

Revision Sheet

Pearson Edexcel · International A-Level · Physics · Unit 2 Waves and Electricity

18 vocabulary items · 23 marks of exam questions (4 questions)

Part 1 · Vocabulary review (18 items). The terms this unit is examined on most. Mark it yourself from the answer key.

Section A · English dictation

Listen to each word and write it in English. The teacher reads the numbered answer key aloud.

1.

Dictation item 1.

[1]
2.

Dictation item 2.

[1]
3.

Dictation item 3.

[1]
4.

Dictation item 4.

[1]
5.

Dictation item 5.

[1]
6.

Dictation item 6.

[1]
7.

Dictation item 7.

[1]
8.

Dictation item 8.

[1]
9.

Dictation item 9.

[1]
10.

Dictation item 10.

[1]
11.

Dictation item 11.

[1]
12.

Dictation item 12.

[1]
13.

Dictation item 13.

[1]
14.

Dictation item 14.

[1]
15.

Dictation item 15.

[1]
16.

Dictation item 16.

[1]
17.

Dictation item 17.

[1]

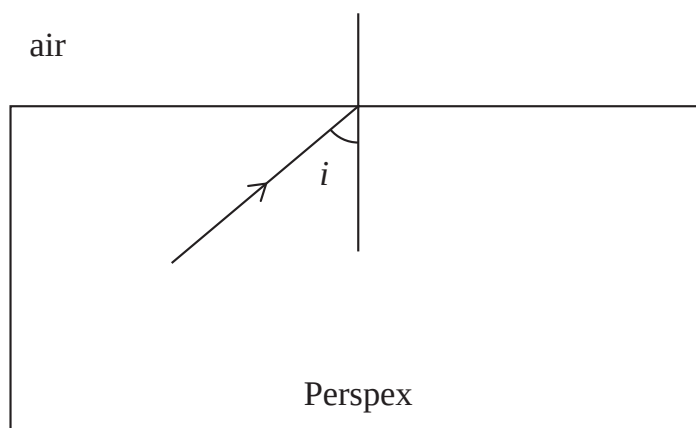
18. Dictation item 18.

[1]

Part 2 · Exam questions (23 marks, 4 questions) begins on the next page. They are ordered easy to difficult and none of them has been set before.

19 A ray of light is incident on the boundary between Perspex and air, as shown.

The angle of incidence i is greater than the critical angle for the Perspex-air boundary.

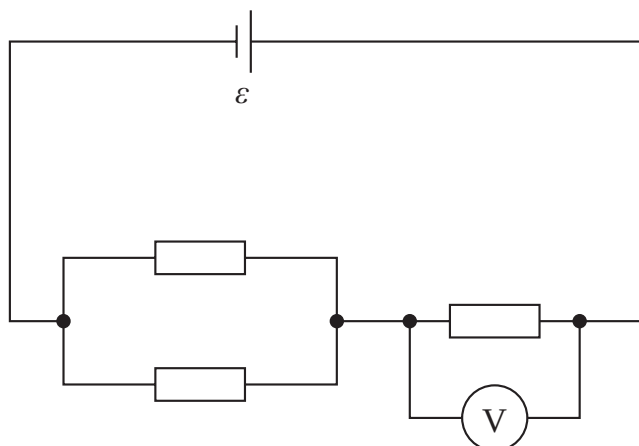
☐

Which of the following statements is correct for the Perspex-air boundary?

- ☐ **A** All the light is refracted.
- ☐ **B** All the light is transmitted.
- ☐ **C** All the light is reflected.
- ☐ **D** Some light is reflected and some light is refracted.

(Total for Question 19 = 1 mark)

20 A student connects three identical resistors in the circuit shown.



The cell has e.m.f. ϵ and negligible internal resistance.

Which of the following is equal to the reading on the voltmeter?

- ☒ **A** $\frac{\epsilon}{2}$
- ☒ **B** $\frac{\epsilon}{3}$
- ☒ **C** $\frac{2\epsilon}{3}$
- ☒ **D** $\frac{3\epsilon}{2}$

(Total for Question 20 = 1 mark)

21 A fishing boat uses a pulse-echo technique to determine the depth of fish under the water surface.

The boat has a transducer which emits pulses of sound into the water and detects returning pulses of sound.

(a) The transducer emits a pulse of sound and detects an echo from a fish after a time of 37 ms.

speed of sound in water = 1500 m s^{-1}

Calculate the distance between the transducer and the fish.

(3)

Distance = ...

(b) After each pulse is emitted by the transducer, there is a fixed time T before the next pulse is emitted.

Explain how T affects the maximum distance at which a fish can be detected.

(2)

(c) The transducer can emit pulses of sound waves of different frequency.

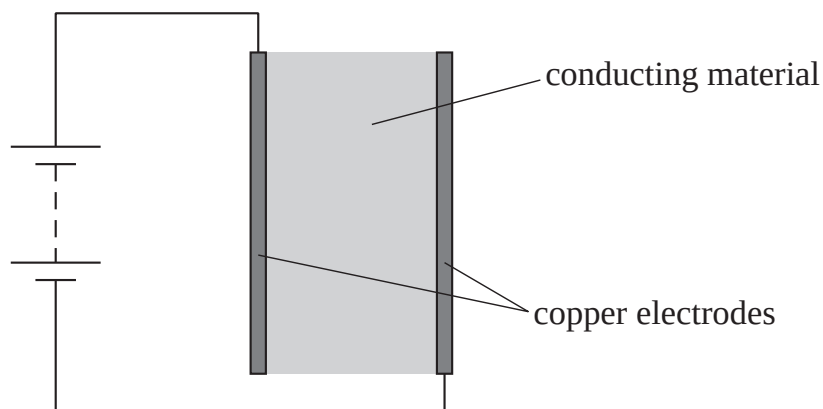
Explain how the frequency should be adjusted to improve the accuracy when detecting the location of a fish.

(2)

(Total for Question 21 = 7 marks)

22 An electrical heating system consists of heating panels.

Each panel is made from a thin sheet of conducting material attached to two copper electrodes. The electrodes are connected to a power supply, as shown.



(a) A student uses a sample of the conducting material to determine its resistivity.

(i) State what is meant by resistivity of a material.

(1)

(ii) Describe how the student could determine a value for the resistivity of the conducting material.

You do **not** need to draw a circuit diagram.

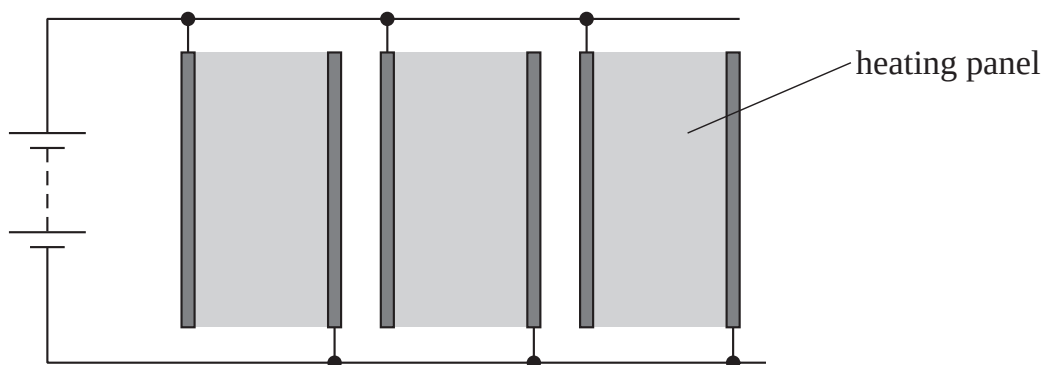
(4)

- (b) Copper has a low resistivity compared with the resistivity of the conducting material.

Explain how the low resistivity of copper affects the drift velocity of electrons in the copper electrodes.

(2)

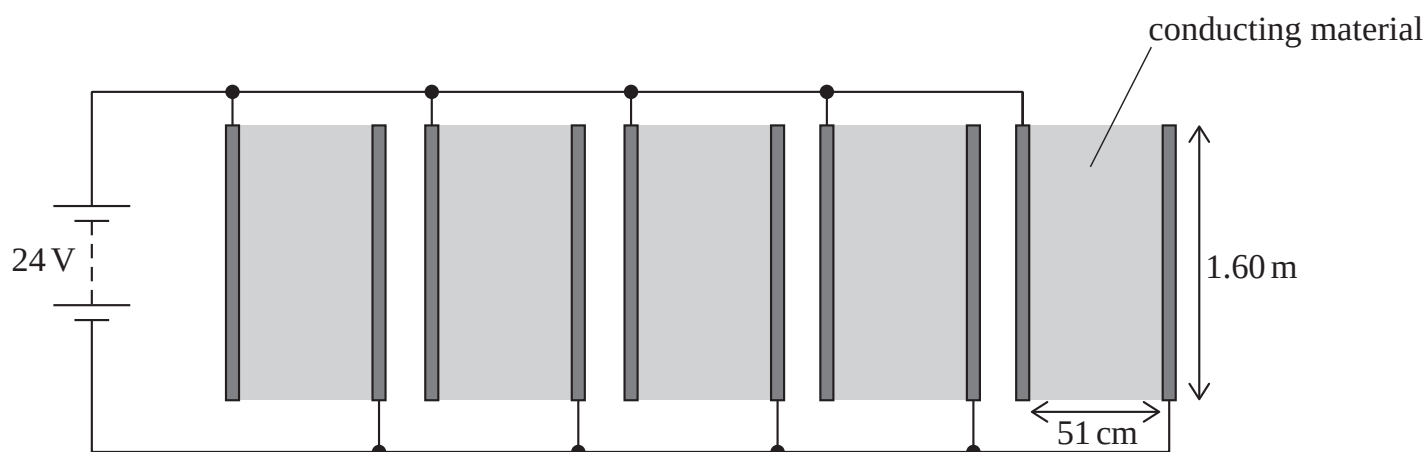
- (c) The power output of the heating system can be changed by connecting more panels in parallel with the power supply, as shown.



Explain how adding panels in parallel changes the power output of the system.

(2)

(d) A student designs a heating system using five heating panels, as shown.



To be safe, the maximum power of the student's heating system should be less than 350 W.

Deduce whether the student's heating system is safe.

resistivity of conducting material = $6.4 \times 10^{-3} \Omega \text{ m}$

thickness of conducting material = 0.48 mm

(5)

(Total for Question 22 = 14 marks)