Question Number	Scheme	Marks
6. (a)	$\{S_{yy} =\} 42.63 - \dfrac{23.7^2}{16} \quad = [7.524375]$	B1
		(1)
(b)	Use of $\bar{y} = 3.684 - 0.3242\bar{x}$; so $\sum x = 16 \times \left(\dfrac{3.684 - \frac{23.7}{16}}{0.3242} \right) = 108.71067..$	M1; A1
	$\{S_{xx} =\} 756.81 - \dfrac{("108.71..")^2}{16}$; = 18.18435… awrt **18.2**	M1; A1
		(4)
(c)	$b = \dfrac{S_{xy}}{S_{xx}} \Rightarrow S_{xy} = "18.1843.." \times (-0.3242) [= -5.8953..]$; $r = \dfrac{"-5.89536..."}{\sqrt{"18.184.." \times 7.524375}}$	M1; M1
	$= -0.50399\ldots$ = **$-0.49 \sim -0.51$**	A1
		(3)
(d)	Sub $x = 2$ in the regression line gives $y = 3.0356$	B1
		(1)
(e)	St.dev = $\sqrt{\dfrac{S_{xx}}{n}} = \sqrt{\dfrac{"18.184..."}{16}} = 1.066...$	M1
	So limits are: $\dfrac{"108.71..."}{16} \pm 3 \times "1.066\ldots" =$ 3.5965…~ 9.9929… = awrt **3.6~10**	M1, A1
		(3)
(f)	The probability of $x = 2$ being in the range is very small; so Behrouz's estimate is unreliable	B1ft; dB1ft
		(2)
(g)	Should use regression of x on y to estimate unemployment or equivalent So Andi's suggestion is not suitable or not to be recommended	B1 dB1
		(2)
		[16 marks]

	Notes	
(a)	B1	Value given so must see sight of a correct expression – allow 561.69 for 23.7^2
(b)	1st M1	for clear use of regression line with $\bar{y}$ or $\sum y$
	1st A1	for $\sum x$ = awrt 109
	2nd M1	for a correct expression for S_{xx} ft their Σx
	2nd A1	for awrt 18.2
(c)	1st M1	for use of gradient to find S_{xy}
	2nd M1	for a correct expression for r ft their S_{xy} and S_{xx}
	A1	for an answer in the range –0.49 ~ –0.51
(d)	B1	for sight of $y = 3.03\ldots$ or better. Allow 3.04
(e)	1st M1	for a correct attempt at st. dev. ft their S_{xx} or $\sqrt{\dfrac{756.81}{16} - \left(\dfrac{"108.71..."}{16} \right)^2}$ ft their Σx
	2nd M1	for one correct calc…ft their values
	A1	for a range awrt 3.6~10
(f)	1st B1ft	for a correct reason ft their range in part (e) eg $x = 2$ is outside the range. Allow extrapolation
	2nd dB1ft	dep on 1st B1 for stating a correct conclusion for their range
(g)	1st B1	for a suitable reason based on reg line, eg regression line (y on x) can only be used to estimate wages. Allow x instead of unemployment and y instead of wages
	2nd dB1	dep on 1st B1 for suggesting not suitable (or equivalent)

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