Year 9 Physics: Waves and Sound Worksheet - Mark Scheme

Lower Secondary · Year 9 · Wave properties, sound and hearing

Section A: Wave basics [10 marks]

1(a)	wavelength	**1**
1(b)	frequency; hertz (Hz)	**2**
1(c)	amplitude	**1**
1(d)	transverse; longitudinal	**2**
2	Waves transfer energy (1) but not matter (1).	**2**
3	v = f × ? = 50 × 6 (1) = 300 m/s (1).	**2**

Section B: Sound [14 marks]

4	The drum skin vibrates (1). It makes air particles vibrate (1) creating compressions and rarefactions (1). The vibrations travel through the air to the ear (1).	**4**
5	Sound needs particles to vibrate (1) and a vacuum has no particles (1).	**2**
6	Sound travels fastest in solids because the particles are closest together so vibrations pass on faster. Guidance: 1 mark for each correct explanation. Accept: solids > liquids > gases.	**3**
7	d = v × t (1); 330 × 6 (1) = 1980 m (1).	**3**
8	Light travels much faster than sound (1) (about 300 000 000 m/s compared with 330 m/s) (1).	**2**

Section C: Pitch, loudness and hearing [14 marks]

9	Higher pitch; louder; lower pitch; quieter. Guidance: 1 mark each.	**4**
10	Quiet high note: small amplitude (1) and many waves close together (1). Loud low note: large amplitude and fewer waves (1).	**3**
11	Ultrasound (1). Use: scanning babies / cleaning / sonar / detecting cracks (1).	**2**
12	Sound waves hit a hard surface (1) and are reflected back to the listener (1).	**2**
13	Distance there and back = 1500 × 0.8 = 1200 m (2). Depth = 1200 ÷ 2 = 600 m (1).	**3**

Section D: Protecting hearing [2 marks]

14	Any two: wear ear defenders / ear plugs; turn the volume down; limit time exposed; stay away from loud speakers.	**2**

Total: 40 marks. Accept any scientifically correct alternative wording.