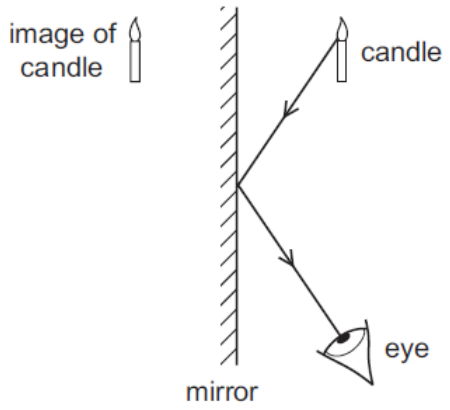
Light – 2020 IGCSE 0625

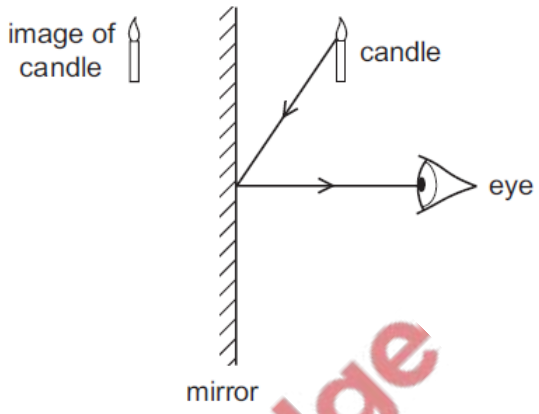
1. March/2020/Paper_12/No.23

Which diagram shows how the light from a candle is reflected by a mirror, and shows the position of the image formed?

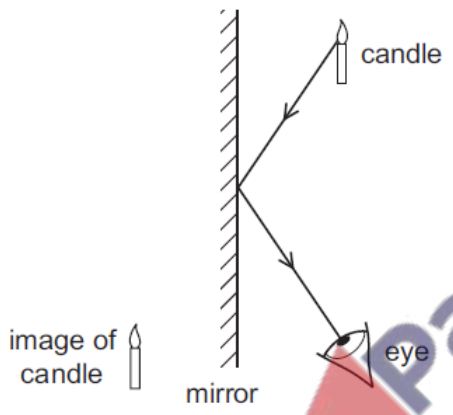
A



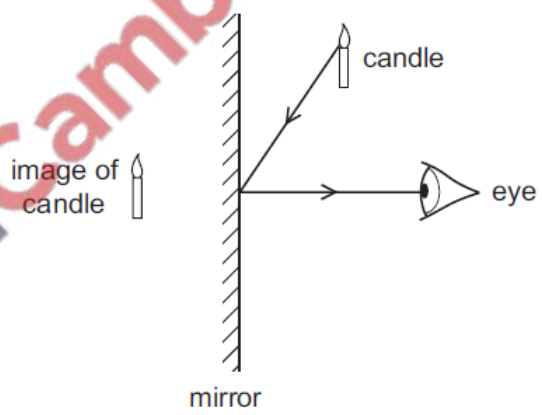
B



C

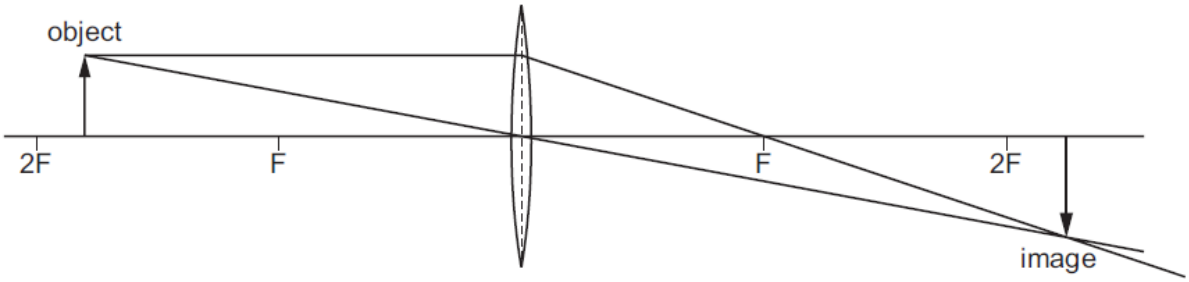


D



2. March/2020/Paper_12/No.24

The diagram shows an image being formed by a converging lens.



Which description of the image formed is correct?

A enlarged and inverted

B enlarged and upright

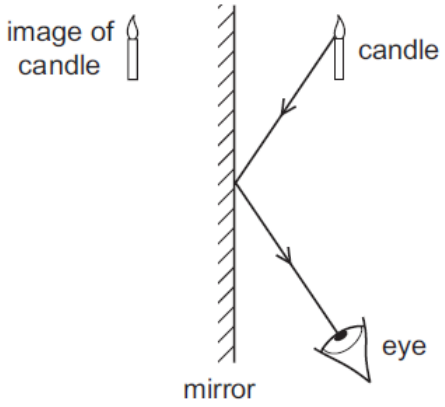
C diminished and inverted

D diminished and upright

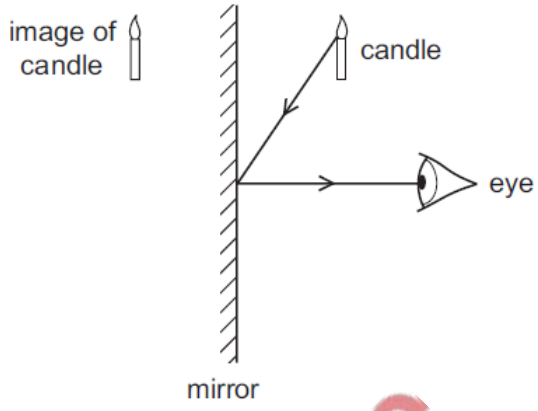
3. March/2020/Paper_22/No.25

Which diagram shows how the light from a candle is reflected by a mirror, and shows the position of the image formed?

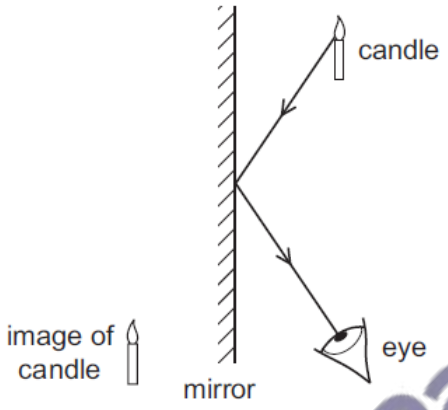
A



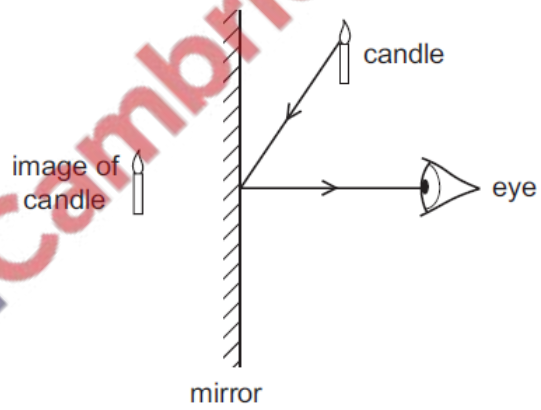
B



C



D



4. March/2020/Paper_22/No.26

A converging lens can be used as a magnifying glass.

What will be the nature of the image?

A real, inverted, diminished

B real, upright, enlarged

C virtual, inverted, enlarged

D virtual, upright, enlarged

5. March/2020/Paper_32/No.9

(a) Fig. 9.1 shows two rays of light X and Y leaving an object O. The rays strike a plane mirror. Ray X is reflected as shown.

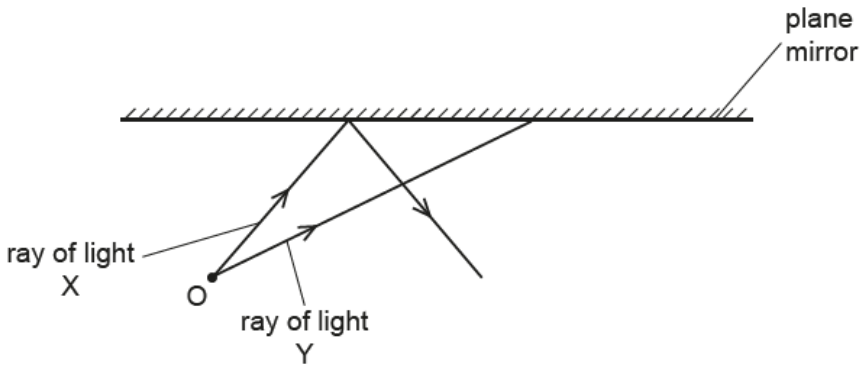


Fig. 9.1

(i) On Fig. 9.1, draw the normal at the point where ray X strikes the mirror. [1]

(ii) On Fig. 9.1, draw the path of ray Y after it strikes the mirror. [1]

(b) An object O is placed on the left of a thin converging lens. F is the principal focus.

This arrangement is shown in Fig. 9.2.

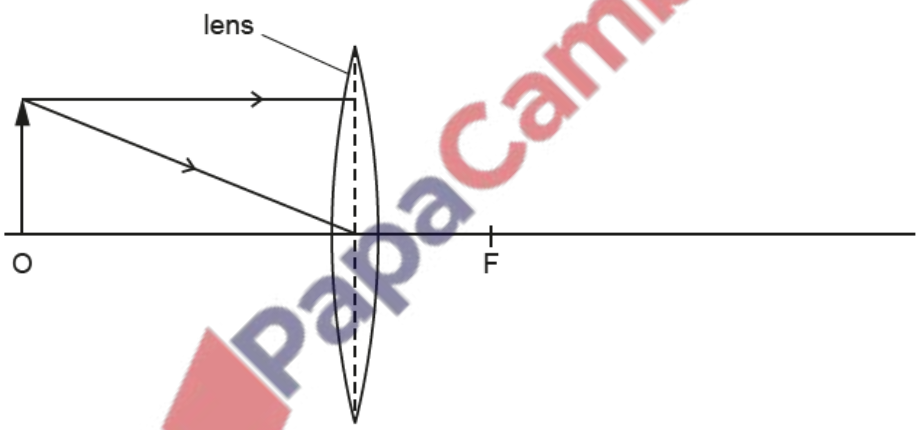


Fig. 9.2

Two rays from the top of the object are incident on the lens, as shown in Fig. 9.2.

On Fig. 9.2, draw the path of each ray to locate the position of the image of O formed by the lens.

On Fig. 9.2, draw an arrow to represent the image and label it I.

[3]

[Total: 5]

6. March/2020/Paper_42/No.7

(a) Fig. 7.1 shows a converging lens and the image I formed when an object is placed to the left of the lens. The principal focuses are labelled A and B and the centre of the lens is labelled C.

(i) On Fig. 7.1, draw two rays to locate the position of the object.
Draw the object and label it O.

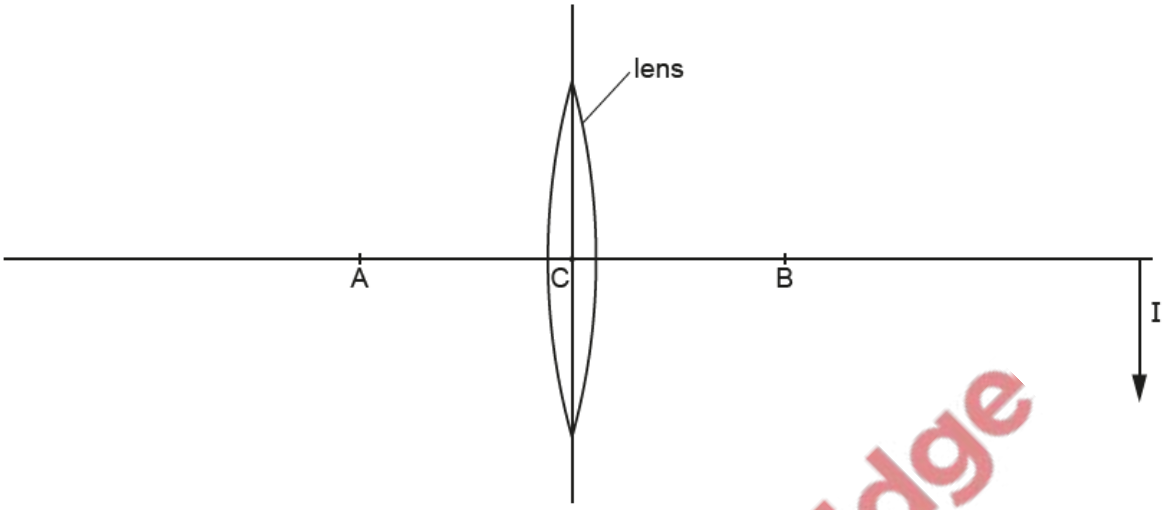


Fig. 7.1

[3]

(ii) Ring all of the following distances that are equal to the focal length of the lens.

AB AC CB 2AB

[2]

(b) Fig. 7.2 shows green light passing through a triangular glass block.

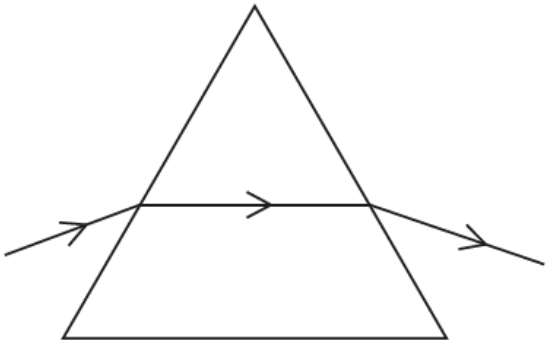


Fig. 7.2

Red light enters the triangular glass block shown in Fig. 7.2 along the same path as the green light.

(i) On Fig. 7.2, draw the path of the red light within the triangular glass block. [1]

Fig. 7.3 shows green light passing through a rectangular glass block.

Red light enters the rectangular glass block shown in Fig. 7.3 along the same path as the green light.

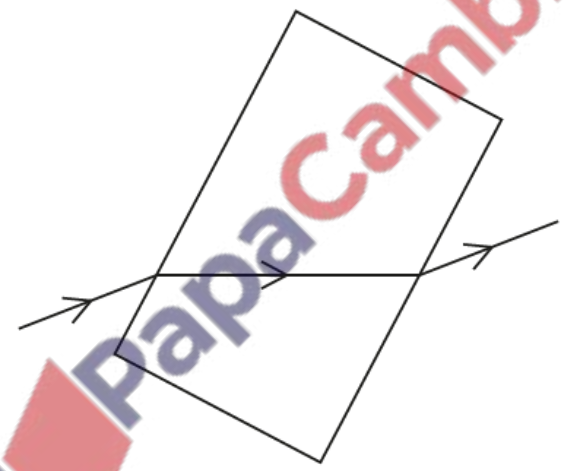


Fig. 7.3

On Fig. 7.3:

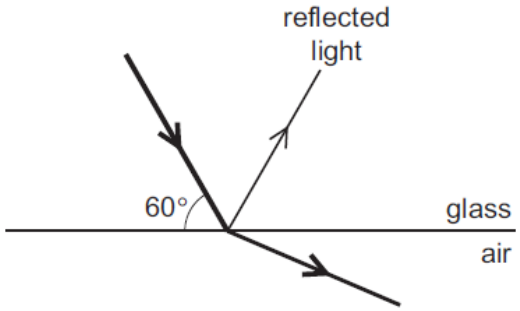
(ii) draw the path of the red light within the rectangular glass block [1]

(iii) draw the path of the red light after leaving the rectangular glass block. [1]

[Total: 8]

7. June/2020/Paper_11/No.23

The diagram shows a beam of light travelling through glass and meeting a glass-air interface.

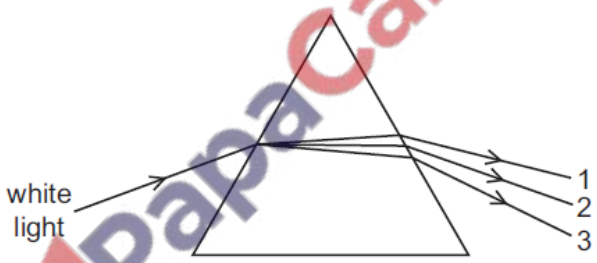


Which row correctly describes what is happening at the glass-air interface?

	angle of incidence at the interface	observation
A	30°	some internal reflection
B	30°	total internal reflection
C	60°	some internal reflection
D	60°	total internal reflection

8. June/2020/Paper_11/No.24

A narrow beam of white light passes through a prism and is dispersed into a spectrum.

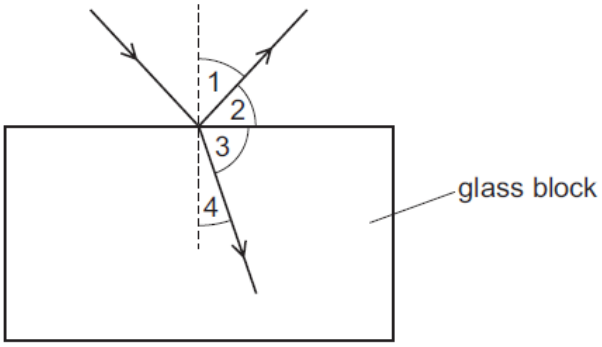


Which row is correct?

	colour 1	colour 2	colour 3
A	blue	yellow	red
B	red	blue	yellow
C	red	yellow	blue
D	yellow	blue	red

9. June/2020/Paper_12/No.23

The diagram shows a ray of light incident on the surface of a glass block.



The ray of light is partially reflected back into the air and partially refracted into the glass block.

Which row correctly identifies the angle of reflection and the angle of refraction?

	angle of reflection	angle of refraction
A	1	3
B	1	4
C	2	3
D	2	4

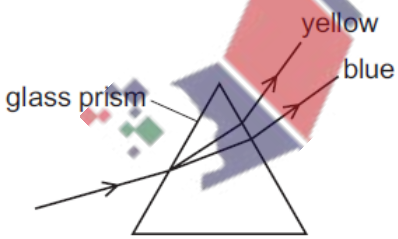
10. June/2020/Paper_12/No.24

A beam of light consists of yellow and blue light.

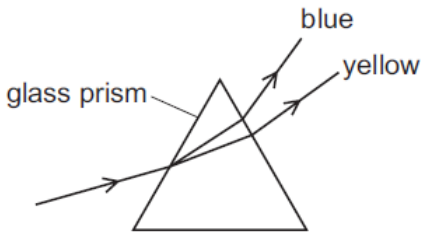
The beam of light is incident on a glass prism.

Which diagram is correct?

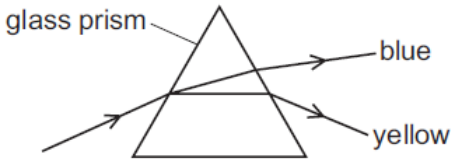
A



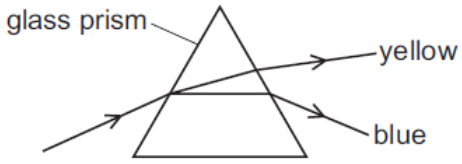
B



C

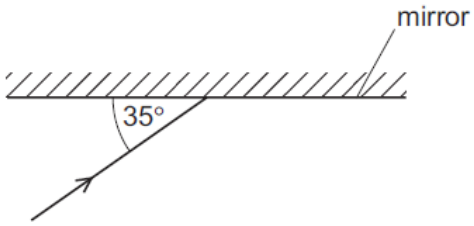


D



11. June/2020/Paper_13/No.23

The diagram shows a ray of light incident on a plane mirror.



The angle between the ray and the mirror is 35°.

The ray is reflected by the mirror.

What is the angle of reflection?

A 35° **B** 55° **C** 70° **D** 110°

12. June/2020/Paper_13/No.24

A beam of white light is split into a spectrum of seven colours.

Which name is given to this process?

A diffraction

B dispersion

C reflection

D refraction

13. June/2020/Paper_21/No.22

Which statement is correct?

A The speed of light in glass is equal to the speed of light in a vacuum multiplied by the refractive index of glass.

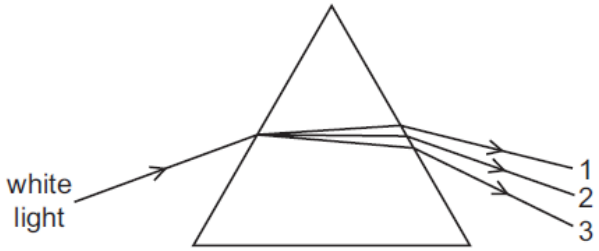
B The incident angle of a light ray at an air-glass surface is the angle between the ray and the glass surface.

C The sine of the critical angle at an air-glass surface is equal to $\frac{1}{\text{refractive index of glass}}$.

D The angle of refraction for light passing through an air-glass surface is proportional to the angle of incidence at that surface.

14. June/2020/Paper_21/No.23

A narrow beam of white light passes through a prism and is dispersed into a spectrum.

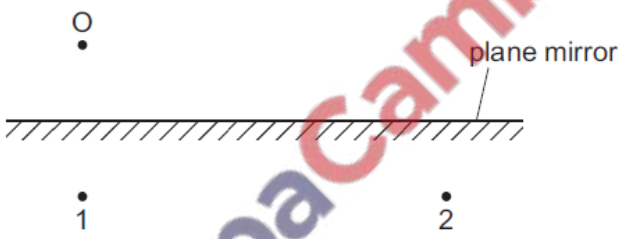


Which row is correct?

	colour 1	colour 2	colour 3
A	blue	yellow	red
B	red	blue	yellow
C	red	yellow	blue
D	yellow	blue	red

15. June/2020/Paper_22/No.22

An object O is placed in front of a plane mirror as shown.



Which row is correct?

	position of the image	nature of the image
A	1	real
B	1	virtual
C	2	real
D	2	virtual

16. June/2020/Paper_22/No.23

Which statement is correct?

A The speed of light in glass is equal to the speed of light in a vacuum multiplied by the refractive index of glass.

B The incident angle of a light ray at an air-glass surface is the angle between the ray and the glass surface.

C The sine of the critical angle at an air-glass surface is equal to $\frac{1}{\text{refractive index of glass}}$.

D The angle of refraction for light passing through an air-glass surface is proportional to the angle of incidence at that surface.

17. June/2020/Paper_23/No.22

Which statement is correct?

A The speed of light in glass is equal to the speed of light in a vacuum multiplied by the refractive index of glass.

B The incident angle of a light ray at an air-glass surface is the angle between the ray and the glass surface.

C The sine of the critical angle at an air-glass surface is equal to $\frac{1}{\text{refractive index of glass}}$.

D The angle of refraction for light passing through an air-glass surface is proportional to the angle of incidence at that surface.

18. June/2020/Paper_23/No.23

Which statement about converging lenses is correct?

A A real image of an object projected onto a screen by a converging lens is always inverted.

B The image formed by a converging lens is always upright.

C The image formed by a converging lens when used as a magnifying glass is a real image.

D Parallel rays entering a converging lens are focused at a distance greater than the focal length from the lens.

19. June/2020/Paper_31/No.7

(a) Fig. 7.1 shows a ray of light striking a plane mirror at point P.

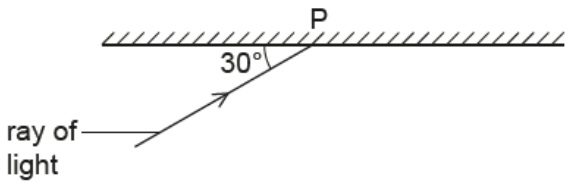


Fig. 7.1 (not to scale)

(i) Determine the value of the angle of incidence for the ray of light at point P.

angle of incidence = ... ° [1]

(ii) On Fig. 7.1,

- draw a normal at point P
- draw the ray reflected at point P
- determine the angle of reflection at point P.

angle of reflection = ... ° [3]

(b) Fig. 7.2 shows an object OB positioned 20 cm from a thin converging lens. Both principal focuses of the lens are labelled F.

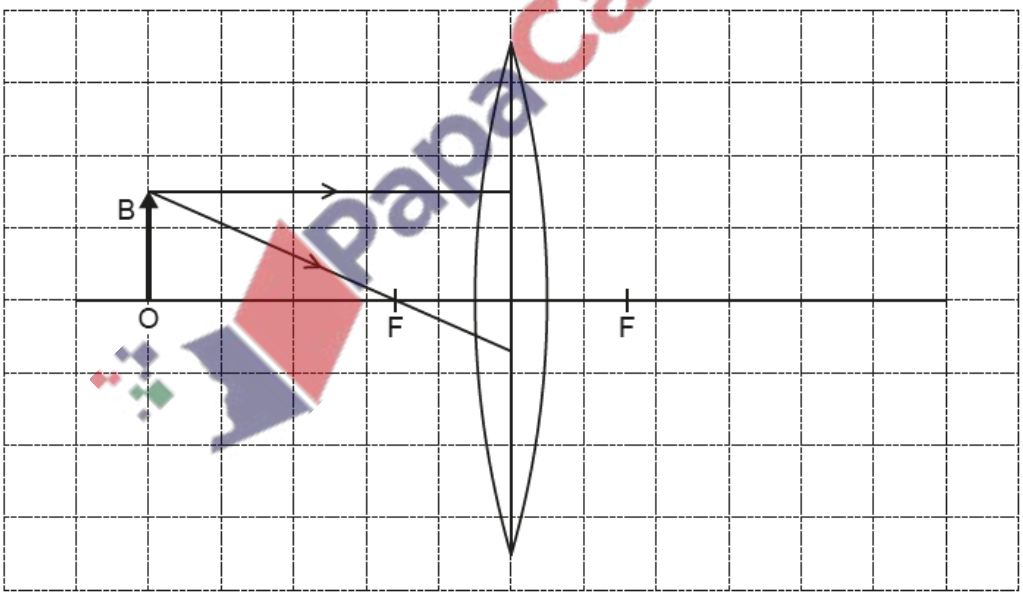


Fig. 7.2

Two rays from the tip B of the object are incident on the lens, as shown in Fig. 7.2.

On Fig. 7.2, continue the paths of these two rays to show the position of the image of OB formed by the lens. Draw an arrow to show the size, position and orientation of the image of OB. [4]

[Total: 8]

20. June/2020/Paper_32/No.5

Fig. 5.1 shows a ray of red light passing through a semicircular glass block.

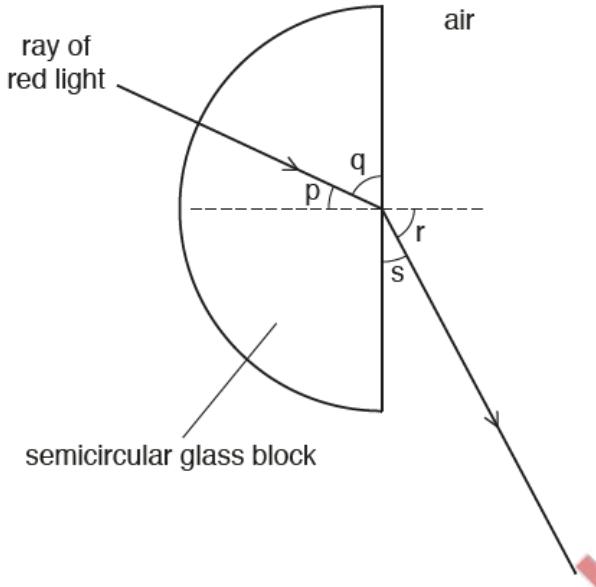


Fig. 5.1

(a) (i) State the term for the dotted line shown in Fig. 5.1.

..... [1]

(ii) State which angle p, q, r or s is the angle of incidence for the ray of red light.

..... [1]

(iii) State which angle p, q, r or s is the angle of refraction.

..... [1]

(iv) State what happens to the speed of the red light as it enters the semicircular glass block from the air.

..... [1]

(b) Fig. 5.2 shows the path of a ray of light entering a semicircular glass block. The critical angle for the glass block is 42°.

On Fig. 5.2, continue the path of the ray. Show clearly its direction on leaving the glass block.

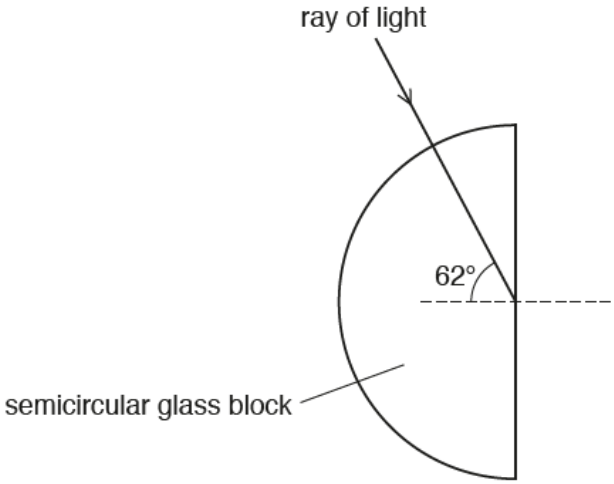


Fig. 5.2

[2]

(c) A ray of white light passes through two prisms as shown in Fig. 5.3.

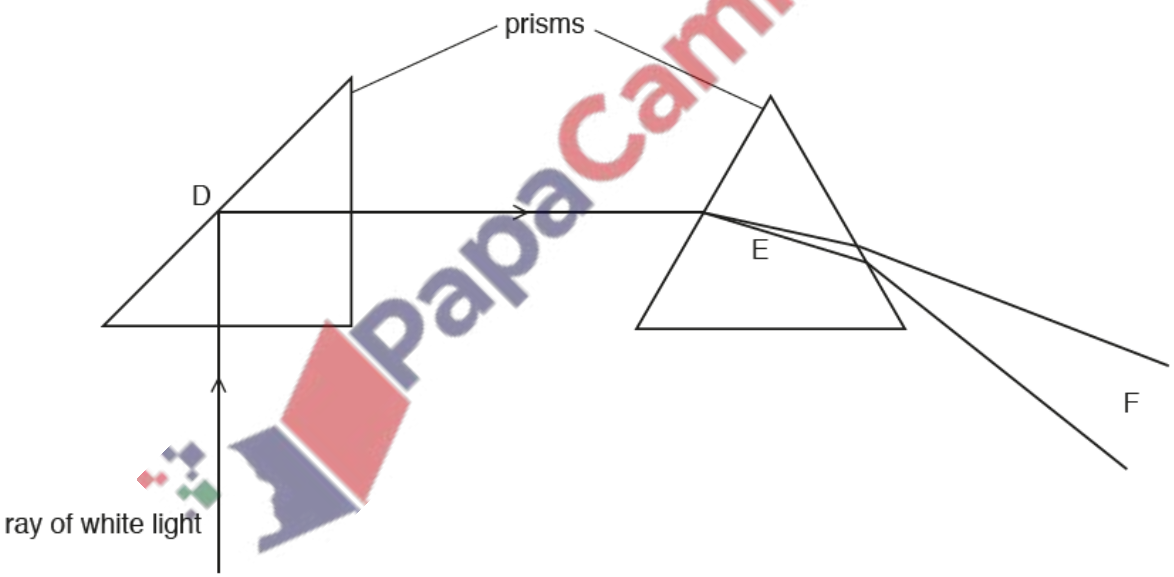


Fig. 5.3

Draw **one** line to link the letter for each position to the correct effect at that position.

position	effect
(i)	
	refraction
D	diffraction
	total internal reflection

[1]

(ii)	
	reflection
E	dispersion
	diffraction

[1]

(iii)	
	red, green and blue light only produced
F	white light produced
	spectrum of visible light produced

[1]

[Total: 9]

21. June/2020/Paper_41/No.5

The distance between the centre of a thin converging lens and each principal focus is 5.0 cm.

(a) Describe what is meant by the term *principal focus* for a thin converging lens.

.....

.....

..... [2]

(b) The lens is used as a magnifying glass to produce an image I of an object O.

(i) Underline the terms that describe the nature of the image produced by a magnifying glass. [2]

diminished **enlarged** **inverted** **real** **same size** **upright** **virtual**

(ii) Fig. 5.1 is a full-scale diagram of the lens and the image I.

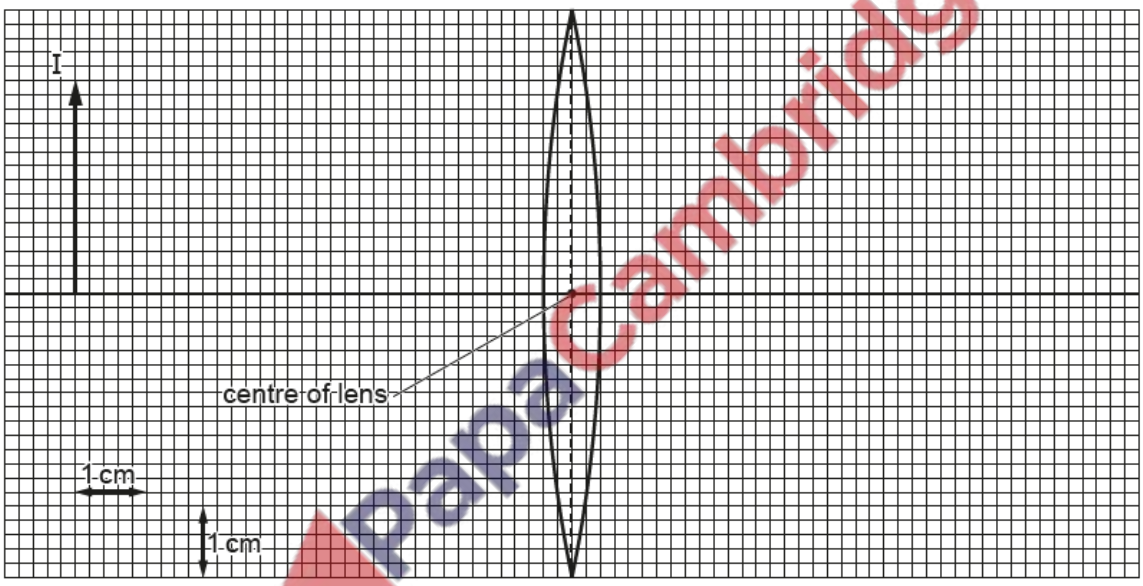


Fig. 5.1 (full-scale)

1. On Fig. 5.1, mark both principal focuses and label each of them F. [1]

2. By drawing on Fig. 5.1, find the position of object O and add object O to the diagram. [3]

(iii) Using Fig. 5.1, determine the distance of object O from the centre of the lens.

distance = ... [1]

[Total: 9]

22. June/2020/Paper_42/No.7

(a) A student makes a transformer that uses an alternating current (a.c.) supply with an electromotive force (e.m.f.) of 12.0 V to induce an output potential difference (p.d.) of 2.0 V.

The student is provided with two lengths of insulated wire and the U-shaped piece of iron shown in Fig. 7.1.

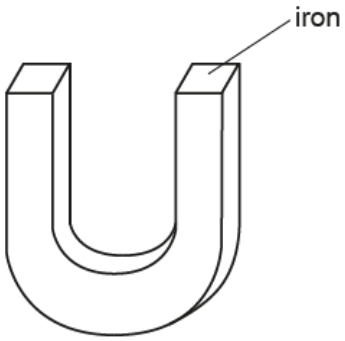


Fig. 7.1

(i) Complete and label Fig. 7.1 to show the transformer connected to the supply and the output from the transformer. [3]

(ii) Explain the function of the piece of iron in the transformer.

.....

.....

..... [2]

(iii) The output of the transformer is connected to a lamp. The current in the lamp is 100 mA. The transformer is 100% efficient.

Calculate the input current to the transformer.

current = ... [2]

(b) Another transformer is used in a school laboratory to step down a mains supply with a p.d. of 110 V to 12 V. This transformer is mounted in a metal case.

State and explain an essential safety feature required for this arrangement.

.....

..... [2]

[Total: 9]

23. June/2020/Paper_43/No.7

Fig. 7.1 shows red light travelling from air into a prism made of diamond. The path of the red light is incomplete.

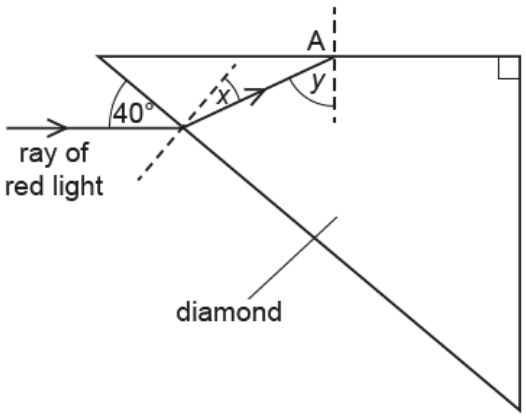


Fig. 7.1 (not to scale)

(a) The refractive index of diamond is 2.42.

Calculate angle *x*.

angle *x* = ... [2]

(b) Explain the term *total internal reflection*.

.....

.....

.....

.....

..... [3]

(c) The angle *y* is greater than the critical angle of diamond.

On Fig. 7.1, draw the path of the red light through and out of the prism after point A. [2]

[Total: 7]