

Name of the Student: _____

Max. Marks : 17 Marks

Time : 17 Minutes

Mark Schemes

Q1.

(a) A

must be correct for reason to score

moment (due to weight) of sail is the largest

1

or

(perpendicular) distance from pivot to rope the smallest

*do **not** accept sail is low **or** sail is too heavy*

1

(b) (i) no resultant turning moment **or** in a state of balance **or** balanced*allow clockwise moments =**anticlockwise moments**allow no resultant force**allow (forces are) balanced**allow no acceleration**do **not** allow forces are equal*

1

(ii) moment = 420

*allow **1** mark for moment = 700×0.6* **or** *$700 \times$ a distance from diagram (1.5, 2.1, 0.9)*

2

(iii) force = 280

 $420 = F \times 1.5$ **or** $F = \frac{\text{their (b)(ii)}}{1.5}$ ***1** mark only**if (b)(ii) obtained by a correct method (1470, 630, 1050)*

2

(c) (as wind speed increases) the force on the sail increases

accept pressure

1

anticlockwise moment increases **or** moment on sail increases

1

so clockwise moment (**or** opposite moment) needs to increase (by increasing the distance from the pivot)

1

[10]

Q2.

(a) (i) zero

accept nothing

1

speed is zero

accept not moving

1

(ii) A

1

largest mass **or** weight

accept heaviest luggage

*do **not** accept largest luggage*

1

(iii) momentum does change

accept yes

1

direction is changing

accept velocity is changing

*do **not** accept answers in terms of speed changing*

1

(b) kg m/s

1

[7]