

Year 2 Applied Chapter 7: Light Inextensible Strings
Exam Questions (Answers)

Q1.

Question Number	Scheme	Marks
	$(\uparrow), T \cos 30 + F \cos 60 = 2g$ $(\rightarrow), T \cos 60 - F \cos 30 = 0$ $F = g = 9.8$ $T = \sqrt{3}g = 17 \text{ or } 17.0$	M1 A1 M1 A1 M1 A1 M1 A1 8
	OR: $(\square), F = 2g \cos 60$ $(\square), T = 2g \cos 30$ $F = g = 9.8$ $T = \sqrt{3}g = 17 \text{ or } 17.0$	M1 A1 M1 A1 M1 A1 M1 A1 8

Q2.

Question Number	Scheme	Marks
a	Resolving horizontally: $T \cos 30^\circ = 6 \cos 50^\circ$ $T = 4.45 \text{ (N)}, 4.5 \text{ (N)}, \text{ or better}$	M1A1 A1 (3)
b	Resolving vertically: $W = 6 \cos 40^\circ + T \cos 60^\circ$ $= 6.82 \text{ (N)}, 6.8 \text{ (N)}, \text{ or better}$	M1A1 A1 (3)
		[6]

Q3.

$$W = T \cos 25$$

$$5 + T \sin 25$$

$$T = 11.8$$

$$W = 10.7$$

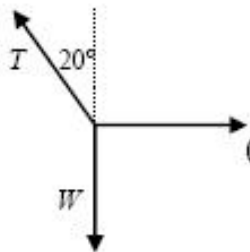
Q4.

Question Number	Scheme	Marks
	$T_P \cos 55 = T_Q \cos 35$ $T_P \sin 55 + T_Q \sin 35 = 2g$ Eliminating T_P or T_Q $T_P = 16\text{N or } 16.1\text{N}; T_Q = 11\text{N or } 11.2\text{N}$	M1 A1 M1 A1 M1 A1 A1 7
ALT 1	(Along RP) $T_P = 2g \cos 35^\circ = 16\text{N or } 16.1\text{N}$ (Along RQ) $T_Q = 2g \cos 55^\circ = 11\text{N or } 11.2\text{N}$	M1 M1 A1 A1 M1 A1 A1

Q5.

Question Number	Scheme	Marks
alt	Resolve horizontally: $T_A \cos 35^\circ = T_B \cos 25^\circ$ Resolve vertically: $T_A \sin 35^\circ + T_B \sin 25^\circ = 8$ Equation in one unknown: $T_B \frac{\cos 25^\circ}{\cos 35^\circ} \sin 35^\circ + T_B \sin 25^\circ = 8$ or $T_A \sin 35^\circ + T_A \frac{\cos 35^\circ}{\cos 25^\circ} \sin 25^\circ = 8$ $T_A = 8.4, 8.37, 8.372$ (N) or better $T_B = 7.6, 7.57, 7.567$ (N) or better OR Using Sine Rule on triangle of forces: $\frac{8}{\sin 60^\circ} = \frac{T_A}{\sin 65^\circ} = \frac{T_B}{\sin 55^\circ}$ $\frac{8 \times \sin 65^\circ}{\sin 60^\circ} = T_A, = 8.4, 8.37, 8.372$ (N) or better $\frac{8 \times \sin 55^\circ}{\sin 60^\circ} = T_B, = 7.6, 7.57, 7.567$ (N) or better	M1A1 M1A1 DM1A1 A1 A1 (8) M1A1 M1A1, A1 M1A1, A1

Q6.

Question Number	Scheme	Marks
12	 (a) $\rightarrow T \sin 20^\circ = 12$ $T \approx 35.1 \text{ (N)}$ awrt 35 (b) $\uparrow W = T \cos 20^\circ$ $\approx 33.0 \text{ (N)}$ awrt 33	M1 A1 A1 (3) M1 A1 DM1 A1 (4) [7]