

Electromagnetic spectrum– 2022 June O Level 5054

1. **June/2022/Paper_11/No.23**

Which waves are **not** part of the electromagnetic spectrum?

- A radio waves
- B television signals
- C ultrasound
- D ultraviolet

2. June/2022/Paper_22/No.8(d)

(d) Fig. 8.4 shows a connection to the internet made from a remote station A using a satellite above the Earth's surface.

Data is sent between stations A and B using microwaves which travel to and from the satellite.

Station B is connected directly to the internet using optical fibre.

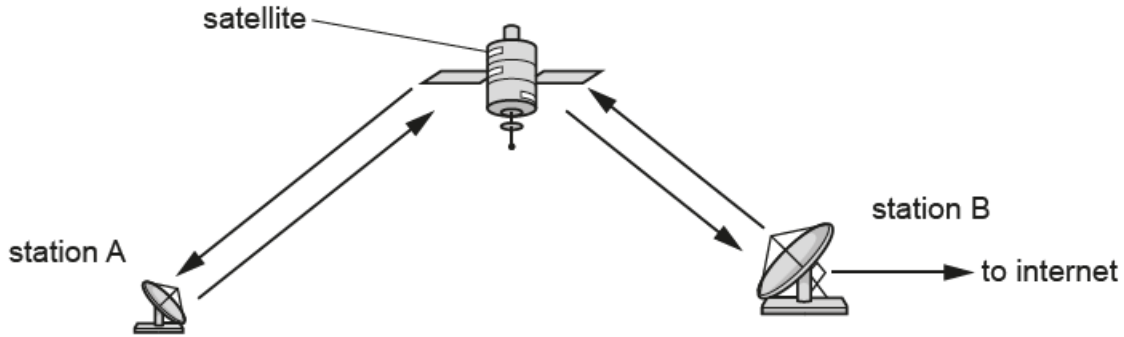


Fig. 8.4 (not to scale)

The speed of microwaves is 3.0×10^8 m/s.

Stations A and B are each 560 km from the satellite.

(i) Calculate the time taken for data to travel from A to B using microwaves.

time = [3]

(ii) The same data can be sent from A to B in a shorter time along the surface of the Earth using infrared waves to carry the information in optical fibres.

State **one** property that infrared waves and microwaves have in common.

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..... [1]

(iii) Suggest **one** other advantage of using optical fibres to connect stations A and B directly.

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..... [1]