Question number	Answer		Mark
17(a)	• Use of $\Delta p = m\Delta v$ • Use of $F\Delta t = \Delta p$ • $F = 0.14$ N Example of calculation $p = 0.11$ kg × 0.35 m s^{-1} = 0.039 kg m s^{-1} 0.039 N s = F × 0.28 s $F = 0.14$ N	1 1 1	(3)
17 (b)(i)	• Use of $p = mv$ • Use of correct components of p • Use of conservation of momentum • Speed = 0.26 m s^{-1} Example of calculation Momentum for puck 1 after collision = 0.11 kg × 0.28 m s^{-1} = 0.031 kg m s^{-1} component of momentum of puck 1 in the direction perpendicular to the initial velocity of puck 1 = 0.031 kg m s^{-1} × sin 49° = 0.023 kg m s^{-1} component of momentum of puck 1 in the direction perpendicular to the initial velocity of puck 1 = component of momentum of puck 2 in the direction perpendicular to the initial velocity of puck 1 0.023 kg m s^{-1} = p × sin 43° p = 0.034 kg m s^{-1} v = 0.034 kg m s^{-1} / 0.13 kg v = 0.26 m s^{-1}	1 1 1 1	(4)
17(b)(ii)	• Use of $E_k = ½ m v^2$ • A correct value of E_k [ecf for v_2] • Comparison of kinetic energy before and after collision and conclusion that kinetic energy before collision is different to kinetic energy after collision, so it is not an elastic collision [accept inelastic] **Or** Comparison of kinetic energy before and after collision and conclusion that so kinetic energy is not conserved, so it is not an elastic collision [accept inelastic] Example of calculation Before collision $E_k = ½ m v^2 = ½$ × 0.11 kg × (0.41 m s^{-1})^2 = 0.0092 J After collision $E_k = ½ m v^2 = ½$ × 0.11 kg × (0.28 m s^{-1})^2 = 0.0043 J $E_k = ½ m v^2 = ½$ × 0.13 kg × (0.26 m s^{-1})^2 = 0.0044 J Total after = 0.0087 J 0.0092 J > 0.0087 J	1 1 1	(3)
17(c)	• The assumption is that no (resultant) external forces act • Because if external forces act there will be acceleration, so the final momentum will be different than otherwise **Or** if external forces act there will be an (additional) impulse, so the change in momentum will be different	1 1	(2)