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Question 24 (Answer: **A**)

- Sound needs a medium, so it cannot cross a vacuum.
- It is longitudinal, so it cannot be polarised.
- Diffraction happens for every wave, which is why you can hear round a corner.

Question 25 (Answer: **B**)

- Sound is longitudinal, so the particles move back and forth along the direction of travel – never up or down, which rules out C and D.
- The wave moves away from the source, so each particle next takes the displacement currently held by the particle behind it.
- At Y that makes the displacement more negative, so the particle is heading back towards the source.

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Question 24 (Answer: **D**)

- In a longitudinal wave the oscillations are along the direction of travel, so the energy does travel parallel to them – true.
- Sound is longitudinal and needs a medium; there is no longitudinal wave in free space – true.
- The speed depends on the medium, much faster in steel than in air, so the third statement is false.

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Question 25 (Answer: **C**)

- A particle at zero displacement is passing through its equilibrium position, where it moves fastest.
- That is true of any oscillating particle, transverse or longitudinal.
- A fails for electromagnetic waves, B is simply false, and in a wave there is no *net* movement of particles.

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Question 25 (Answer: **B**)

- A compression is where the particles crowd together: those behind it are displaced forwards and those ahead are displaced backwards.
- On a graph of displacement-to-the-right that is a zero crossing running from positive down to negative.
- The peaks and troughs of the curve are where particles are furthest from equilibrium, not where the air is densest.

Question 28 (Answer: **D**)

- Polarisation confines the oscillation to one plane, which only means something if the oscillation is across the direction of travel.
- Longitudinal oscillations are along the direction of travel, so there is no plane to restrict.
- Diffraction and interference occur for both, and it is light – transverse – that crosses free space.

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Question 21 (Answer: **A**)

- In a longitudinal wave the particles oscillate along the direction of travel, so their displacement is to the left or right.
- A snapshot "at one instant in time" is plotted against distance, not against time.
- So the axes are distance and displacement of particles to the right.