

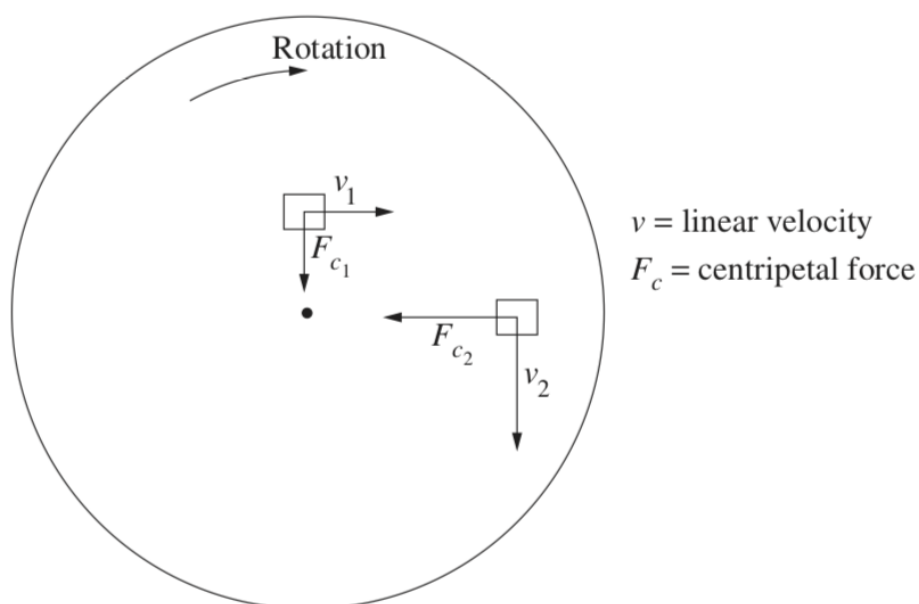
New Syllabus NESAs Questions:

- 1) C
- 2) D
- 3) B
- 4)

Marking guidelines:

Criteria	Marks
• Correctly draws vector arrows to show the directions and relative magnitudes of the linear velocities and centripetal forces	3
• Correctly draws vector arrows to show the direction of the linear velocities and/or centripetal forces	2
• Provides some relevant information	1

Sample answer:



5)

Marking guidelines (a):

Criteria	Marks
• Correctly uses the gradient of the graph to determine the mass of the car	3
• Provides some correct steps in calculating the mass of the car	2
• Provides a correct step in calculating the mass of the car	1

$$\text{From graph, gradient} = \frac{3.1 - 0}{25 - 2} = 0.135$$

$$F = \frac{mv^2}{r}$$

$$\text{gradient} = \frac{F}{v^2} = \frac{m}{r}$$

$$0.135 = \frac{m}{0.25}$$

$$m = 0.25 \times 0.135 = 0.034 \text{ kg}$$

Marking guidelines (b):

Criteria	Marks
<ul style="list-style-type: none"> Identifies possible errors in the data Outlines how to reduce their effects 	4
<ul style="list-style-type: none"> Identifies possible errors in the data Outlines how to reduce the effect of one source of error in the data 	3
<ul style="list-style-type: none"> Identifies possible errors in the data OR <ul style="list-style-type: none"> Outlines how to reduce the effect of one source of error in the data 	2
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:

The sensor will produce a systematic error if it has not been zeroed or calibrated correctly. The sensor error can be minimised by zeroing it and checking it against a known force such as the force of gravity on a 1-kg mass.

If a manual stopwatch were used to time the rotations, allowing the linear velocity to be calculated using $v = r\omega$, then random errors would arise due to judgement or reaction times. The timing/random error can be minimised by measuring the time for several rotations at a constant ω and then dividing the time by the number of rotations.

2017:

15) B

Question 22 (a)

Criteria	Marks
<ul style="list-style-type: none"> Provides TWO ways of increasing torque 	2
<ul style="list-style-type: none"> Provides ONE way of increasing torque 	1

Sample answer:

The torque can be increased by increasing the applied force or by increasing the distance between the nut and the point of the applied force.

2016:

18) C

2015:

14) C

2014:

3) D

2010:

5) D

2009:

2) A

**Before 2009 there were no answers given for short answer
please use a book like Excel Physics**

2007:

1) A

2006:

2) B

2003:

2) A