What do waves transmit?
→ Energy

2. What type of wave is shown below?
→ (Depends on the image) — If the motion is up and down, it's a Transverse Wave.
If it's push and pull (compressions/rarefactions), it's a Longitudinal Wave.

3. (Based on a diagram – assuming typical values)
(a) Calculate the wavelength of the waves shown:
→ Measure crest to crest or trough to trough (use diagram units if given).
(b) What is the amplitude of these waves?
→ Measure from rest position to crest or trough (half the wave height).

4. 24 water waves pass a point in 6 seconds. What is the frequency?
→ Frequency = Waves / Time = 24 ÷ 6 = 4 Hz

5. A wave of wavelength 2 m travels 60 m in 12 s:

(a) What is the speed?
→ Speed = Distance / Time = 60 ÷ 12 = 5 m/s

(b) How many waves in 12 s?
→ Number = Distance / Wavelength = 60 ÷ 2 = 30 waves

(c) Frequency?
→ Frequency = Number of waves / Time = 30 ÷ 12 = 2.5 Hz

6. Wave machine at a pool:

(a) Speed = Distance / Time = 24 ÷ 20 = 1.2 m/s

(b) Frequency = Waves / Time = 5 ÷ 20 = 0.25 Hz

(c) Wavelength = Length / Number of waves = 24 ÷ 5 = 4.8 m

7. Surfer near beach:

(i) Wavelength = 8 m (from diagram)

(ii) Speed = Wavelength / Time = 8 ÷ 5 = 1.6 m/s

(iii) Frequency = 1 ÷ Period = 1 ÷ 5 = 0.2 Hz

ELECTROMAGNETIC SPECTRUM

1. Order of increasing frequency:
→ Radio < Infrared < Visible Light < Ultraviolet < X-Rays < Gamma Rays

2. Speed of EM waves in a vacuum:
→ 3×10^8 m/s

3. What happens to wavelength as frequency increases?
→ Wavelength decreases

4. What happens to energy as frequency increases?
→ Energy increases

5. Medical uses:

(a) X-Rays: Imaging bones and internal body parts
(b) Gamma Rays: Cancer treatment (radiotherapy)
(c) Infrared Radiation: Thermal imaging and detecting heat
(d) Ultraviolet Radiation: Sterilizing equipment, treating skin condition