Mechanics models

June02q3c
Explain briefly where the assumption that the strings are light has been used in your answer to part (a). *[Moments with light inextensible strings involved]*
Tension equal along string, i.e. tensions = weights throughout or no contributions from strings in moments equation

June02q7c
state two physical factors, apart from air resistance, which could be taken into account to make the model more realistic. *[Smooth pulley and smooth slope]*
Any two from: weight of pulley; friction at pulley; friction on slope; weight of string; string extensible; 'spin' of particle

Jan03q7d
State one physical factor which could be taken into account to make the model used in this question more realistic. *[Ball projected upwards, hits soft ground that exerts constant force F to bring it to rest after sinking 2.5 cm]*
Air resistance; variable F;

June03q3c
State two physical factors which have been ignored in the model. *[Diver dives from springboard]*
Air resistance; 'spin'; height of diver; hit board again; horizontal component of velocity

Jan04q5c
The string in this question is described as being 'light'.
(i) Write down what you understand by this description.
(ii) State how you have used the fact that the string is light in your answer to part (a). *[Pulley question]*
(i) String has no weight/mass
(ii) Tension in string constant, i.e. same at A and B

June04q7c
State how you have used the information that the string is inextensible. *[Two balls connected by a string]*
Accelerations of *P* and *Q* are same

Jan05q5d
State how in your calculations you have used the information that the string is inextensible. *[Pulley question]*
Same acceleration for A and B.

June05q8e
State one physical factor, other than air resistance, which would be needed in a refinement of the model of the ball's motion to make the model more realistic. *[Ball being kicked]*
Allow 'wind', 'spin', 'time for player to accelerate', size of ball
Do not allow on their own 'swerve', 'weight of ball'.

Jan06q3b
State what is implied by the modelling assumption that the beam is uniform. *[Moments question]*
Weight/mass acts at mid-point; or weight/mass evenly distributed (o.e.)

June06q6d
State how you have used the modelling assumption that the tow-rope is inextensible. *[Car towing trailer]*
Same acceleration for car and trailer

Jan07q2d
State how you have used the model of the rock as a particle. *[Moments, rock on a rod at point B]*
The weight of the rock acts precisely at *B*.

Jan07q7d
State where in your calculations you have used the information that the string is inextensible. *[Pulley question]*
The (magnitudes of the) accelerations of *P* and *Q* are equal

June07q6d
State how you have used the information that the string is inextensible. *[Pulley question]*
The acceleration of *P* is equal to the acceleration of *Q*.

Jan08q7d
State how you have used the information that the string is light. *[Pulley question]*
Same tension on *A* and *B*

June08q8d
State how in your calculation you have used the information that the string is inextensible. *[Two balls connected by a string]*
The acceleration of *P* and *Q* (or the whole of the system) is the same.

Specimenq3c
State briefly how you have used the modelling assumption that
(i) the plank is a rod,
(ii) the woman is a particle. *[Moments question with a woman on the rod (marvelous innuendo) at point C]*
(i) Plank remains a straight line/rigid.
(ii) Weight of woman acts at *C*.

Specimenq5c
State a modelling assumption which you have made about the trucks in your solution
[Truck collision]
Trucks are assumed to be particles

Mockq4c
State how you have used the modelling assumptions that
(i) the plank is uniform,
(ii) the plank is a rod, *[Moments question]*
(iii) Jack and Jill are particles.
(i) weight acts at center
(ii) plank remains straight
(iii) weights act at ends of plank