

A scientist is investigating the size of shells at various beach locations. She selects four beach locations and takes a random sample of shells from each of these beaches. She classifies each shell as large or small. Her results are summarised in the following table.

| | | Beach location | | | | |
|---------------|-------|----------------|----------|----------|----------|-------|
| | | <i>A</i> | <i>B</i> | <i>C</i> | <i>D</i> | Total |
| Size of shell | Large | 68 | 69 | 96 | 81 | 314 |
| | Small | 28 | 55 | 64 | 39 | 186 |
| Total | | 96 | 124 | 160 | 120 | 500 |

Test, at the 10% significance level, whether the size of shell is independent of the beach location. [7]