

- 27 Sound waves, emitted by a small loudspeaker, are reflected by a wall.

The frequency f of the waves is adjusted until a stationary wave is formed with the antinode nearest the wall at a distance x from the wall.

Which expression gives f in terms of x and the speed of sound c ?

- A $f = \frac{4c}{x}$ B $f = \frac{2c}{x}$ C $f = \frac{c}{2x}$ D $f = \frac{c}{4x}$

- 28 A diffraction grating has N lines per unit length and is placed at 90° to monochromatic light of wavelength λ .

What is the expression for θ , the angle to the normal to the grating at which the third order diffraction peak is observed?

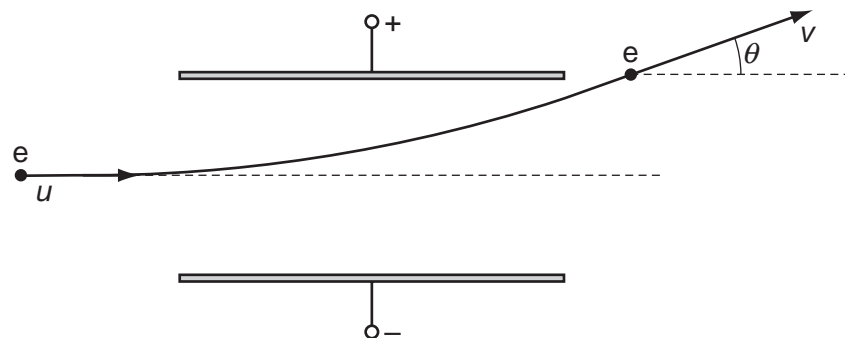
- A $\sin \theta = \frac{1}{3N\lambda}$ B $\sin \theta = 3N\lambda$ C $\sin \theta = \frac{N\lambda}{3}$ D $\sin \theta = \frac{3\lambda}{N}$

- 29 Light of wavelength 700 nm is incident on a pair of slits, forming fringes 3.0 mm apart on a screen.

What is the fringe spacing when light of wavelength 350 nm is used and the slit separation is doubled?

- A 0.75 mm B 1.5 mm C 3.0 mm D 6.0 mm

- 30 An electron enters the space between two parallel charged plates with an initial velocity u .



While in the electric field, its direction changes by θ and it emerges with a velocity v .

What is the relation between v and u ?

- A $v = \frac{u}{\cos \theta}$ B $v = u \cos \theta$ C $v = \frac{u}{\sin \theta}$ D $v = u \sin \theta$