on this section of the syllabus. An enormous number of candidates believe that alpha and beta particles contain hundreds of protons, neutrons and electrons, and very few could cope with the equation of part **(c)**. Interestingly though, there seemed to be an ability to answer (b) at least partly correctly.

PHYSICS

Paper 0625/03

Extended Theory

General comments

There were a good number of competent candidates who attempted this paper, and it was pleasing to mark the scripts of able candidates who have been well prepared.

However, it has to be said quite strongly that there were many candidates who were ill-advised to enter this paper, as they were simply not of the necessary calibre. It is true that all grades from A* to G are available to candidates sitting this paper, but large numbers of weaker candidates would be better advised to enter for paper 2 (core), which is designed to allow weaker candidates to show what they know and can do. Such candidates can obtain up to grade C from paper 2. It is sad to see candidates scoring only a handful of marks on a paper which is far to difficult for them, when they could be displaying their ability much more effectively on a paper more designed for them, and almost certainly obtaining a more satisfactory grade.

Most candidates managed to score at least some marks on most questions and there were no questions which proved unreasonably hard for all candidates.

Where the candidate understood the underlying Physics, any accompanying mathematics was usually clearly indicated, although there are still some candidates who risk losing marks by failing to show their working. The correct use of units is expected throughout the paper, and incorrect and missing units are penalised. It was pleasing that most candidates used units well.

Comments on specific questions

Question 1

(a) Most candidates knew about centripetal force and that it would increase when the car speeds up.

(b) It was pleasing that most candidates attempted some form of tangential arrow for part **(i)**, even if some were too careless to draw it sufficiently accurately. However, answers to part **(ii)** were mostly of the form "the centripetal force was not big enough". What was required was an understanding of the role of friction between the tyres and the track.

(c) Most candidates of any ability were able to score well on this part of the question. In part **(i)**, "constant motion" was not regarded as satisfactory, but in order not to penalise too many candidates "constant velocity" was awarded the mark, even though it was the speed, not the velocity, which remained constant, as the track was circular

(212.5 cm, 8.3 cm/s)

Question 2

(a) Most candidates attempted to answer in terms of forces. Such candidates rarely scored any marks, since the question clearly asks about moments of forces. What was required was something relating to the opposing moments of the steam and the weight W.

(b) This should have been easy for all candidates, but many found difficulty in coping with being given a moment (12 Nm) instead of being asked to calculate it. Having obtained an answer, right or wrong, to part **(i)**, Force/area was all that was required in **(ii)**. Errors taken into (ii) from (i) were not penalised further if there were no further mistakes.

(60N, 2×10^5 Pa)

Question 3

(a) There were few mistakes made by competent candidates in this part, except, unfortunately, omitting to involve the acceleration due to gravity (or weight).

(b) Answers to this part were very weak, even from many good candidates. Most realised that PE is turned into something else, but usually it was KE into which it turned. Very few made any reference to it ending up as heat. A lot had the pattern PE $\rightarrow$ KE $\rightarrow$ PE.

(1800J, 150W)

Question 4

(a) It would seem that this was an experiment which few had seen or done. It was a rarity for a candidate to correctly state the 2 readings which would need to be taken. Most seemed to think that all that was needed was the mass of the water and the mass of the ice.

(b) Better candidates were able to cope with this, but there were some interesting answers from other candidates.

(c) When attempted, the calculation was often well done. A common mistake was to attempt to use the equation Q = mcT.

(d) Many had a good idea of the reasons, but a huge number wrote down the usual "because heat is lost to the surroundings", whereas in this experiment heat is gained from the surroundings. There were many very intelligent reasons given, all of which were suitably rewarded.

(427J/g)

Question 5

(a) The description of how the apparatus was used was frequently poorly done. Candidates seem to be losing the ability to describe an experimental procedure with any clarity, and this is something teachers could well take into account when planning their teaching strategy. On this paper and on paper 2, it is highly likely that candidates will be asked to describe a simple procedure. Even though most of the candidates for IGCSE Physics will not have English as their first language, it is still essential for them to be able to express themselves in terms which demonstrate their understanding of Physics, even if grammar and spelling are less than perfect.

(b) There are some basic definitions which it is very helpful for a candidate to have memorised. The answers to this part clearly identified those who had been taught the meanings of "sensitivity" and "linear". Sensitivity was often confused with accuracy. It should be noted that sensitivity is nothing to do with responding to or detecting small changes in temperature – even insensitive thermometers respond to and detect small changes in temperature. What is important is that there should be a large (or at least, noticeable) change in the reading in response to a small temperature change. Likewise, "linear" is nothing to do with straight lines (except in terms of a graph), but refers to equal spaces between degrees on the scale.

Question 6

(a) The majority of candidates could draw in the two rays with acceptable accuracy.

(b) The critical angle part of this question was approached in a slightly unusual way, and this seemed to confuse many candidates. The second ray being "almost parallel to AE" should have indicated to the candidates that this was the critical ray. For some, it did, but for others it did not. The marking scheme made allowance for both.

(c) Errors carried forward from (b) were not penalised further in this part. Most had some idea of n = speed in air/speed in glass.

(88-90°, 43°, 1.47, 2×10^8 m/s)

Question 7

This was another question in the style of **Question 5**, and again the same weaknesses were displayed, namely imprecise descriptions of what had to be measured and how. The most common omission was the description of how the person doing the timing knew when the sound had been made. "Measure the time between making the sound and hearing it" was not adequate for (b); instead something like "the time between the flash and the bang" would have been satisfactory. In part **(e)**, many were able to choose appropriate speed for sound in air and in water, which was good because the answer for speed in air, in particular, did not look correct at first.

Question 8

(a) There were several possible circuits which were acceptable, and most candidates were able to draw one of them. The usual mistakes appeared, of course – voltmeters in series, ammeters in parallel etc. It is important that Physics students should be able to use standard circuit symbols, but for the purpose of this diagram, any recognisable symbol was accepted for each component.

(b) Candidates generally showed themselves very capable when evaluating the quantities in this part, and units were almost always correct throughout.

(c) There were some interesting attempts, but most were able to score at least one of the marks.

(3A, 4Ω, 2 Ω, 1080J)

Question 9

(a)(b) The apparatus in the diagram was possibly strange to most candidates, but it should have been possible for all but the weakest candidates to make a sensible attempt to apply their knowledge about forces on conductors. Unfortunately this did not seem to be the case, and even promising candidates were answering in terms of induced currents and induced fields and magnetised spokes, and so on.

(c)(d) It was not expected that the drawings would be of high artistic merit, and most attempts were not of such quality. However, there were some very creditable drawings, which many teachers would be very pleased to produce. What was important was that the basic parts of the motor should be indicated in something like the right positions and proportions. There were many which filled these criteria. However, very few could describe the action of the commutator with any clarity. The key points looked for were the brushes connecting to the other split ring every half turn and the reversal of the current through the coil every half turn.

Question 10

Answers to this question were usually weak. In some cases it would appear to have been inability to express an idea clearly, in which case the answer was marked as sympathetically as possible. In most cases, though, it was the fact that the candidate simply did not know how a thermistor or a transistor or a potential divider worked. This weakness affected both parts **(a)** and **(b)**. Many knew that the resistance of a thermistor decreased when the temperature rose, but could get no further. Even at the level of an extended syllabus paper, it was clear that many candidates could not distinguish between heat and temperature. Any sensible suggestion that involved an automatic lighting system would have scored the mark for **(c)**. Some otherwise intelligent attempts failed to score because they switched on, for instance, a heating system. The question asked for one practical use of **this circuit**, not just any switching circuit.

Question 11

(a) The responses to this question were either very good or very bad, mostly very bad. It would seem that some Centres fail to spend sufficient time on this section of the syllabus. A common mistake, even amongst candidates who basically knew what was happening, was to start the deflections of A and B from the point where the printed lines end, instead of at the gold foil. This carelessness is a silly way to lose marks. Another common error was to treat the alpha particles as if this were an absorption experiment, and showing A getting a little way past the foil, B a little further and C a little further still. Clearly, such candidates have no knowledge about what is happening at the foil, however it was quite a common answer.

(b) A few candidates had a good idea how the results of the experiment showed the existence of nuclei, by arguing from the evidence of the deflections, or lack of, to the proposition that this can only be explained by of concentrated mass particles separated by large empty gaps. It was more common, however, for candidates to start with the assumption of nuclei and simply repeat what they had answered in (a). The explanation is difficult, admittedly, but the higher grade candidates should be able to cope with such material.

PHYSICS

Paper 0625/04
Coursework

General comments

The candidates at the ***majority of Centres*** were given many opportunities to demonstrate their practical skills using a varied range of tasks from different areas of the specification; clearly a large amount of good work has been completed by teachers and candidates. The majority of samples illustrated clear annotated marks and comments, which was helpful during the moderation process.

It is pleasing to see that points made from previous reports were noted. Although the following points are still relevant to some of the Centres:

- It should be noted that although Moderators do not expect to see written evidence of Skill C1, they do expect to be provided with details of how candidates achieved the marks awarded.

- It is advisable that a maximum of two skill areas should be assessed on each practical exercise.

PHYSICS

Paper 0625/05
Practical

General comments

The aim of the examination is to enable candidates to display their knowledge and understanding of practical physics techniques. These include

- graph plotting
- tabulation of readings
- manipulation of data to obtain results
- drawing conclusions
- dealing with possible sources or error
- control of variables
- accurate measurements
- choice of the most effective way to use the equipment provided

The general level of competence shown by the candidates was sound. Very few candidates failed to attempt all sections of each of the questions and there was no evidence of candidates suffering from lack of time. Many candidates dealt well with the range of practical skills tested. Each question differentiated in its own way. The majority of candidates showed evidence of preparation for the different types of question in the examination, but too many seemed unfamiliar with the techniques involved in the optics question

Comments on specific questions

Question 1

(b) – (i) Most candidates were able to record sensible temperature values with the correct unit.

(j) (i) Candidates who thought through the question with care were able to make a sensible comment about heat loss to the surroundings or the fact that the beaker itself was not included in the theoretical calculation.

(ii) Candidates were expected to make two simple suggestions, for example insulating the beaker and adding a lid. It was noticeable that some candidates do not appreciate the difference between improvements to a practical (or precautions taken to improve accuracy) and the issue of the control of variables. Some candidates wrote about the latter as if they had learned some responses that might be appropriate but did not read the question sufficiently carefully to understand what was being asked.

Question 2

(a) – (h) Most candidates were able to complete the records in the table accurately.

(i) The graph was generally accurately plotted with the temperature scale labelled but a suitable temperature scale using at least half of the available grid was often not used. A significant number of candidates lost marks since their lines were too thick or they drew a poorly judged best fit line.

(j) A pleasing number of candidates were able to suggest why the 'suggestion' was wrong by noting that the line did not pass through the origin or that it had a negative gradient or that when *b* increased, *d* decreased.

(k) This was an easy mark to score requiring only sensible reference to a protractor, set-square, spirit level or plumbline. Candidates who did not know the name of the piece of equipment but described it clearly were given credit. The best candidates are confident with the technical terms of Physics.

Question 3

(b) – (g) Most candidates were able to record sensible values with the correct units. Some wrote values of p.d. or current that were clearly far too large and were therefore penalised. The calculation of resistance was a problem for only a few who inverted the equation. Thanks to Supervisors setting up the experiment with care many candidates obtain values of resistance within the tolerance allowed.

(h) & (i) The best candidates were able to see that as the diameter of the wire was halved, the resistance increased by a factor of four and therefore could score the mark for ticking the last box and the mark for a good explanation.

Question 4

(a) – (h) Most candidates were able to record readings that were given appropriately according to the units given in the column headings in the table. However this question revealed that many candidates are unfamiliar with this type of experiment, as the values given could not have been taken with a clearly focused image. This meant that such candidates lost marks awarded for the quality of the results, but they could still access the marks for accurate recording and processing of the readings.

(i) Candidates who were familiar with using lenses were able to make sensible suggestions about using a darkened room (or area), making sure that the screen and lens were vertical or details about how to take the distance readings accurately.

PHYSICS

Paper 0625/06
Alternative to Practical

General comments

The aim of the examination is to enable candidates to display their knowledge and understanding of practical physics techniques. These include

- graph plotting
- tabulation of readings
- manipulation of data to obtain results
- drawing conclusions
- dealing with possible sources or error
- control of variables
- accurate measurements
- choice of most suitable apparatus

It is assumed that, as far as is possible, the IGCSE course will be taught so that candidates undertake regular practical work as an integral part of their study of Physics. This examination should not be seen as suggesting that the course can be fully and effectively taught without practical work.

Clearly, some of the skills involved in practical work can be practised without doing experiments – graph plotting, tabulation of readings, etc. However there are parts of this examination in which the candidates are effectively being asked to answer from their own practical experience.

The answers given by some candidates in this examination point to a lack of practical Physics experience.

Some candidates have a good overall understanding of what is required, backed by personal practical experience and therefore score high marks. Others, obtaining lower marks, appear to have limited experience.

Almost without exception candidates attempted all the questions. The examination appeared to be accessible to the candidates and there was no mark that proved unobtainable.

Comments on specific questions

Question 1

(a) & (b) Most candidates dealt successfully with this straightforward introduction to the paper.

(c) (i) Candidates who thought through the question with care were able to make a sensible comment about heat loss to the surroundings or the fact that the beaker itself was not included in the theoretical calculation.

(ii) Candidates were expected to make two simple suggestions, for example insulating the beaker and adding a lid. It was noticeable that some candidates do not appreciate the difference between improvements to a practical (or precautions taken to improve accuracy) and the issue of the control of variables. Some candidates wrote about the latter as if they had learned some responses that might be appropriate, but did not read the question sufficiently carefully to understand what was being asked.

Question 2

(a) - (e) Most candidates were able to complete the records in the table accurately.

(f) The graph was generally accurately plotted with the x-axis labelled and suitable. A significant number of candidates lost marks since their lines were too thick or they drew a poorly judged best fit line.

(j) A pleasing number of candidates were able to suggest why the 'suggestion' was wrong by noting that the line did not pass through the origin or that it had a negative gradient or that when *b* increased, *d* decreased.

(k) This was an easy mark to score, requiring only sensible reference to a protractor, set-square, spirit level or plumbline. Candidates who did not know the name of the piece of equipment but described it clearly were given credit. The best candidates are confident with the technical terms of Physics.

Question 3

(a) Most candidates completed the table correctly giving both values to either 2 or 3 significant figures.

(b) The best candidates were able to see that as the diameter of the wire was halved, the resistance increased by a factor of four and therefore could score the mark for ticking the last box and the mark for a good explanation.

(c) Many candidates drew a correct diagram. The symbols were generally well known. Some candidates did not know where to place the voltmeter, displaying a lack of understanding of a parallel circuit.

Question 4

(a) Most candidates calculated the focal length values correctly and were able to calculate the average. Some lost a mark for giving the answer to more than 3 significant figures and some for not giving the unit (m).

(b) & (c) Candidates who were familiar with using lenses were able to make sensible suggestions about using a darkened room (or area), making sure that the screen and lens were vertical or details about how to take the distance readings accurately. Such candidates also knew from their experience that the image would be upside down.

Question 5

(a) This question again showed which candidates were familiar with practical work. It was based on a 'standard' experiment. The most common mistakes in the table were to label the second column as if it were the original length of the spring and a heading in the third column making it clear that the candidate did not understand the idea of extension.

(b) Candidates who were familiar with discussing control of variables were able to make at least two good suggestions. Many candidates showed that they were confused about the difference between controlling variables and taking precautions to improve accuracy.