Centre No.						Paper Reference (complete below)								Surname	Initial(s)
Candidate No.										F	/	1	F	Signature	

Paper Reference(s)

5020F/1F 5048F/1F

Edexcel GCSE

Additional Science (5020F)

Physics (5048F)

P2 – Topics 9 to 12

Foundation Tier

Wednesday 16 June 2010 – Morning

Time: 30 minutes

Materials required for examination
Calculator

Items included with question papers
Nil

Examiner's use only

Team Leader's use only

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
Total	

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.
Do not use pencil. Use blue or black ink.
Some questions must be answered with a cross in a box (☒). If you change your mind about an answer, put a line through the box (~~☒~~) and then mark your new answer with a cross (☒).
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 12 pages in this question paper. Any blank pages are indicated.

Advice to Candidates

You are reminded of the importance of clear English and careful presentation in your answers.

This publication may be reproduced only in accordance with Edexcel Limited copyright policy.
©2010 Edexcel Limited.

Printer's Log. No.
H36800A
W850/R1536/57570 5/4/6/2/

H 3 6 8 0 0 A 0 1 1 2

Turn over

edexcel
advancing learning, changing lives

FORMULAE

You may find the following formulae useful.

$$\text{average velocity} = \frac{\text{displacement}}{\text{time}} \qquad v = \frac{s}{t}$$

$$\text{acceleration} = \frac{\text{change in velocity}}{\text{time}} \qquad a = \frac{(v-u)}{t}$$

force = mass × acceleration $\qquad F = m \times a$

change in potential energy = mass × gravitational field strength × change in height $\qquad PE = m \times g \times h$

kinetic energy = ½ × mass × (velocity)^2 $\qquad KE = ½ \times m \times v^2$

electrical energy = voltage × current × time $\qquad E = V \times I \times t$

$$\text{power} = \frac{\text{work done}}{\text{time taken}} \qquad P = \frac{W}{t}$$

work done = force × distance moved in the direction of the force $\qquad W = F \times s$

Leave blank

1. Linda is driving her car.
She sees a traffic light turn red.
Her stopping distance equals her thinking distance plus braking distance.

(a) The thinking distances and braking distances will be affected by different factors.
Draw one straight line from each box on the left to the correct box on the right.

distances	**factors**
thinking distance	colour of the car
	condition of the tyres
braking distance	if the driver has been drinking alcohol
	whether the driver is male or female

(2)

(b) Complete the following sentence by putting a cross (☒) in the correct box.

The speed of the car will affect

- thinking distance only ☐
- braking distance only ☐
- both thinking distance and braking distance ☐

(1)

(c) Seat belts reduce the risk of injury in a car crash.

State one other safety feature used to reduce this risk of injury.
Explain how it works.

Safety feature .....

(1)

How it works .....

.....

.....

(1)

Q1

(Total 5 marks)

Leave blank

2. The photographs show two X-ray images.

image A taken in 1895

image B taken in 2009

Image A shows Wilhelm Röntgen's X-ray of his wife's hand taken just after the discovery of X-rays.
Image B shows a modern X-ray of a patient's foot.

(a) John says image B is better than image A.
Suggest why.

.....

.....

.....

(1)

(b) Soon after the discovery of X-rays, many different claims were made about their effects.

(i) Four of these claims are shown below.

X-rays can cure toothache.

X-rays…….
a treatment for cancer.

You can send your Valentine an X-ray of your heart.

Man says
"I no longer need to shave----
thanks to X-rays"

Which one of these claims is still being used today?

.....

.....

(1)

Leave blank

(ii) Another early claim was

> Baby has birthmark removed by X-rays.

The photograph shows an example of a birthmark.

1. Complete the following sentence by putting a cross (☒) in the correct box.

X-rays are unsuitable for removing birthmarks because

	waves	☒
they are	produced using high voltages	☒
	strongly ionising	☒

(1)

2. Explain the effect that X-rays can have on body tissue.

.....

.....

.....

.....

(2) **Q2**

(Total 5 marks)

Leave blank

3. George investigates static charges using balloons.
He rubs a balloon on a scarf.
The balloon becomes negatively charged.

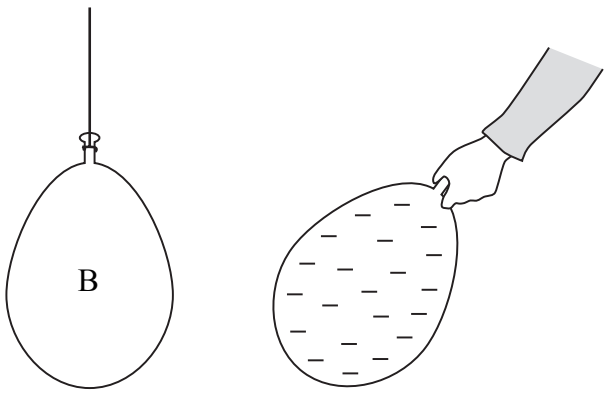
(a) Complete the following sentences by putting a cross (☒) in the correct boxes.

(i) The scarf	has become negatively charged	☒
	remains neutral	☒
	has become positively charged	☒

(ii) This is because	electrons have moved onto the balloon	☒
	electrons have moved onto the scarf	☒
	no charges have moved	☒
	protons have moved onto the balloon	☒
	protons have moved onto the scarf	☒

(2)

(b) George holds his negatively charged balloon near to another balloon, B, as shown in the diagram.



Balloon B could be negatively charged, neutral or positively charged.
Complete the table to show what would happen to balloon B in each case.
The first one has been done for you.

charge on balloon B	what would happen to balloon B when it is near the negatively charged balloon
positive	attracted and moves to the right
negative	
neutral	

(2)

Leave blank

(c) George knows that static electricity can be a problem in some situations and a help in others.

The table below shows some situations which involve static electricity.
Complete the table by placing a tick (✓) in the correct column for each situation.

situation	static electricity is a problem	static electricity is a help
lifting fingerprints from a surface		
T.V. screens		
photocopying		
removing dust from waste gases		
taking dry clothes out of a tumble drier		

(2)

(Total 6 marks)

Q3

Leave blank

4. The photograph shows a pirate boat ride in a theme park.
At the bottom of its swing, the pirate boat passes over a roller, which gives the boat a push.

(a) Friction between the roller and the boat gives the boat energy.
What happens to the movement of the boat as it gains energy?

.....

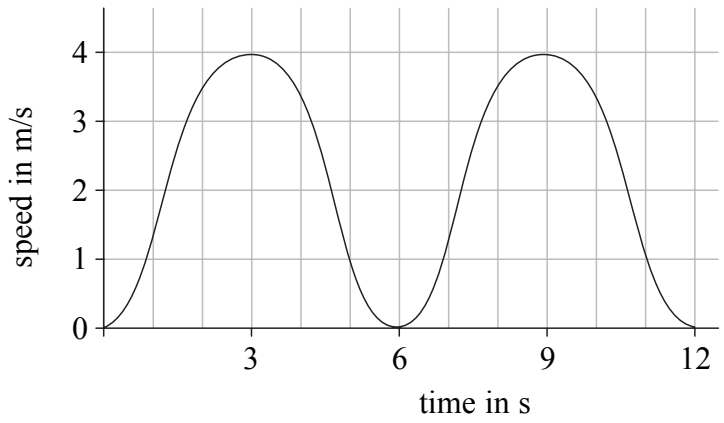
(1)

(b) The photograph shows the pirate boat at the top of its swing.
State the main form of energy that the pirate boat has gained by this point.

.....

(1)

(c) The roller is lowered and the boat swings freely.
The graph is a simplified speed-time graph for one complete swing of the pirate boat.



(i) State the maximum speed of the pirate boat during this swing.

.....

(1)

(ii) At what point of the swing does it reach maximum speed?

.....

.....

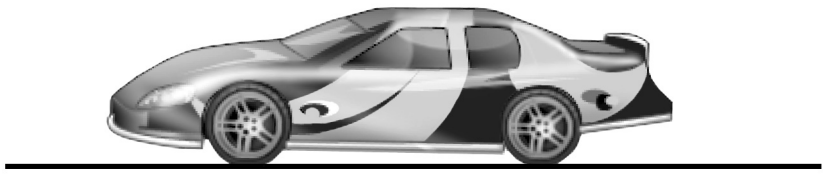
(1)

Q4

(Total 4 marks)

Leave blank

5.



The diagram shows a racing car accelerating from rest along a straight road.

The acceleration of the car is 8.4 m/s^2.
The mass of the car is 620 kg.

(a) Calculate the force needed to produce this acceleration.
State the unit.

Force = ...

(3)

(b) Explain why the force produced by the engine must be greater than the force calculated in (a).

.....

.....

.....

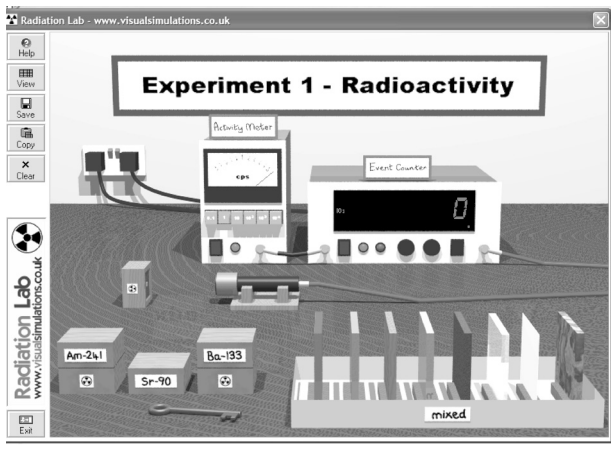
(1)

Q5

(Total 4 marks)

Leave blank

6. Ben used a computer simulation to investigate half-life.
The photograph shows a screenshot of the simulation he used.



(a) Suggest an advantage of using a computer simulation to investigate half-life rather than watching a demonstration.

.....

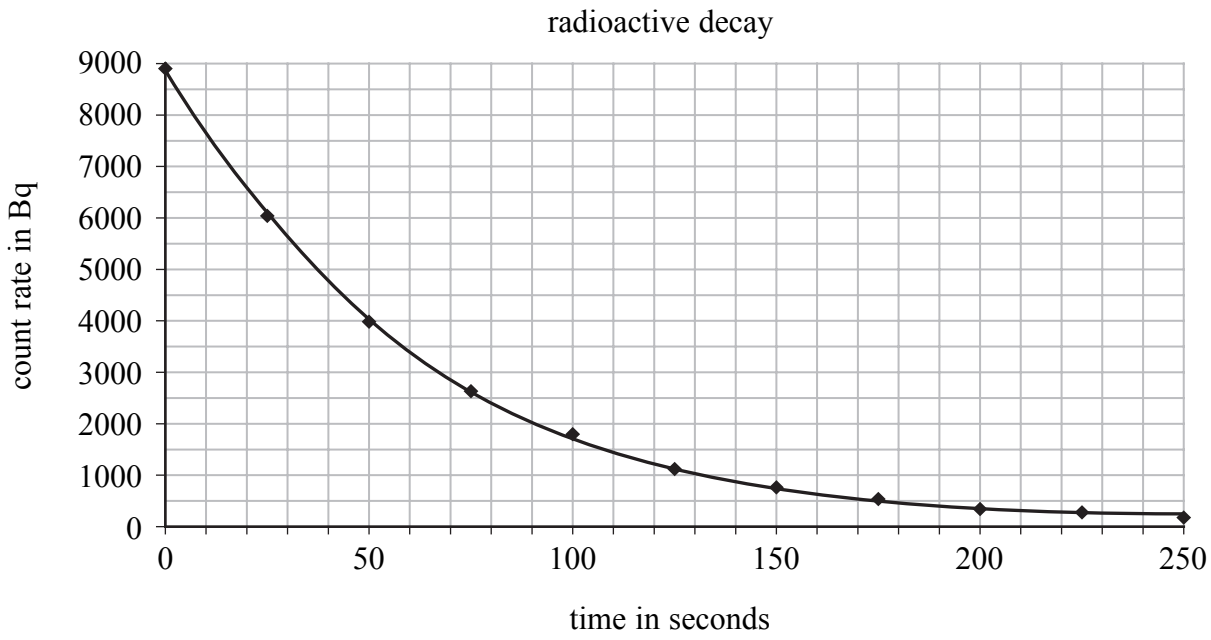
.....

.....

(1)

Leave blank

(b) Using data from the simulation, Ben produced the following graph. He can use it to calculate the half-life.



(i) Explain what is meant by **half-life**.

.....

.....

.....

(1)

(ii) Use Ben's graph to estimate the half-life.

half-life = ... seconds

(1)

Q6

(Total 3 marks)

Leave blank

7. Ben has made some fact cards to help him revise for a test on radioactivity.
Complete his fact cards correctly.

 ..... charge = ... ionising ability = high range in air = a few cm	 **beta** charge = –1 ionising ability = ... range in air = ...	 **gamma** charge = ... ionising ability = low range in air = ...

(3) **Q7**

(Total 3 marks)

TOTAL FOR PAPER: 30 MARKS

END