Question 10 **(11 marks)**

A school canteen manager recorded the number of ice-creams sold for three weeks. The data are recorded in the table below, together with some calculations.

	Sales day (d)	**Ice-cream sales**	**Weekly mean**	**Percentage of weekly mean**
Monday	1	210		132.9%
Tuesday	2	230		145.6%
Wednesday	3	100	$\boldsymbol{B}$	63.3%
Thursday	4	90		57.0%
Friday	5	160		101.3%
Monday	6	190		128.4%
Tuesday	7	230		155.4%
Wednesday	8	90	148	60.8%
Thursday	9	80		54.1%
Friday	10	150		101.4%
Monday	11	180		126.8%
Tuesday	12	220		154.9%
Wednesday	13	$\boldsymbol{A}$	142	$\boldsymbol{C}$
Thursday	14	70		49.3%
Friday	15	150		105.6%

(a) Determine the values of $\boldsymbol{A}$, $\boldsymbol{B}$ and $\boldsymbol{C}$, giving the value of $\boldsymbol{C}$ correct to one decimal place.

(4 marks)

(b) (i) Use the average percentage method to complete the table below by calculating the seasonal index for Wednesday. (1 mark)

Day	Seasonal index
Monday	129.4% = 1.294
Tuesday	152.0% = 1.520
Wednesday	
Thursday	56.8% = 0.568
Friday	102.8% = 1.028

(ii) Use the seasonal index to determine the deseasonalised number of ice-cream sales for Tuesday of Week Three, correct to the nearest 10. (2 marks)

(c) The equation of the least-squares line used to forecast the deseasonalised number of ice-cream sales is

$$\text{deseasonalised number of ice-creams} = -1.695d + 161.16.$$

(i) Describe the trend in the number of ice-cream sales over time. (1 mark)

(ii) Predict the **actual** number of ice-cream sales for Friday of Week Four. (3 marks)