Probability – 2021/20 GCE AS Statistics Further Mathematics A

1. Nov/2021/Paper_Y532/01/No.7

The 20 members of a club consist of 10 Town members and 10 Country members.

(a) All 20 members are arranged randomly in a straight line.

Determine the probability that the Town members and the Country members alternate. **[4]**

(b) Ten members of the club are chosen at random.

Show that the probability that the number of Town members chosen is no more than r, where $0 \leqslant r \leqslant 10$, is given by

$$\frac{1}{N}\sum_{i=0}^{r}({}^{10}C_i)^2$$

where N is an integer to be determined. **[4]**

2. Nov/2020/Paper_Y532/01/No.7

A bag contains $2m$ yellow and m green counters. Three counters are chosen at random, without replacement. The probability that exactly two of the three counters are yellow is $\frac{28}{55}$.

Determine the value of m. **[7]**