## Section E Research methods

Answer all questions in the spaces provided.

- A psychologist conducted an experiment to find out if people reacted more quickly to a ringing bell or to a flashing red light. Each participant sat in front of a machine which could make a sound like a ringing bell, or could flash a red light. The participant had to press a button on the machine immediately when they:
  - heard a bell ring

or

saw a red light flash.

The machine recorded their reaction times in milliseconds.

5 (a) (i)	Identify the independent variable in this experiment.	[1 mark]
5 (a) (ii)	Identify the dependent variable in this experiment.	[1 mark]
5 (b)	Write a suitable hypothesis for this experiment.	[2 marks]



	The target population for this experiment was workers at a car assembly plant. There were more than 100 workers at the plant. The psychologist selected 10 participants, using systematic sampling.
5 (c)	Describe how the psychologist could have used systematic sampling to select 10 participants. Outline <b>one</b> limitation of systematic sampling and explain how this might affect the study.  (Answer in continuous prose.)  [6 marks]
	Extra space
	Question 5 continues on the next page



Each participant took part in both conditions of the experiment.

- In Condition A, each participant had to react once to a ringing bell.
- In Condition B, each participant had to react once to a flashing red light.
- **5 (d)** The psychologist used counterbalancing in this experiment. Outline how this might have been done.

have been done.	[2 marks]

The results of the experiment are shown in **Table 1** below.

**Table 1** Time taken in milliseconds to react to the ringing bell (Condition A) and to the flashing red light (Condition B).

Participant number	Condition A (ringing bell)	Condition B (flashing red light)
1	21	17
2	14	14
3	12	17
4	14	14
5	12	12
6	11	13
7	14	12
8	14	18
9	14	19
10	14	14
Total	140	150



5 (e) (i)	The mean time for Condition (Tick the correct box.)	A is:					
	(TICK the correct box.)					[1 mark]	
		140	milliseconds				
		70	milliseconds				
		14	milliseconds				
5 (e) (ii)	The mean time for Condition (Tick the correct box.)	B is:				[d month]	
		15	milliseconds			[1 mark]	
		29	milliseconds				
			milliseconds				
		11.0					
5 (e) (iii)	What is the range for Condition	on A?				[1 mark]	
5 (e) (iv)	What is the range for Condition	on B?				 [1 mark]	
5 (f)	Using the mean times <b>and</b> the ranges, what conclusions could the psychologist draw from this experiment? Explain your answer.  [4 marks]						
						 	2
	EN	D OF	QUESTIONS				

