

Mark Scheme (Results) Summer 2007

GCSE

GCSE Science (1522/6H)

USING THE MARK SCHEME

1. This mark scheme gives you;
 - * an idea of the type of response expected
 - * how individual marks are to be awarded
 - * the total mark for each question
 - * examples of responses that should not receive credit.
2. ; separates points for the award of each mark.
3. / means that the responses are **alternatives** and either answer should receive full credit.
4. () means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.
5. Phrases/words in **bold** indicate that the meaning of the phrase/word is **essential** to the answer.
6. OWTTE (or words to that effect) and eq (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.
7. 'Ignore' means that this answer is not worth a mark but does not negate an additional correct response.
8. 'Reject' means that the answer is wrong and negates any additional correct response for that specific mark.
9. ORA (or reverse argument) indicates that the complete reverse is also valid for the award of marks.
10. ecf (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

MARKING

1. You must give a tick (in red) for every mark awarded. The tick must be placed on the script close to the answer. The mark awarded for part of a question should be written in the margin close to the sub-total.
2. The sub-total marks for a question should be added together and the total written and ringed at the end of the question then transferred to the front of the script.
3. Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.
4. **Do not** award marks for repetition of the stem of the question.
5. Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

AMPLIFICATION


1. In calculations, full credit must be given for a bold, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.
2. Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.
3. If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.
4. If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

QUALITY OF WRITTEN COMMUNICATION

Students will be assessed on their ability to:



- present relevant information in a form that suits its purpose
- ensure that spelling, punctuation and grammar are accurate, so that the meaning is clear
- use a suitable structure and style of writing.

Q1	(a)	A description to include two from : fast; random/haphazard motion/move freely; collisions (with walls/each other);	2
	(b)	speed would be less/slower or less/fewer collisions;	1
	(c)	lower the temperature of /cool the gas;	1
	(d)	a force / pressure;	1
		Total 5 marks	
Q2	(a)	in series; correct symbol—  —;	2
	(b) (i)	$V = IR$ [or $I = V/R$ or $R = V/I$] or 0.4×20 ; (but no marks for the “triangle” mnemonic)	1
	(ii)	0.4×20 ; 8 V ; (note the correct unit must be given)	2
	(c) (i)	points;; (note one mark lost for each incorrectly plotted point within a tolerance of one small square) curve; note: ignore a line drawn or continued outside the range of the readings	3
	(ii)	line which is always below the first curve;	1
		Total 9 marks	
Q3	(a)	no change in direction at first surface; correct reflection at second surface;	2
	(b)	red;	1
	(c) (i)	infra-red;	1
	(ii)	radio/tv;	1
	(d)	ticks in boxes 1,4,6 ;;;	3

- (e) A suggestion to include any two from:
 amount of diffraction depends on λ ;
 λ microwaves > λ X rays;
 need very small gap for X ray diffraction;
 could argue in terms of ratio λ/d ;

2

[Ignore references to frequency]

plus one communication mark for ensuring that spelling, punctuation and grammar are accurate so that the meaning is clear;

1

Total 11 marks

- Q4 (a) GM tube; 1
- (b) (i) background radiation (or any correct specific source of background radiation) ; 1
- (ii)
- | | type of ionising radiation | charge |
|----------|----------------------------|-------------------|
| source 1 | alpha; | positive; |
| source 2 | beta; | negative |
| source 3 | gamma | no charge; |
- 4
- (c) (i) 95; 1
- (ii) 146; 1
- (iii) A suggestion to include any two from:
 1. α short range;
 2. α easily stopped by smoke in air;
 3. α good ioniser;
 4. α absorbed by casing; 2

[Allow reverse argument in each case
 for example: β or γ would penetrate casing. Ignore references to dangers/safety]

Total 10 marks

- Q5 (a) (i) distance travelled;
 whilst thinking about action to take (owtte); 2
- (ii) $9/15 = 0.6$;
 $15/25 = 0.6$;
 $21/35 = 0.6$;
 [Allow reverse calculation in each case : eg $21 = 35 \times 0.6$] 3
- (iii) Any two from:
 drugs [named or in general and including alcohol] ;
 plausible distractions [example mobile phone use];
 driver characteristics [example age, medical condition];
 fatigue/tiredness; 2

- (b) (i) distance needed to bring car to a halt once brakes applied; 1
- (ii) **Either** an explanation in terms of energy to include two from: 2
1. car has more (kinetic) energy;
 2. more work has to be done by the brake;
 3. for constant / same force (this requires greater distance);
 4. takes more time to come to rest (so covers more distance)
- or an explanation in terms of force to include two from
1. force is same in each case/force remains constant;
 2. deceleration same in each case/remains constant;
 3. takes more time to come to rest (so covers more distance);

Total 10 marks

- Q6 (a) (i) An explanation to include: 1
- fossil fuels running out/non-renewable/cannot be replaced/take very long time to produce;
- (ii) Mention of two out of: 2
- global warming/greenhouse effect , acid rain, **smoke** pollution / smog;
A description of at least one of the above to include either the correct cause or a likely consequence;
- (b) (i) Two disadvantages from the following: 2
- ecological costs [eg loss of habitat]
limited locations [eg need river]
aesthetic [eg spoil the view]
variability [requires constant flow/ cannot react to change in demand] ;;
[Reject comparisons in terms of cost/ efficiency/ power output
also reject one-word answers]
- (ii) Two disadvantages from the following: 2
- ecological costs [eg bats/birds getting killed]
limited locations [eg needs large exposed area]
aesthetic [eg spoil the view/noise pollution]
variability [requires wind/ cannot react to change in demand] ;;
[Reject comparisons in terms of cost/ efficiency/ power output
Reject loss of agriculture
also reject one-word answers]
- (c) An explanation to include: 3
1. coil/wire or magnet/magnetic field;
 2. relative movement between coil and magnet;
 3. coil cuts magnetic field / magnetic field around coil changes;

Total 10 marks

- Q 7 (a) (i) $\frac{V_p}{V_s} = \frac{N_p}{N_s}$; [or clear equivalent] 1
 [Symbols or words must be used; not simply numbers]
- (ii) $\frac{230}{8} = \frac{N_p}{100}$;
 $N_p = 2875$; 2
- (b) (i) alternating current; 1
- (ii) diode/(bridge) rectifier; 1
 [Reject Light emitting diode]
- (c) (i) ($E = VIt$)
 $I = \frac{E}{Vt}$; (may be implied by numbers)
 $= \frac{150}{8 \times 300}$;
 $= 0.06(25) \text{ A}$; 3
 [Allow the $P = E/t$, then $I = P/V$ route]
- (ii) A suggestion to include any two from:
 1. current/charging rate decreases;
 2. as battery charges/fills up;
 3. accept unsmoothed voltage; 2
 [Reject answers that imply charging current is AC . For example current keeps on changing]

Total 10 marks

- Q 8 (a) Big bang; 1
- (b) (i) galaxy moving away (from Earth) / from each other; 1
- (ii) (recessional) speed/velocity of the galaxy; 1
- (c) **microwave** background radiation /in space/left over from the big bang; 1
- (d) thermal energy spreading out ; owtte 1
- (e) (i) Milky Way; 1
- (ii) An explanation to include any three from:
 1. pulled/collect together;
 2. by gravity;
 3. until hot enough/compressed enough;
 4. for fusion/ description of fusion; 3

communication mark for using a suitable structure and style of writing; 1

Total 10 marks

- Q9 (a) (i) the distance fallen increases;
in each 0.1s / in the same time interval; 2
- (ii) $5/0.1$;
50 (cm/s); 2
- (iii) $35/0.1 = 350$ (cm/s); 1
- (iv) acceleration = change in velocity/time;
 $300/0.3$;
 $= 1000\text{cm/s}^2$ or 10 m/s^2
[Allow ecf from (ii) and/or (iii)] 3
- (b) Any three from:
as it gets faster drag/air resistance increases;
resultant force decreases; 3
when drag = weight / forces are balanced/ resultant force zero;
reaches terminal/constant velocity;

Total 11 marks

- Q10 (a) $1/2mv^2$;
 $0.5 \times 1000 \times 625$;
312500J; 3
- (b) heat / thermal energy; 1
ignore sound
but **reject** answers that include any other form such as potential,
chemical etc.

Total 4 marks

TOTAL MARK 90