

Question 7**(9 marks)**

The Carnaby's Black Cockatoo is a bird native to southwest Australia. A birdwatcher is interested in estimating the proportion, p , of birds living in a Western Australian national park that are Carnaby's Black Cockatoos. The birdwatcher visited the national park one morning and, standing at their favourite bird-watching location, observed 200 birds flying past. Seventy-six of those birds were Carnaby's Black Cockatoos.

- (a) On the basis of the sample, determine a point estimate for p . (1 mark)
- (b) On the basis of the sample, determine a 95% confidence interval for p . (2 marks)
- (c) What is the minimum number of birds that would need to be sampled to ensure that the margin of error of the 95% confidence interval for p is at most 0.02? (2 marks)

(d) Identify and explain **two** sources of bias in the birdwatcher's sampling method. (4 marks)