Question Number	Scheme	Marks
3. (a)	$H_0 : \rho = 0$ $\quad$ $H_1 : \rho \neq 0$	B1
	$[r =] \dfrac{83.634}{\sqrt{2.486 \times 3026.234}} = 0.9642.....$ $\quad$ awrt 0.964	M1 A1
	CV = 0.7545	B1ft
	[Reject H_0/Significant] There is evidence of correlation between annual tea consumption and population.	A1
		(5)
(b)	**Country** A B C D E F G	
	***T* Rank** 5 6 4 7 1 2 3	
	***P* Rank** 7 6 4 3 1 2 5	
	or	M1
	Country A B C D E F G	
	***T* Rank** 3 2 4 1 7 6 5	
	***P* Rank** 1 2 4 5 7 6 3	
	$\sum d^2 = 4+0+0+16+0+4 [= 24]$	M1
	$[r_s =] 1 - \dfrac{6(24)}{7(48)} = 0.571428...$ $\quad$ awrt 0.571	dM1A1
		(4)
(c)	$H_0 : \rho_s = 0$ $\quad$ $H_1 : \rho_s > 0$	B1
	CV = 0.7143	M1
	[Do not reject H_0 / not significant] There is not enough evidence to suggest a positive correlation between annual tea consumption and population.	A1ft
		(3)
		[12]

	Notes
(a)	1st B1 both hypotheses correct in terms of ρ (must be two-tailed). Condone use of *p* M1 use of formula for *r* (May be implied by awrt 0.964) 1st A1 awrt 0.964 2nd B1ft 0.7545 (or better) or ft 1-tailed alternative hypothesis (0.6694) 2nd A1 correct contextual conclusion including tea consumption/*t* and population/*p*. Must be consistent with their *r* and their CV. (Ignore any non-contextual conclusion) Allow positive correlation
(b)	1st M1 attempt to rank each country for tea and population (at least 4 correct in each) 2nd M1 for $\sum d^2$ for their ranks (implied by $\sum d^2 = 24$) 2nd M1 (dep on 1st M1) use of $1 - \dfrac{6('24')}{7(48)}$ A1 awrt 0.571 (or $\dfrac{4}{7}$)
(c)	B1 both hypotheses correct in terms of ρ or ρ_s. Condone use of *p* M1 0.7143 (or better) A1ft correct contextual conclusion including positive, tea consumption/*t* and population/*p*. (Ignore any non-contextual conclusion) ft their part (b)