Mark Scheme (Results)

Summer 2007

GCSE Science B (1P/5647, 1P/5657, 4P/5648, 4P/5658)

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 <u>meaning</u> 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 total mark awarded for a question should be written in the box at the end of the question.

2.   The total marks for a question should 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 <u>bald</u>, 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 of a suitable structure and style of writing.

- use ✓c or Xc to show if the communication mark is given or not.

Mark Scheme

If there are two question numbers, the first refers to the Foundation tier paper and the second to the Higher tier paper.

1

gamma	Sterilising food...
ultrasound	Making images...
ultra-violet	Checking for fake...
X-ray	Scanning an unborn...

3

Total 3 marks

2   a   any 1 of
- (risk of) stated harm e.g. electrocution,shock,
- possibility of death/can kill you
- (risk of) fires/burns;

NOT JUST it will hurt you/it is dangerous/it sparks   **1**

    b   *mark as a 2 mark question*   **1**

one from----*this is not about* **sockets**   **1**
- fuse
- earth (lead/pin)
- rubber or plastic case/cable cover
- insulation (of wires/end of pins)
- cable grip/OWTTE

NOT 'rubber/plastic wires'

one from
- protects appliance from overheating/burning/catching fire
- prevents electrocution/ shocks/ death/
- prevents sticking fingers/screwdrivers/scissors in sockets
- stops loose wires

Total 3 marks

3   The diagram shows the orbits of some planets around the sun.
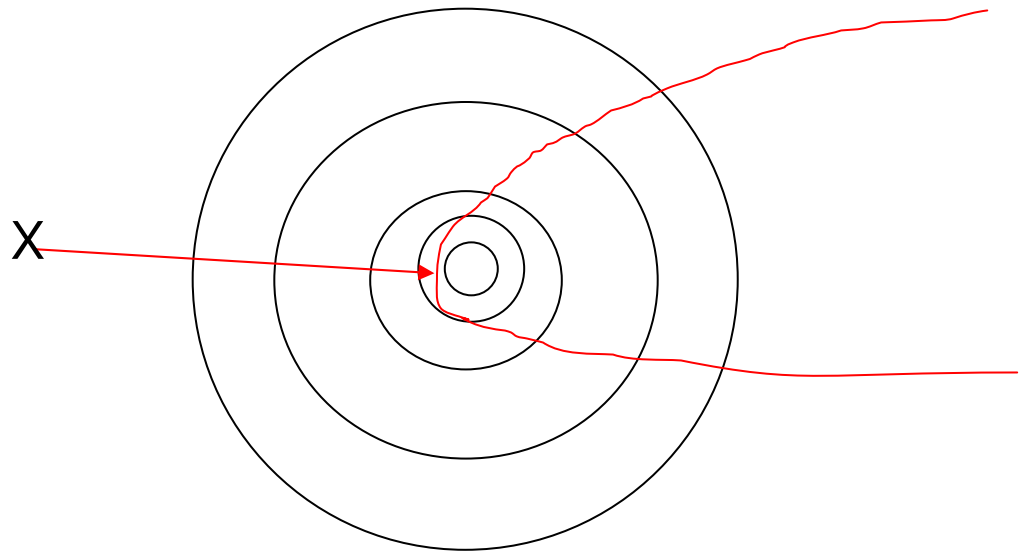
	a		any ellipse shape, need not show complete oval;	**1**
	b		X to be marked near the sun (Allow within the orbit of Venus);	**1**

Total 2 marks

4	a	i	*both needed for the 1 mark*	**1**

any suitable place with corresponding insulation;
- e.g. windows with double glazing/curtains,
- loft or roof with fibre glass/rockwool/cotton/thatching/foam etc
- walls with foam/expanded polystyrene/ fibreglass/ dry wall insulation
- doors with draught-proofing
- hot water tank with suitable jacket
- floors with carpets

		ii	reduces heat loss	**1**
	b		Advantage = any of	

- longer lifetime/ 12000hr
- less energy(or power) consumed/saves energy/(more) energy **1** efficient/(only uses)11W
- works out cheaper (in the long run)

accept any other sensible suggestion;
Disadvantage = takes longer to become bright/OWTTE **1**
accept any other sensible suggestion;
 NOT is less powerful

	c		3 x 7 x 4 ; substitution	**1**
			84 (p)/(£0.84) ; ans	**1**

unit if shown must be correct

Total 6 marks

5

2
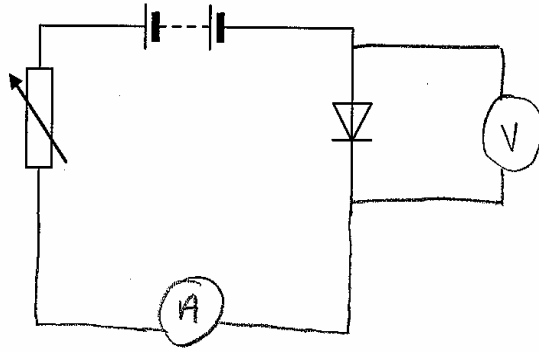
circuit must be complete and not shorted
ammeter correctly in series;
voltmeter <u>correctly in parallel over diode</u>;

Total 2 marks

6/ 1   a

Name	Mass in a.m.u.	Charge	Ionisation Ability
alpha		**<u>+2</u>**	
beta			**<u>medium</u> or <u>high</u>**
gamma	**none/zero/0** do not accept, almost 0 or negligible		

b   sensible suggestion;   e.g.   NOT   **1**
- protective clothing
- sealed containers
- (heavily) metal/concrete shielding
- secure area (safe area is insufficient)
- sent back to manufacturers/nuclear reactor
- (deep) burial
- in the ocean
- idea of vitrification
- down a subduction zone
- store until no longer dangerous

- rubbish/waste bin or bag
- burning
- well ventilated
- radioactive dump
- in the sewage
- in the sea unless qualified by 'deep'
- waiting until no longer dangerous

ANY wrong answer in a list NEGATES the mark

Total 4 marks

7/ 2   a   i   one from;   **1**
- to check whether life is possible
- to check whether life is possible
- to check whether life will be possible

5

- to see if humans can survive

allow water is the key to life

    ii   communication mark: uses a suitable structure and style of writing   **1**

QWC mark separate in the epen marking grid please

any 2 from;;   **2**

- conditions on Mars inhospitable
- conditions in space inhospitable
- health problems with humans/ORA robots
- cost/training
- supplies
- waste
- robots being more expendable/ORA
- length of time for journey
- other sensible suggestion

must be specific - no vague "its dangerous" etc

ignore 'Mars is too hot', 'Mars has no gravity'

    b   any one from;   **1**

listening/receiving/searching for (radio/microwave) signals

waiting for a response to signal

    c   Herschel = wrote letters/ published an article in a journal/spoke at a   **2**
scientific meeting;

Mike Brown = published on internet/phoned colleague or TV or radio
station/ wrote article for journal etc;

Total 7 marks

8/ 3   V= I x R ;   equation   **3**

(V =)5 x 2.4 ;   substitution

12(V) ;   ans, unit not essential, but if given must be correct

Allow **alternative** calcs   P = I x V;

                60=5XV;

                V=12(V);

Total 3 marks
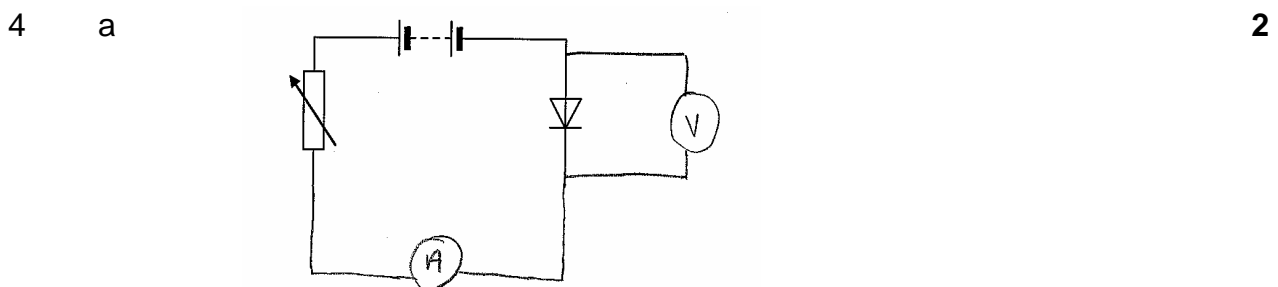
4   a   **2**

circuit must be complete and not shorted

ammeter correctly in series;
voltmeter correctly in parallel over diode;

    b   Labels and scale (at least one axis correct); units if given must be   **3**
correct and graph must occupy at least 33% of area given)
Points;(at least 6 correct)

Best fit line;

c   Reverse biased/ diode has very large resistance/ diode only   **1**
     conducts one way/ current can only flow in one way/OWTTE;

Total 6 marks

5   a   it will reduce her (heat) energy losses/OWTTE;   **1**
          accept prevent or stop for reduce
          (she will use less energy is **not** sufficient)
          check this Q for ans to part (b)
     b   any 2 from   **2**
          • it is made of a poor conductor/ORA
          • it traps pockets of air
          • air is an insulator
          • reduces convection
          • reduces conduction;;

Total 3 marks

6   a   current that changes *direction*;   **1**
          accept diagram e.g. a recognisable sine curve
          allow flow of electrons for current
     b   any 2 from   **2**
          • acts quickly/immediately
          • acts at any current value
          • sensitive to small current/detects difference in current in live
            and neutral
          • prevents fatal/serious shock
          • can be reset;;

Total 3 marks

7   a   i   transverse wave has vibration at right angles to wave direction but   **1**
               longitudinal wave has vibration in same direction as wave direction;
               (accept diagram)
          ii   ultra sound moves faster in patient than in air;   **1**
               accept changes speed
               NOT slower
     b   i   any 1 from;   **1**
               • if one generator used, E required would damage other parts of
                 patient
               • any one generator would not have sufficient E input to affect
                 gall stone
               • idea of focusing energy
               • idea of missing (vital) organs
          ii   any 1 from;   **1**
               • (stone absorbs E and) vibrates intensely/ with sufficient
                 amplitude or resonance idea
               • vibrates in several directions
               • accept cavitation idea

Total 4 marks
TOTAL FOR PAPER: 30 MARKS