



Practice test

Physics Unit 1

Higher

Time: 25 minutes

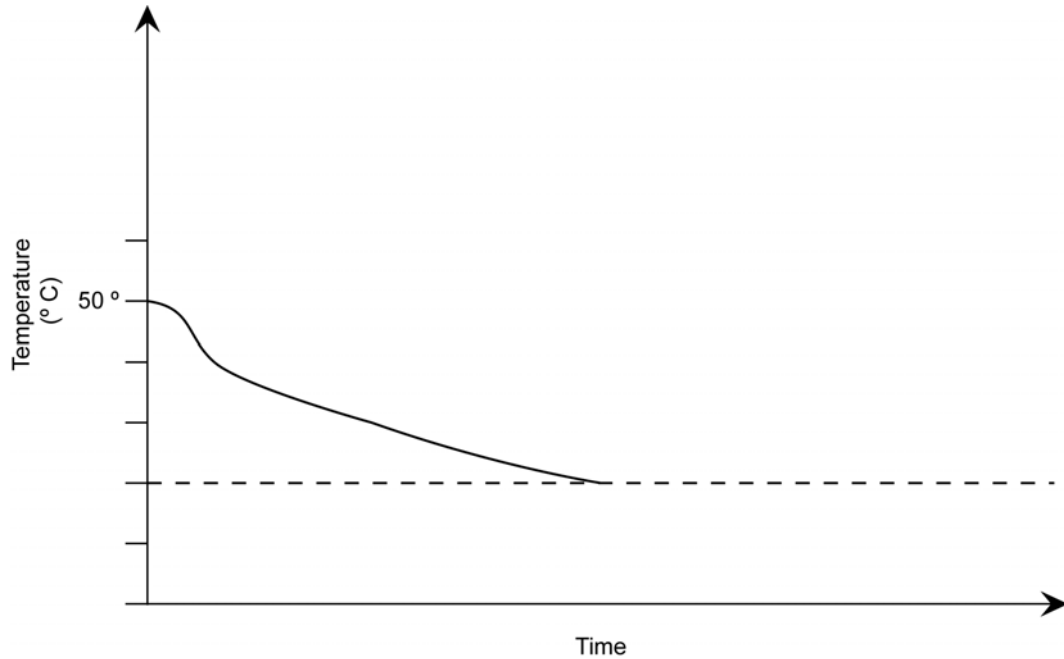
Name: _____

Form/teaching set: _____

Answer all of the questions.

Write your answers in the spaces provided on this paper.

- 1 A beaker contains 500 g of water at a temperature of 50 °C.
 The beaker is placed in a room which has a temperature of 20 °C.
 The graph shows what happens to the temperature of the water.



- a Explain why the curve is steepest at the start.

.....

[1]

- b How much energy does the water transfer to the room as it cools?
 The specific heat capacity of water is 4200 J/kg °C.

.....
 [2]

- c** The beaker is now placed in a freezer overnight.

Calculate the energy needed to melt all the ice when the beaker is placed back in the room at 20 °C.

The specific latent heat of water is 340 000 J/kg.

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[2]

Total marks: [5]

2 Many modern homes are insulated to reduce the amount of heat energy transferred to the surroundings. Older homes need to have insulation specially installed.

a Mr and Mrs Paul have installed three types of home insulation in their older home. The table shows the costs of the insulation and the annual saving they expect to make from each type.

Type of insulation	Cost of insulation	Annual saving	Payback time (years)
Double glazing	£5000	£100	
Loft insulation	£500	£25	
Reflective foil	£1500	£50	

i What is meant by the term 'payback time'?

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[1]

ii Complete the table to show the payback times for the three types of insulation.

[1]

b The house is supplied with on average 2000 J/s of heat energy. Before installation, on average 1100 J/s was transferred to the surroundings. After installation, the house is 30% more efficient at conserving the heat energy supplied. Calculate how much heat energy is transferred to the surroundings after installation.

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[3]

Total marks: [6]

- 3** Digital switchover is due to happen by 2012. Digital switchover is the name given to the process by which UK analogue broadcast television is converted to digital television.

The switchover started in October 2007 and is due to end in 2012.

The properties of digital signals played an important part in this decision.

- a** Describe the differences between analogue and digital signals.

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[1]

- b** Digital audio broadcasting (DAB) radios are becoming increasingly common. Many people are unhappy about the increase in DAB broadcasting and the reduction in traditional FM broadcasting.

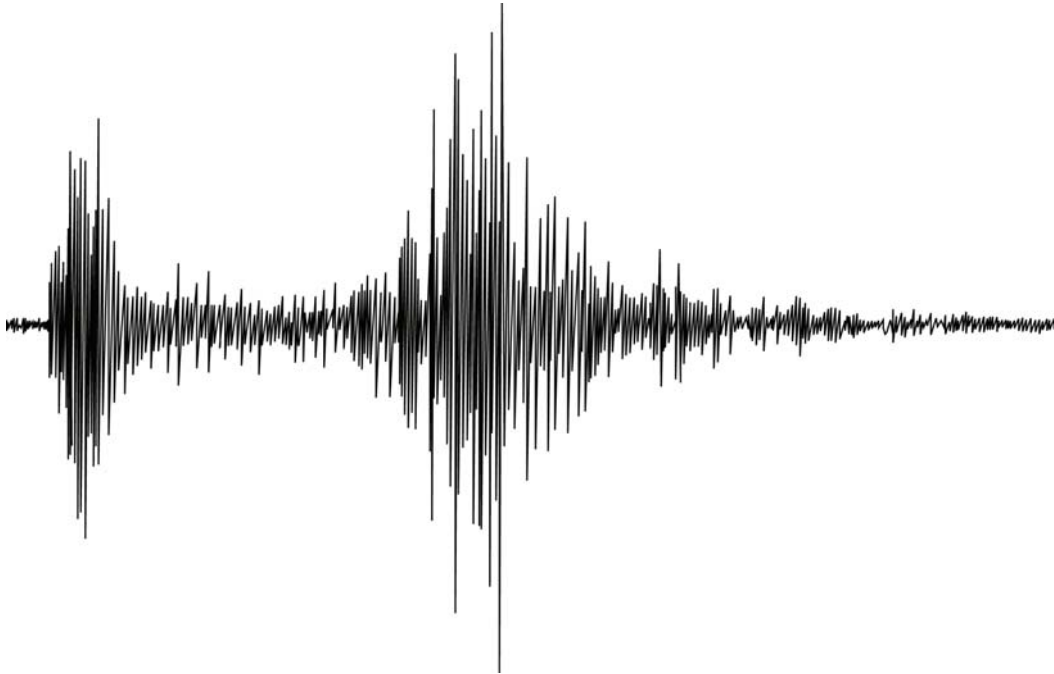
Outline the advantages and disadvantages of DAB compared with FM broadcasting.

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[2]

Total marks: [3]

- 4 When earthquakes happen, the shock waves that they send out are detected by a device called a seismometer. This device plots the waves to produce a seismograph.

This diagram shows an example of a seismograph.



- a Earthquakes produce two types of shock waves as shown on the graph.
i What are these two types of shock wave called?

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[1]

- ii Give two differences between them.

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[2]

- b** Explain how these shock waves can be used to provide evidence of the liquid outer core of the Earth.

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[3]

Total marks: [6]

- 5 When microwaves are used to transmit information to other parts of the Earth, the signal is sometimes lost or poorly received. Describe and explain how this signal loss may occur.

 The quality of written communication will be assessed in your answer to this question.

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Total marks: [6]

Paper total: [25]

END OF QUESTION PAPER