5. A large supermarket chain conducts a survey. An interviewer stands outside one of the supermarkets and interviews customers until a set number of customers in three different age categories have been interviewed.

(a) (i) Name the type of sampling method used.

(ii) In this case, state one possible disadvantage of using this sampling method rather than simple random sampling.

(2)

In the interview, the customer is asked about their age group and the type of product they usually buy. The results are shown below.

		Type of product			
		Value	**Standard**	**Luxury**	**Total**
Age (years)	**Under 30**	29	23	8	60
	30–50	16	29	30	75
	51 and over	20	26	19	65
	Total	65	78	57	200

A chi-squared test is carried out using these results to investigate whether or not there is an association between the type of product bought and the age of the customer.

(b) Calculate the expected frequencies for the age group **Under 30** who bought

(i) value products,

(ii) luxury products.

(2)

The value of $\sum \frac{(O-E)^2}{E}$ for the **other seven classes** is 6.456 to 3 decimal places.

(c) Carry out a suitable test, at the 1% level of significance, to determine whether or not there is an association between the type of product bought and the age of the customer.
Show your working clearly, stating your hypotheses, the degrees of freedom, the test statistic and the critical value used.

(7)

(Total for Question 5 is 11 marks)