

Q1.

Question number	Answer	Mark			
(i)	<table border="1" style="margin-left: 20px;"> <tr> <td>B</td> <td>1</td> <td>same as P</td> </tr> </table> <p>The only correct answer is B</p> <p><i>A is incorrect because the number of teeth on P and R are equal</i></p> <p><i>C is incorrect because Q reverses the rotation of P and then R reverses the rotation of Q</i></p> <p><i>D is incorrect because Q reverses the rotation of P and then R reverses the rotation of Q</i></p>	B	1	same as P	(1) AO 1 1
B	1	same as P			

Question Number:	Answer	Additional Guidance	Mark
(ii)	<p>use of distance = pitch x number of teeth (moved) (1)</p> <p>evaluation (1)</p> <p>(distance =) 20 (mm)</p>	<p>allow first mark if 2 x 4 (=8) or 2 x 40 (=80) seen</p> <p>award full marks for correct answer without working</p>	(2) AO 1 1

Q2.

Question number	Answer	Additional guidance	Mark
	counting teeth on the pinion (1) evaluation (1) 1.6 (m)	allow between 18 and 22 inclusive 20 x 0.08 ecf number of teeth answer in range 1.44 to 1.76 scores 2 marks award full marks for the correct answer without working power of 10 error scores 1 mark maximum	(2) A03.1

Q3.

Question Number	Answer	Additional guidance	Mark
(i)	(In every second), distance moved by chain around large gear = distance moved by chain around small gear (1) $2 \times 48 = \text{turns} \times 12$ rearrangement and evaluation (1) 8 (turns each second)	accept use of gear ratio seen or implied e.g. 4:1 or 4/1 or 48:12 or 48/12 or converse e.g. 1:4 award full marks for the correct answer without working	(2)