**4.** A pet shop sells bags of birdseed.

The weight, $B$ kilograms, of birdseed in a bag can be modelled by a Normal distribution with unknown mean $\mu$ and known standard deviation 0.9

The birdseed in each of 28 bags in a random sample from a large batch is weighed. The total weight of birdseed in these 28 bags is found to be 335.6 kg

For this batch,

(a) find a 98% confidence interval for the mean weight of birdseed in a bag.

**(4)**

(b) Explain why the use of the Central Limit theorem is not required to answer part (a)

**(1)**

The manufacturer claims that the birdseed in each bag in this batch has a mean weight of 12 kg

(c) Using the answer to part (a), comment on the claim made by the manufacturer.

**(1)**

The pet shop also sells bags of nuts.
The weight, $T$ kilograms, of nuts in a bag can be modelled by a Normal distribution with mean 5 kg and standard deviation 0.3 kg

A customer purchases $n$ bags of nuts.

For these $n$ bags $\mathrm{P}\left(\overline{T} < 5.07\right) = 0.8829$ to 4 decimal places.

(d) Find the value of $n$

**(4)**

**(Total for Question 4 is 10 marks)**