Question Number	Scheme	Marks
2(a)	$S_{gg} = 3624.41 - \frac{144.84^2}{9} \left[= 1293.4516\right]$	M1
	$r = \frac{40.25}{\sqrt{"1293.4516" \times 1.29}}$	M1
	= 0.985…. awrt 0.985	A1
		(3)
(b)	As the population/t increases, GDP/g increases oe	B1
		(1)
(c)	$b = \frac{40.25}{1.29} \left[= 31.20155...\right]$	M1
	$a = \frac{144.84}{9} - "31.20155..." \times \frac{7.87}{9} \left[= -11.19068....\right]$	M1
	$g = ...31.20155...t$	A1
	$g = -11.2 + 31.2t$	A1
		(4)
(d)	The **GDP/*g*** increases by (an average of) **"31.2" billion [**dollars] when the **population/*t*** increases by **one million**.	B1
		(1)
(e)(i)	$"-11.2" + "31.2" \times 7$	M1
	= 207.2… awrt 207	A1
		(2)
(ii)	Unreliable as 7 000 000 is much greater than the mean population/ $\bar{t}$ for the 9 years.	B1
		(1)
(f)	$0.1 = "31.2" x$	M1
	$x = 0.003205...$ million people awrt 0.0032	A1
		(2)
	Notes	**Total 14**

(a)	**M1**	Correct method for finding S_{gg} (implied by awrt 1290 to 3sf)
	M1	Correct method for finding r using their S_{gg} If S_{gg} = 3624.41 is used here, then M0.
	A1	awrt 0.985 (correct answer only scores M1M1A1)
(b)	**B1**	A correct interpreted contextual statement including population (or t) and GDP (or g). 'Strong positive correlation between population and GDP' on its own is B0.
(c)	**M1**	Correct method for finding b
	M1	Correct method for finding a using their b $a = 16.0... - "31.20155..." \times 0.874... \left[= -11.19068....\right]$
	A1	Only dep on 1st M1 awrt 31.2 in a regression equation (allow any variables in the equation).
	A1	Correct equation $g = \text{awrt} -11.2 + \text{awrt } 31.2t$ (must be g and t) Do not allow fractions.
(d)	**B1**	Idea that the GDP increases by "Their b" billion dollars for every 1 million increase in population
(e)(i)	**M1**	Correct method. Allow substitution of 7 000 000 instead of 7
	A1	awrt 207 (billion) (isw after an answer of 207 is seen)
(ii)	**B1**	Unreliable with a correct supporting comment which must reference t or $\bar{t}$ [=0.874] or population 'Extrapolation so unreliable' on its own is B0. Reference to g out of range is also B0.
(f)	**M1**	Equating 0.1 with "their b" × x Or substituting two values for g with a difference of 0.1 in their equation leading to a value of x
	A1	awrt 0.0032 (million) Allow awrt 3200 (to 2sf) Do not allow fractions.