

Splitting light, coloured filters, lenses and the eye

Grade 8 science (Year 9 · Class 8) · Test answers (mark scheme)

Use these model answers and marking notes to check your work. Award marks only for what is written, give credit for correct units in calculations, and note any colour or lens ideas you need to revise.

Level: Grade 8 science (Year 9 · Class 8) · **Curriculum:** MS-PS4-2

Question 1 White light and a prism (2 marks)

- a. A band of colours (a spectrum) from red to violet.
- b. Violet.

Marking: (a) 1 mark for spectrum of colours; (b) 1 mark for violet.

Question 2 Magenta filter (2 marks)

- a. Red and blue.
- b. Nothing emerges, because the filter absorbs green light.

Marking: (a) 1 mark for red and blue; (b) 1 mark for no light plus the reason that green is absorbed.

Question 3 Leaf in red light (3 marks)

- a. The leaf reflects green light and absorbs the other colours.
- b. Red light contains no green. The leaf absorbs the red light, so nothing is reflected to the eye and it looks black.

Marking: (a) 1 mark for reflects green; (b) 1 mark for absorbs red, 1 mark for no light reflected.

Question 4 Magnification (2 marks)

- a. $M = 9.6 \div 2.4 = 4.0$.
- b. Image height = $0.60 \times 5.0 = 3.0$ cm.

Marking: (a) 1 mark for 4.0; (b) 1 mark for 3.0 cm with unit.

Question 5 Parts of the eye (3 marks)

- a. The iris.
- b. The retina.
- c. The optic nerve.

Marking: 1 mark for each correct part.

Question 6 Image on the retina (2 marks)

The image is real and inverted (upside down). It is also much smaller than the tree.

Marking: 1 mark for real, 1 mark for inverted (smaller may be given as an extra detail).

Question 7 Reading a lens diagram (3 marks)

- a. A converging (convex) lens.
- b. The distance to P is 12 cm, so $f = 12$ cm.
- c. At point P, 12 cm from the lens.

Marking: (a) 1 mark; (b) 1 mark for 12 cm; (c) 1 mark for at P, the focal point.

Question 8 Object close to a lens (3 marks)

- a. The image is virtual, upright and larger.
- b. A virtual image forms where the rays only seem to come from, so the light does not actually meet at any point on a screen.
- c. A magnifying glass.

Marking: (a) 1 mark for virtual, upright and larger; (b) 1 mark; (c) 1 mark.