5. A manager of a large company is investigating the time it takes the company's employees to complete a task.

The manager believes that the mean time for full-time employees to complete the task is more than a minute quicker than the mean time for part-time employees to complete the task.

The manager collects a random sample of 605 full-time employees and 45 part-time employees and records the times, t minutes, it takes each employee to complete the task.

The results are summarised in the table below.

	n	$\bar{t}$	s^2
Full-time employees	605	5.6	9
Part-time employees	45	7.0	4

(a) Test, at the 5% level of significance, the manager's claim.

You should state your hypotheses, test statistic, critical value and conclusion clearly.

(8)

(b) State two assumptions you have made in carrying out the test in part (a)

(2)

The company increases the size of the sample of part-time employees to 46
The time taken to complete the task by the extra employee is 8 minutes.

(c) Find an unbiased estimate of the variance for the sample of 46 part-time employees.

(4)

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Question 5 continued

(Total for Question 5 is 14 marks)