1. A travelling wave carries:

   ☐ matter from place to place

   ☐ only heat

   ☐ nothing at all

   ☐ energy without moving matter along

2. A wave has frequency 50 Hz and wavelength 2 m. What is its speed, in $\frac{\text{m}}{\text{s}}$?

   _____ m/s

3. Which type of wave can be polarised?

   ☐ neither

   ☐ transverse only

   ☐ both equally

   ☐ longitudinal only

4. In a vacuum, radio waves and X-rays travel at:

   ☐ it depends on brightness

   ☐ radio is faster

   ☐ X-rays are faster

   ☐ the same speed, c

5. A siren moves toward you. Compared with its true note, you hear a:

   ☐ the same pitch

   ☐ higher pitch

   ☐ no sound

   ☐ lower pitch

6. Two waves of amplitude 3 cm meet exactly in phase. What is the amplitude where they overlap, in cm?

   _____ cm

7. Diffraction is the:

   ☐ speeding up of waves

   ☐ bouncing of waves off a mirror

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   ☐ cancelling of two waves

8. A device with thousands of fine slits that splits light into sharp spots is a diffraction _____.

   _____

9. Soap-bubble colours are caused by pigments in the soap.

   ☐ True ☐ False

10. Sound is a longitudinal wave.

    ☐ True ☐ False

1. **energy without moving matter along**

   A wave transfers energy; the medium only vibrates in place.

2. **100 m/s**

   $v = f\lambda = 50 \times 2 = 100\ \frac{\text{m}}{\text{s}}$.

3. **transverse only**

   Only transverse waves vibrate in a plane, so only they can be polarised.

4. **the same speed, c**

   All EM waves travel at the speed of light c in a vacuum.

5. **higher pitch**

   Approaching bunches the waves, giving a higher observed frequency (higher pitch).

6. **6 cm**

   Constructive: $3 + 3 = 6$ cm.

7. **spreading of waves through gaps and around edges**

   Diffraction is the spreading of waves as they pass gaps or edges.

8. **grating**

   A diffraction grating gives very sharp, bright maxima.

9. **False**

   Soap is colourless; the colours come from thin-film interference.

10. **True**

    Sound vibrates the air along the direction of travel – longitudinal.

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