Question Number	Answer	Mark
18(a)	• Use of $p = mv$ (1) • Use of conservation of momentum (1) • $v = 6.3$ m s^{-1} (1) Example of calculation Before: $p_{mallet} = 0.17$ kg × 1.6 m s^{-1} = 0.272 kg m s^{-1} After: $p_{mallet} = 0.17$ kg × 0.3 m s^{-1} = 0.051 kg m s^{-1} 0.272 kg m s^{-1} = 0.051 kg m s^{-1} + (0.035 kg × v) $v = 6.3$ m s^{-1}	**3**
18(b)	METHOD 1 (1) • Use of $E_k = ½mv^2$ • Use of sin 30° to determine vertical height moved by disc (1) • Use of $E_{grav} = mgh$ (1) • Use of $W = Fd$ (1) • Use of conservation of energy e.g. $E_k = E_{grav} + W$ (1) • $F_F = 6.6$ N (1) Example of calculation $E_k = ½ \times 0.035$ kg × (5.0 m s^{-1})^2 = 0.44 J $E_{grav} = 0.035$ kg × 9.81 N kg^{-1} × 0.065 m × sin 30° = 1.12 × 10^{-2} J 0.44 J = 1.12 × 10^{-2} J + (F_F × 0.065 m) 0.44 J - 0.0112 J = 0.43 J $F_F = 6.56$ N METHOD 2 • Use of $v^2 = u^2 + 2as$ to determine deceleration along ramp • $v = 0$ and a negative • Use of sin 30° to determine component of weight of disc down slope • Use of $\Sigma F = m\,a$ to determine resultant force along ramp • Subtraction of weight component from resultant force. • $F_F = 6.6$ N	**6**
	Total for question 18	**9**