Stationary waves – 2023 Nov AS Physics 9702

1. Nov/2023/Paper_ 9702/11/No.25

In an experiment, a stationary wave is formed on a string stretched horizontally between two fixed points.

Which statement about the experiment is correct?

A At certain times, the string between two nodes is horizontal with all points having zero displacement.

B Each point on the string between two antinodes has an oscillation of the same amplitude.

C The number of nodes is equal to the number of antinodes.

D Two adjacent antinodes oscillate in phase.

2. Nov/2023/Paper_ 9702/11/No.26

A musical organ produces notes by blowing air into a set of pipes that are open at one end and closed at the other.

The speed of sound in the air in the pipes is $320\,m\,s^{-1}$.

What is the lowest frequency of sound produced by a pipe of length 10 m?

A 4 Hz **B** 8 Hz **C** 16 Hz **D** 32 Hz

3. Nov/2023/Paper_ 9702/12/No.25

What can explain how stationary waves are formed from progressive waves?

A diffraction

B polarisation

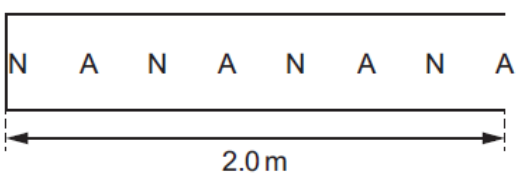
C superposition

D the Doppler effect

4. Nov/2023/Paper_ 9702/12/No.26

A pipe has a length of 2.0 m. It is open at one end and closed at the other end.

A stationary sound wave is set up within the pipe. There are four nodes (N) and four antinodes (A) within the length of the pipe.



What is the wavelength of the sound wave?

A 0.57 m **B** 1.1 m **C** 1.3 m **D** 1.6 m

5. Nov/2023/Paper_ 9702/13/No.25

Which statement concerning a stationary wave is correct?

A All the particles between two adjacent nodes oscillate in phase.

B The amplitude of the stationary wave is equal to the amplitude of one of the waves creating it.

C The wavelength of the stationary wave is equal to the separation of two adjacent nodes.

D There is no displacement of a particle at an antinode at any time.

6. Nov/2023/Paper_ 9702/13/No.26

Stationary sound waves can be formed in the air columns of pipes. One type of pipe is closed at one end and open at the other end. Another type of pipe is open at both ends.

Which pipe can form a stationary sound wave with the lowest frequency?