Centre No.				Pape	r Refer	ence			Surname	Initial(s)
Candidate No.						/	4	P	Signature	

Paner Reference(s)

5648/4P 5658/4P

Edexcel GCSE

Science: Single Award B (1535)

Science: Double Award B (1536)

Physics B (1549)

(Modules 5 and 6)

Paper 4P

Higher Tier

Wednesday 6 June 2007 – Afternoon

Time: 30 minutes

Materials required for examination Ite

Items included with question papers

Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature, and complete the paper reference.

Check that you have the correct question paper.

Answer ALL the questions. Write your answers in the spaces provided in this question paper. Show all stages in any calculations and state the units. Calculators may be used. Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2). There are 7 questions in this question paper. The total mark for this paper is 30. There are 8 pages in this question paper. Any blank pages are indicated.

Advice to Candidates



This symbol shows where the quality of your written answer will also be assessed.

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Team Leader's use only

Examiner's use only

Turn over

Total



Leave blank

Answer ALL the questions. Write your answers in the spaces provided.

- **1.** Radioactive sources are used in hospitals to treat some patients. Radioactive sources can emit alpha, beta and gamma radiation.
 - (a) Complete the table to show the properties of the three types of radiation.

type of radiation	relative mass	charge	amount of ionisation produced
alpha particle	4		very high
beta particle	almost 0	-1	
gamma ray		0	low

(3)

(1)

(b)	Radioactive sources often remain dangerous after they have been used.
	Describe one way in which technicians in a hospital could deal with radioactive waste safely.
	Surely.

Q1

(Total 4 marks)

2. (a) NASA plans to send a robot lander called 'Phoenix' to Mars.



Source: www.nssdc.gsfc.nasa.gov

Phoenix is designed to search for water or ice.

		(1
	ice on Mars.	
(1)	Suggest a reason why NASA scientists want to find out if there is ar	ly water o
(i)	Suggest a reason why NASA scientists went to find out if there is an	w water a

(1)

One reason that they prefer to send robot landers rather than astronauts, is that people would need to exercise. Suggest two other reasons. (3) (b) Other scientists work for SETI (the Search for Extra-Terrestrial Intelligent life). State how these scientists search for extra-terrestrial life. (1) (c) In 1781, an astronomer named William Herschel discovered the planet Uranus. In 2005, Mike Brown discovered a tenth planet, code-named 2003UB313. Suggest how Herschel and Brown communicated their discoveries to other scientists throughout the world. William Herschel Mike Brown	One reason that they prefer to send robot landers rather than astronauts, is that people would need to exercise. Suggest two other reasons. (3) Other scientists work for SETI (the Search for Extra-Terrestrial Intelligent life). State how these scientists search for extra-terrestrial life. (1) In 1781, an astronomer named William Herschel discovered the planet Uranus. In 2005, Mike Brown discovered a tenth planet, code-named 2003UB313. Suggest how Herschel and Brown communicated their discoveries to other scientists throughout the world. William Herschel Mike Brown		(ii) NASA scientists do not plan to send people to Mars in the near future.		b
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Mike Brown	Mike Brown	(c)	In 2005, Mike Brown discovered a tenth planet, code-named 2003UB313. Suggest how Herschel and Brown communicated their discoveries to other scien	tists	
	(2) <u>Q</u>				
(2)			Mike Brown		
	(Total / Marks)				
			(Total 7 mai		Q
			(Total 7 mar		Q

3. A kettle for use in a caravan has this label.

Leave blank

- 5 A
- 60 W
- 2.4 Ω

Calculate the correct supply voltage for this kettle. Show your working.

.....

.....

Q3

(Total 3 marks)

4. (a) William investigates how the current varies with voltage in a diode. Complete the diagram to show how he should connect an ammeter and a voltmeter in the circuit.

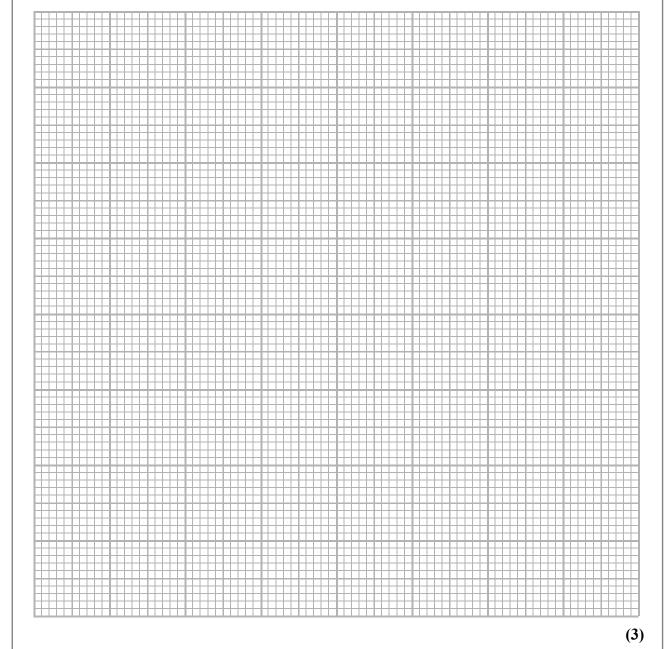


(2)

Leave blank

(b) These are the results that William recorded.Plot a graph of his results.You should include a line of best fit.

voltage (V)	-1.0	-0.5	0	0.5	1.0	1.5	2.0
current (mA)	0	0	0	0.2	3.5	14.0	24.5



(c)	Explain why the current is 0 A when the voltage is reversed.

		•	•	•	•			•	•	•	•	•	•			(1)

(Total 6 marks)

Q4

	(a)	Suggest how extra fibre glass in the loft would improve the energy efficiency of the house.	
((b)	Explain why fibre glass is a good insulator.	
		(2)	Q
		(Total 3 marks)	
N	Mai	ins appliances use alternating current.	
((a)	Explain what is meant by alternating current (a.c.).	
		(1)	
	(b)	Mains appliances can be made safer by using a fuse and an earth lead, or a residual current circuit breaker (RCCB) and double insulation.	
(Explain two advantages of using an RCCB instead of a fuse.	
(
(
(
(
((2)	Q

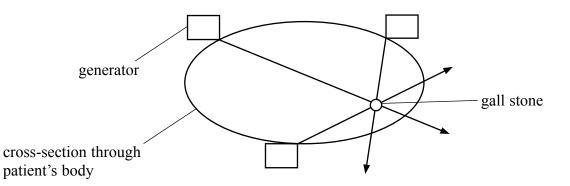
(a)		ctors can use ultrasound to locate a gall stone in a patient's body. rasound is a longitudinal wave.
	(i)	Explain the difference between a longitudinal and a transverse wave. You may draw a diagram if this helps your explanation.
		(1)
	(ii)	(1) When ultrasound enters a patient's body, the wave is refracted away from the normal. Explain why this occurs.

N 2 5 9 9 5 A 0 7 0 8

Leave blank

(b) Doctors can shatter a gall stone using ultrasound.

The diagram below shows how this can be achieved without harming the patient.



Using your knowledge of energy transfer,

- (i) suggest why the arrangement of generators shown in the diagram is used.

 (1)
- (ii) suggest why the gall stone shatters.

(1)

Q7

(Total 4 marks)

TOTAL FOR PAPER: 30 MARKS

END

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