

| Question Number | Scheme | Marks |
|-----------------|---|------------|
| 7(a) | Inextensible string | B1 (1) |
| | MARK PARTS (b) and (c) together | |
| (b) | $4mg \sin \alpha - T - F = 4ma$ | M1 A2 |
| | $T - mg = ma$ | M1 A1 (5) |
| | | |
| (c) | $F = \frac{1}{4} R$ | B1 |
| | $R = 4mg \cos \alpha$ | B1 |
| | $\cos \alpha = \frac{4}{5}$ or $\sin \alpha = \frac{3}{5}$ | B1 |
| | Eliminating R, F and T | M1 |
| | $a = \frac{3}{25} g = 1.2$ or $1.18 (\text{m s}^{-2})$ | A1 (5) |
| | | |
| (d) | $v^2 = 2 \times \frac{3}{25} gh = \frac{6}{25} gh$ | M1 |
| | $0^2 = \frac{6}{25} gh - 2gs$ | |
| | $s = \frac{3}{25} h$ | M1 A1 |
| | $d > \frac{3}{25} h + h = \frac{28}{25} h$ GIVEN ANSWER | DM1 A1 (5) |
| | | (16) |
| | Notes for Qu 7 | |
| 7(a) | B1 for inextensible (and taut) string; B0 if any extras given or if an incorrect consequence of the inextensibility of the string is given. | |
| 7(b) | MARK PARTS (b) and (c) together N.B. Omission of m is a Method error i.e. M0 for that equation First M1 for equation of motion for P with usual rules (omission of 4 on RHS is M0) First A1 and second A1 for a correct equation, A1A0 if one error Second M1 for equation of motion for Q with usual rules Third A1 for a correct equation Use of e.g $\cos(4/5)$ instead of $\cos \alpha$ is an A error unless they recover correctly. N.B. Allow consistent use of $-a$ | |
| 7(c) | First B1 for $F = \frac{1}{4} R$ seen or implied Second B1 for $R = 4mg \cos \alpha$ seen or implied Third B1 for $\cos \alpha = \frac{4}{5}$ or $\sin \alpha = \frac{3}{5}$ seen or implied or an appropriate correct angle is used to give a correct trig ratio First M1 for eliminating R, F and T and finding an a value First A1 $a = \frac{3}{25} g = 1.2$ or $1.18 (\text{m s}^{-2})$ (must be positive) | |