Unit 15 Light, colours and beyond

A Multiple-choice questions

1. B
2. C
3. D
4. A
5. A
6. D
7. D
8. B
9. D
10. B

B True or false questions

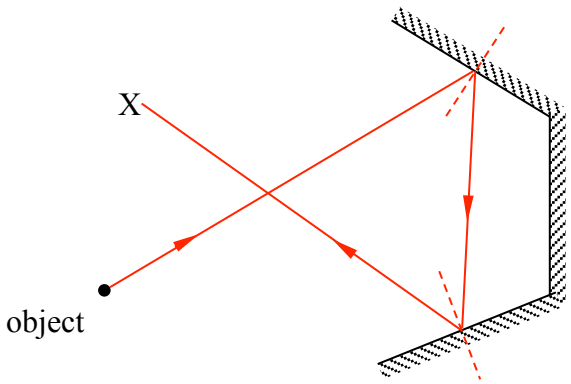
1. F
2. T
3. T
4. T
5. F

C Fill-in-the-blanks

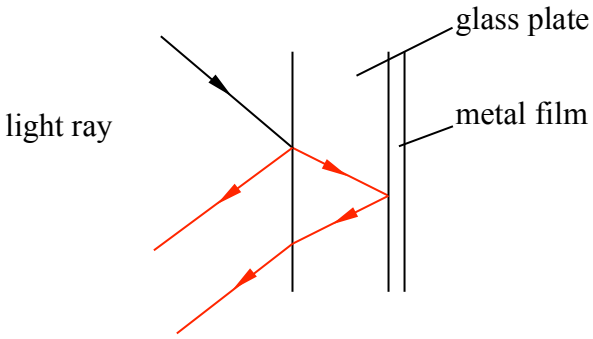
1. laterally inverted, size
2. total internal reflections
3. cyan
4. infra-red
5. wavelength

D Short questions

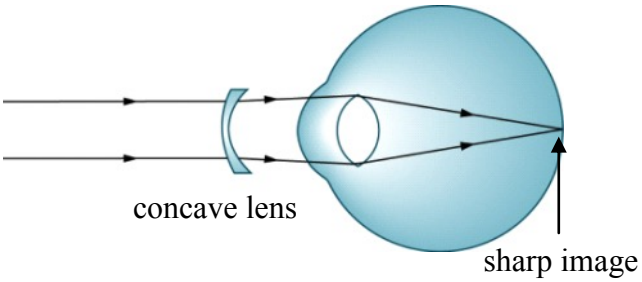
1.



2.



3.



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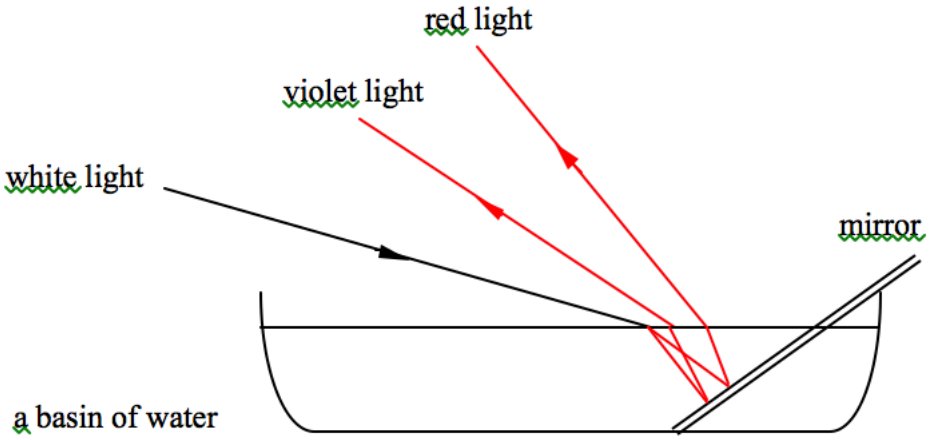


5. The colour of light at X is magenta.

E Long questions

1.

a Visible light.

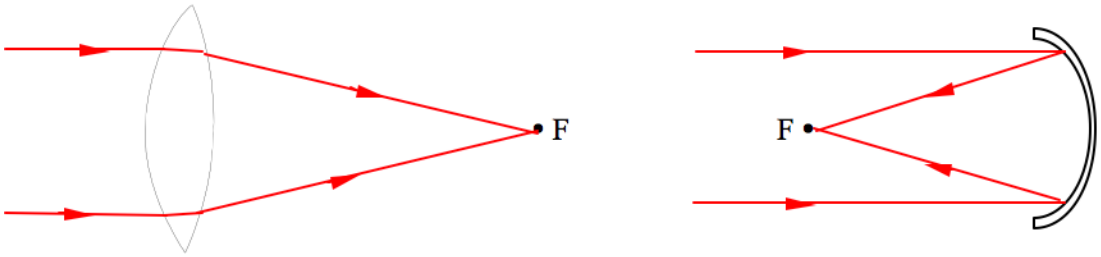
b Radio telescope.

It is because radio waves can penetrate clouds while visible light cannot.

c Reflection: radio telescope

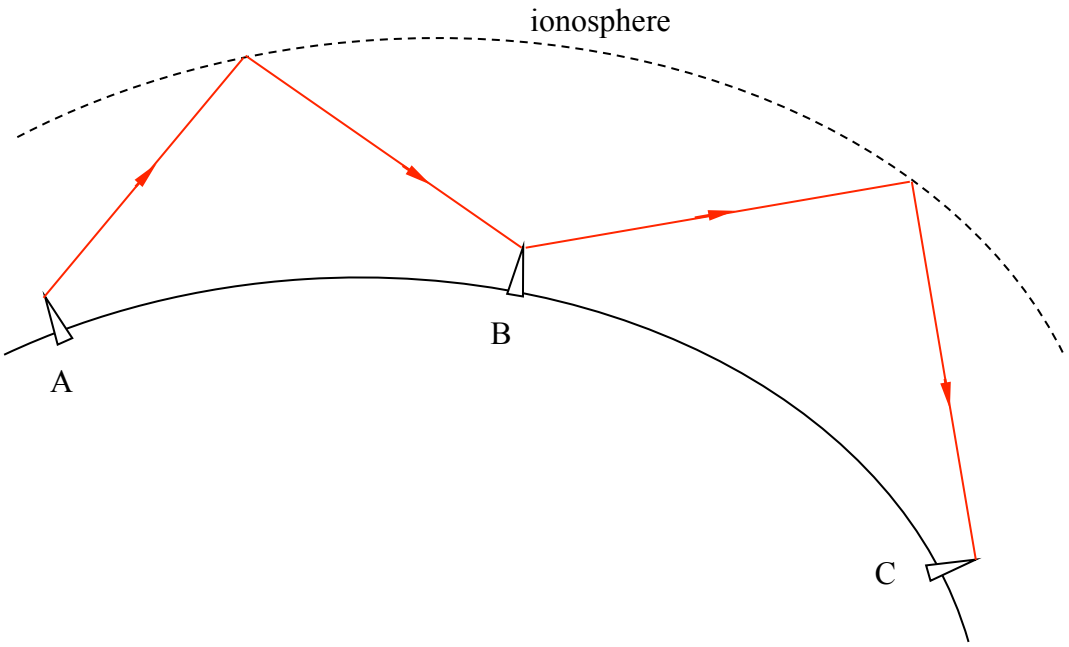
Refraction: light telescope

d

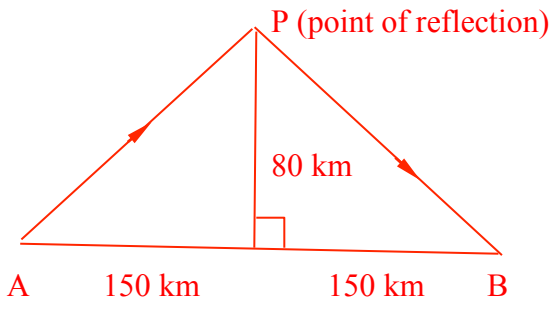


2.

a



b



$AP^2 = 150^2 + 80^2$

AP = 170 km

c The radio waves reflected twice to reach C.

So, the distance that the radio waves travelled = 170 km × 4 = 680 km

The time taken from A to C = 680 km ÷ 3×10^5 km/s = 0.00227 s.

d The time taken from A to C through the optic fibre

= 600 km ÷ 3×10^5 km/s = 0.002 s.

3.

a Microwaves.

b Distance between A and the satellite = 3×10^5 km/s × 0.017s = 5100 km

= 5000 km

c $(\text{Half the distance between AB})^2 = 5000^2 - 4000^2$

Half the distance between AB = 3000 km

Distance between AB = 3000 km × 2 = 6000 km