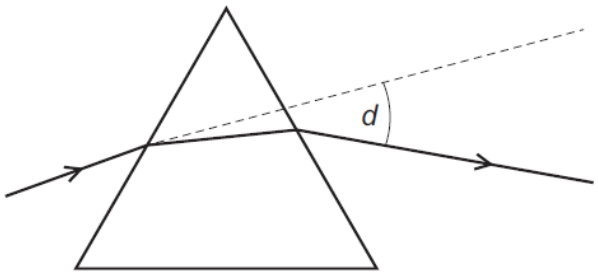
Electromagnetic spectrum – 2021 O Level 5054

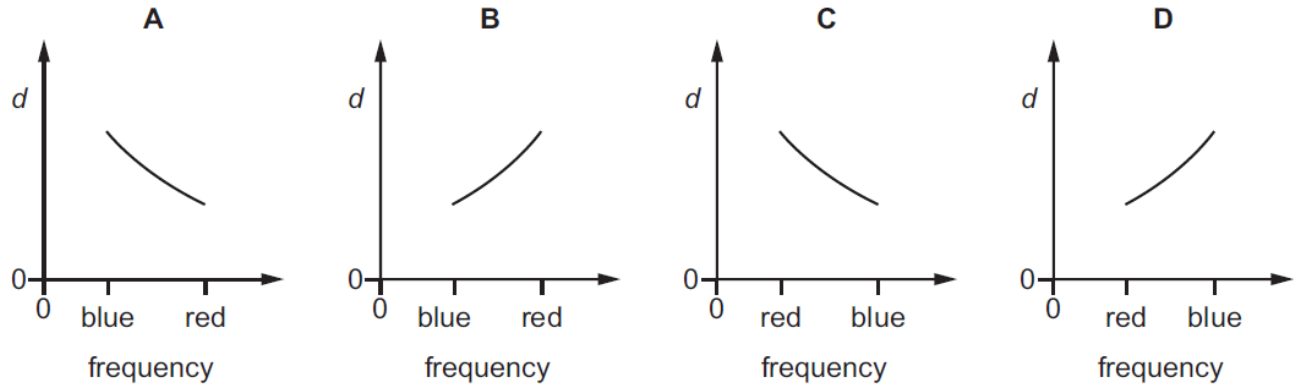
1. Nov/2021/Paper_11/No.23

Light rays are deviated by a prism.



The deviation angle *d* is measured for light rays of different frequency, including blue light and red light.

Which graph of *d* against frequency is correct?



2. Nov/2021/Paper_11/No.24

Which component of the electromagnetic spectrum is used for the remote control of a television?

A gamma rays

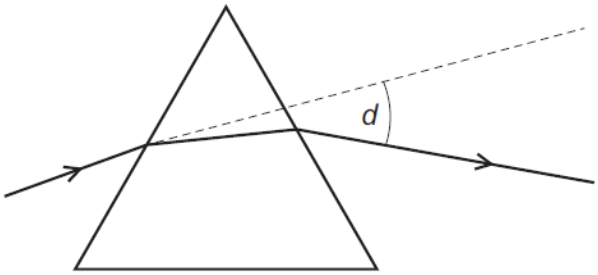
B infrared rays

C radio waves

D ultraviolet rays

3. Nov/2021/Paper_12/No.26

Light rays are deviated by a prism.



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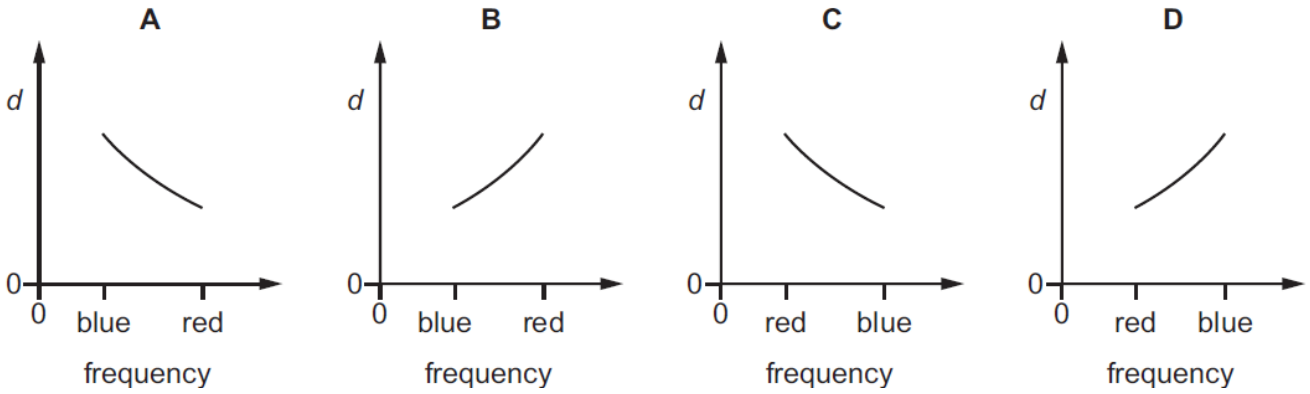


4. Nov/2021/Paper_12/No.27

A satellite orbits the Earth at a height of 300 km above the surface. The speed of electromagnetic waves is 3.0×10^8 m/s.

What is the minimum time taken for a radio signal transmitted from the Earth to reach the satellite?

A 1.0×10^{-6} s **B** 2.0×10^{-6} s **C** 1.0×10^{-3} s **D** 2.0×10^{-3} s

5. Nov/2021/Paper_21/No.3

A type of nuclear reaction takes place at the centre of the Sun. The reaction releases thermal energy.

(a) State the name of the type of nuclear reaction that takes place at the centre of the Sun.

..... [1]

(b) Thermal energy is emitted from the surface of the Sun into space. The energy is transferred through the vacuum of space by thermal radiation.

(i) Describe the radiation that is emitted from the surface of the Sun.

.....

.....

..... [2]

(ii) State the speed of this radiation in a vacuum.

speed = ... [1]

(iii) The Earth is 1.5×10^{11} m from the surface of the Sun.

Calculate the time taken for this radiation to travel to Earth.

time = ... [2]

(c) Explain one advantage of wearing white clothes on sunny days.

.....

.....

..... [2]

[Total: 8]

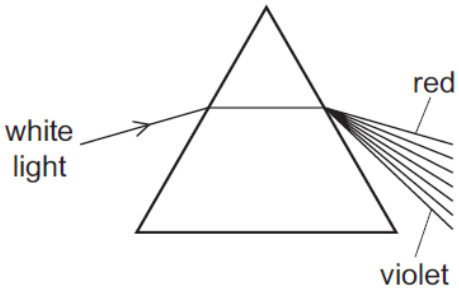
6. June/2021/Paper_11/No.24

White light enters a prism and forms a spectrum.

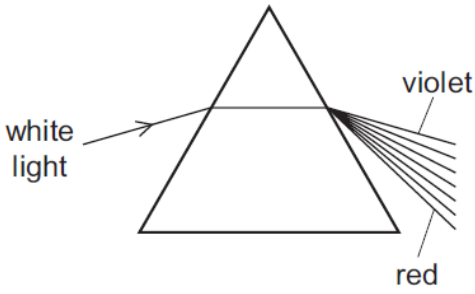
The rays in the air are labelled.

Which diagram shows how the white light is dispersed by the prism?

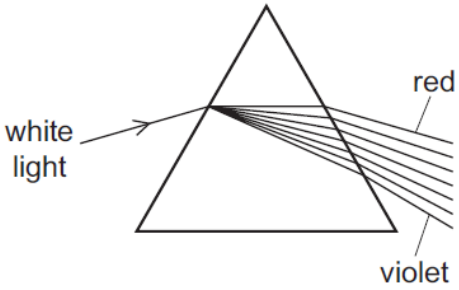
A



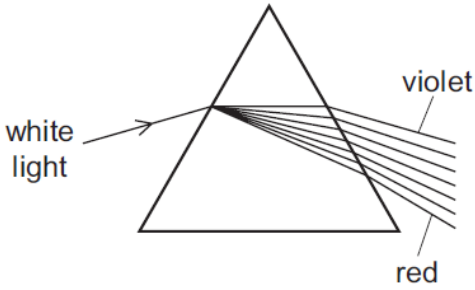
B



C



D



7. June/2021/Paper_12/No.27

Which two waves are components of the electromagnetic spectrum?

A light and sound

B water waves and infrared

C ultrasound and ultraviolet

D X-rays and microwaves

8. June/2021/Paper_22/No.10b

(b) White light is made up of different colours.

(i) State the name of four of the colours in the visible spectrum and place them in order from the smallest wavelength to the largest wavelength.

smallest wavelength .....

.....

.....

largest wavelength .....

[2]

(ii) A narrow beam of white light can be split into different colours.

Fig. 10.4 shows rays of white light emitted from a lamp.

Complete Fig. 10.4 to show how a narrow beam is produced from these rays and how a spectrum is shown on the screen. Label your diagram.

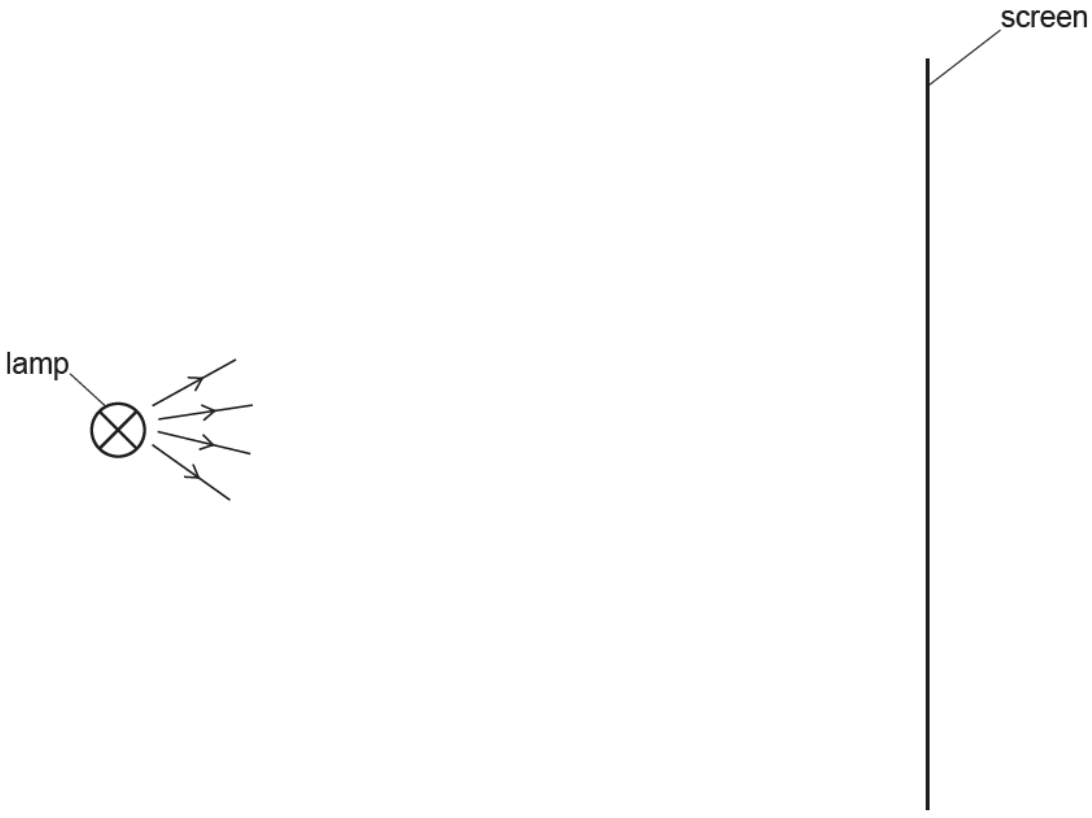


Fig. 10.4

[4]