

14.7 Diffraction

Name: _____ Class: _____ Date: _____

Total: 8 marks

KEY WORDS diffraction 衍射 • wave 波 • wavelength 波长

Objective

Build the skills to answer exam questions on **diffraction**.

You must be able to:

- describe **diffraction** 衍射 as the spreading of waves around obstacles and through gaps
- relate the amount of diffraction to the ratio of wavelength to gap size
- connect diffraction to the wave nature of light

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Diffraction

Waves **spread out** as they pass an obstacle's edge or go through a gap.

■ How much

Diffraction is greatest when the gap is **about the same size** as the wavelength. A gap much wider than λ gives little spreading.

■ Evidence for waves

Light diffracts through very narrow slits, which is direct evidence that light behaves as a wave.

2 Practice

2.1 State what diffraction is. [1]

2.2 State when diffraction through a gap is greatest. [1]

2.3 State what the diffraction of light shows about its nature. [1]

3 Exam-style questions

3.1 Diffraction is the _____ of waves around obstacles. [1]

- | | |
|---|---|
| A | B |
| C | D |
- A speeding up
 B spreading
 C reflection
 D absorption

3.2 Diffraction through a gap is greatest when the gap size is [1]

- | | |
|---|---|
| A | B |
| C | D |
- A much larger than the wavelength
 B about equal to the wavelength
 C zero
 D infinite

3.3 Water waves pass through a gap in a barrier.

(a) Describe what happens to the waves as they pass through. [1]

(b) State how to make them spread out more (for the same waves). [2]