3. The table shows the annual tea consumption, t (kg/person), and population, p (millions), for a random sample of 7 European countries.

Country	A	B	C	D	E	F	G
Annual tea consumption, t (kg/person)	0.27	0.15	0.42	0.06	1.94	0.78	0.44
Population, p (millions)	5.4	5.8	9	10.2	67.9	17.1	8.7

(You may use $S_{tt} = 2.486$ $S_{pp} = 3026.234$ $S_{pt} = 83.634$)

Angela suggests using the product moment correlation coefficient to calculate the correlation between annual tea consumption and population.

(a) Use Angela's suggestion to test, at the 5% level of significance, whether or not there is evidence of any correlation between annual tea consumption and population.
State your hypotheses clearly and the critical value used.

(5)

Johan suggests using Spearman's rank correlation coefficient to calculate the correlation between the rank of annual tea consumption and the rank of population.

(b) Calculate Spearman's rank correlation coefficient between the rank of annual tea consumption and the rank of population.

(4)

(c) Use Johan's suggestion to test, at the 5% level of significance, whether or not there is evidence of a positive correlation between annual tea consumption and population.
State your hypotheses clearly and the critical value used.

(3)

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(Total for Question 3 is 12 marks)

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