



Oxford Cambridge and RSA

## **GCSE Physics A (Gateway)**

**J249/04 Physics A P5-P8 and P9 (Higher Tier)**

### **Question Set 8**

1 A student investigates reflection and refraction of light rays.

(a) The student sends a ray of red light into a glass prism.

Fig. 1.1 shows the light ray as it leaves the glass prism.

On Fig. 1.1 complete the ray of light as it travels towards **and** through the glass prism.

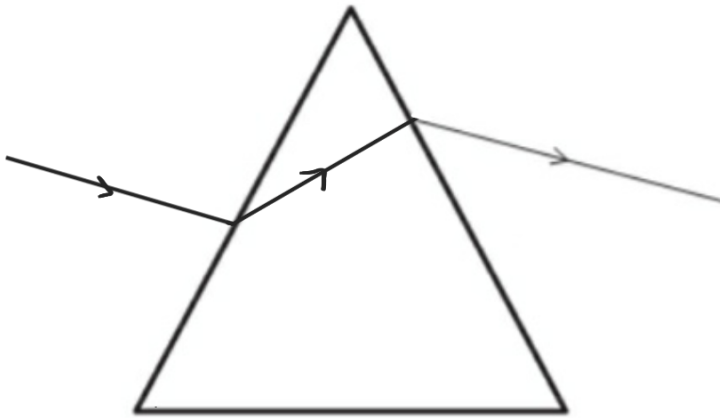


Fig. 1.1

[2]

(b) Fig. 1.2 shows two mirrors placed at  $90^\circ$  to each other.

A light ray hits one of the mirrors at  $45^\circ$ .

On Fig. 1.2 complete the ray of light as it reflects from both mirrors.

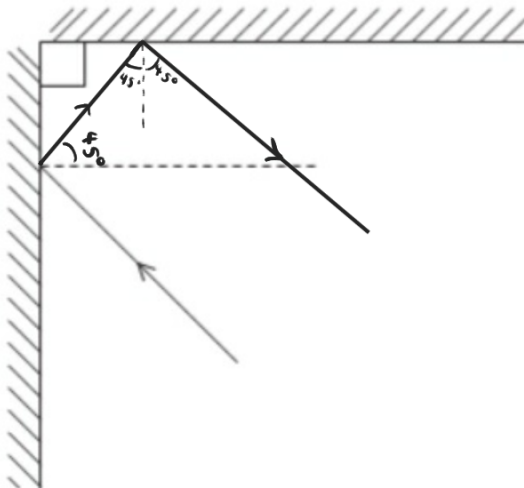


Fig. 1.2

[2]

(c) White light is made of different colours.

White light passes through a transparent filter X. Filter X absorbs green, blue, indigo and violet light.

The light then passes through another transparent filter Y, as shown in Fig. 1.3.

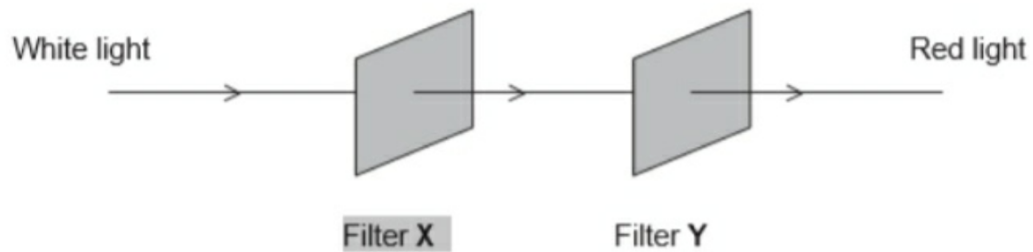


Fig. 1.3.

The light that leaves filter Y is red.

(i) What colours are transmitted by filter X?

Red, orange and yellow

[1]

(ii) What colours are absorbed by filter Y?

Orange and yellow

[1]

(d) A wall is painted red.

When some coloured lights shine on it, the wall appears black.

(i) Explain why.

As all of the colour is absorbed.  
No colour/light is reflected back.

[1]

(ii) Suggest **two** different colours of light that would cause the wall to appear black.

Green ..... and ..... Blue .....

[1]

- (e) An optician uses red and green light to test vision.

Fig. 1.4 is a ray diagram showing red light passing through a lens.

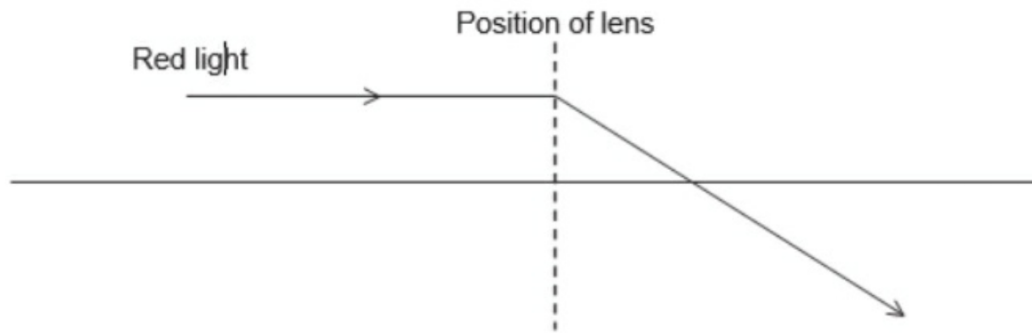


Fig. 1.4

- (i) Green light passes through the same lens as in Fig. 1.4.

Complete the ray diagram in Fig. 1.5 for green light. The focal point for red light  $F_R$  is shown.

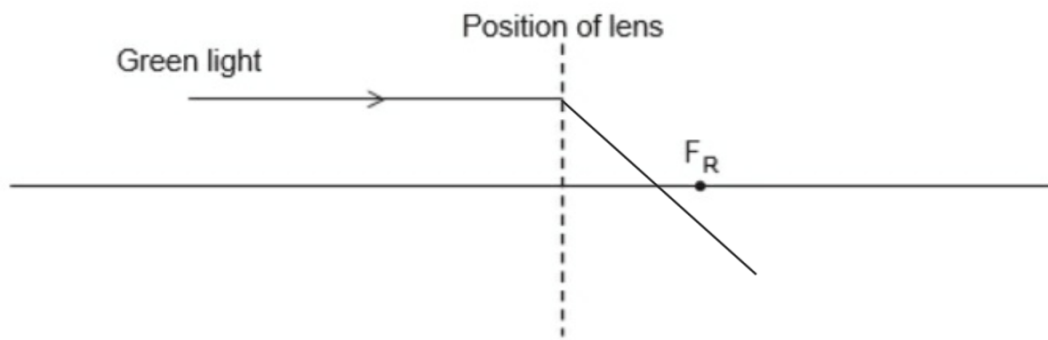


Fig. 1.5

[1]

- (ii) Explain your answer to (e)(i).

Green light has a shorter wavelength therefore refracts / bends more (by the lens).

[1]

(iii) Is the lens in Fig. 1.4 and 1.5 suitable for correcting long-sight or short-sight?

Tick (✓) **one** box.

Long-sight

Short-sight

Explain your answer.

Long sighted is corrected using a converging lens which starts to converge light rays from a nearby object before they enter the eye. [2]

**Total Marks for Question Set 8: 12**

Alters focal point so it no longer is beyond the retina. Instead focal point is on the retina.