**Question 24** (7 marks)

A researcher conducted a field experiment to determine the effects of planting density on the yield of cauliflowers.

Three planting densities were used:

Treatment A – 20 cm spacing between plants

Treatment B – 50 cm spacing between plants

Treatment C – 80 cm spacing between plants

The researcher prepared 36 trial plots of equal size. Mean yields (grams/cauliflower) for each of the treatments and the position of each plot are shown. The soil texture trend and gradient of the field are also shown.

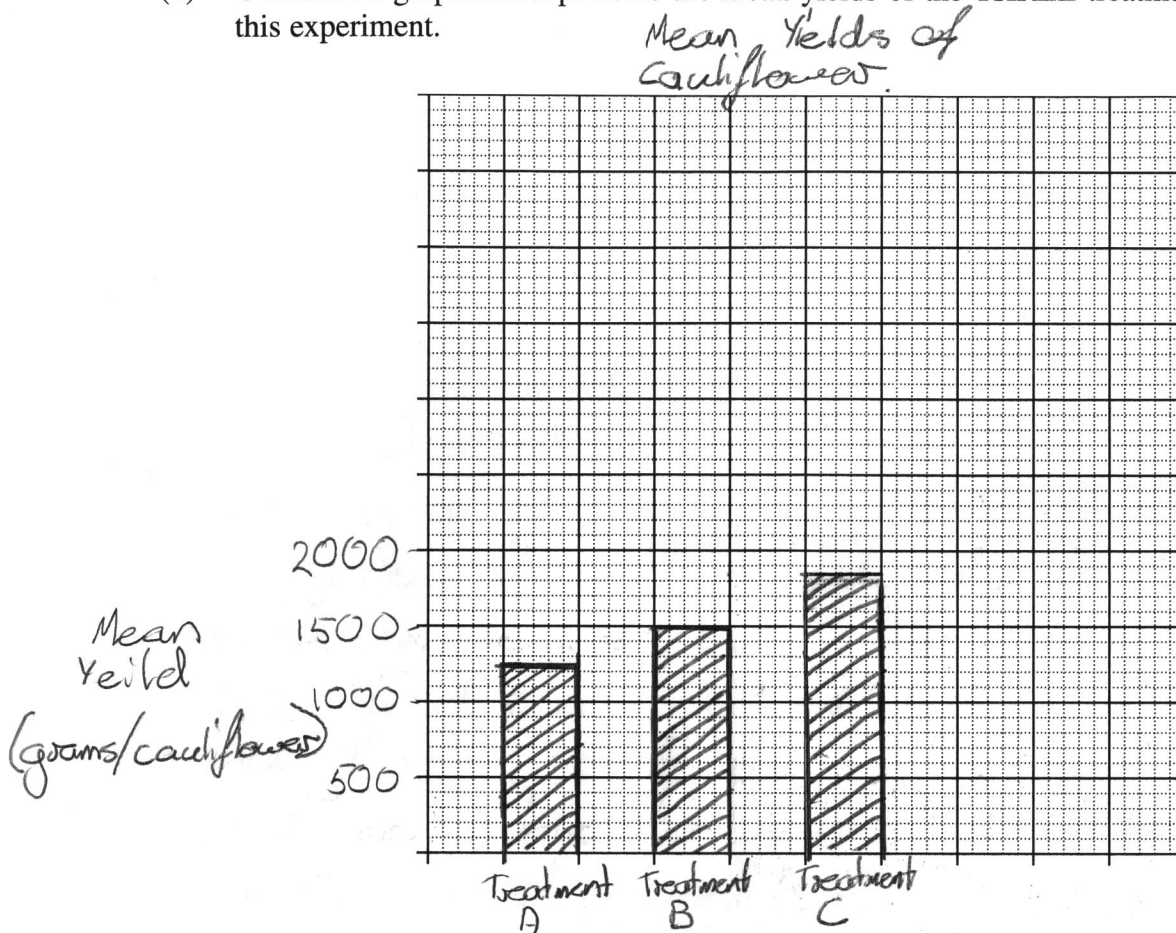| Gradient | | | | | | | Soil texture | |
|---|---|---|---|---|---|---|---|---|
| | A | A | A | A | A | A | | Mean yield treatment A $\bar{x} = 1250$ g |
| Top of slope | A | A | A | A | A | A | Sandy loam | |
| | B | B | B | B | B | B | | Mean yield treatment B $\bar{x} = 1500$ g |
| Mid–slope | B | B | B | B | B | B | Clay loam | |
| | C | C | C | C | C | C | | Mean yield treatment C $\bar{x} =1850$ g |
| Bottom of slope | C | C | C | C | C | C | Clay | |

(a) Which treatment in this experiment is most likely to produce the greatest number of cauliflowers?　　1

_Treatment C._

**Question 24 continues on page 15**

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Question 24 (continued)

(b)   Construct a graph that represents the mean yields of the THREE treatments in      **3**
this experiment.

Mean Yields of
Cauliflower.

Mean
Yeild
(grams/cauliflower)

2000
1500
1000
500

Treatment   Treatment   Treatment
A           B           C

(c)   Explain how an alternative experimental design for this experiment may      **3**
improve the validity of the results.

In this experiment the researcher
should have used control variables,
E.g. the type of gradient, soil
texture, amount of moisture and
sunlight should all be the same

**End of Question 24**