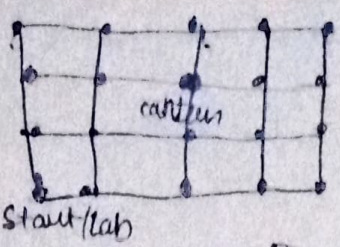
Nikhil SG,
BDA
2410580224

1)



a) to reach from lab to ATM we should move through blocks up or right
the steps required for moving from lab to ATM 3 ups and 4 rights
considering 7 slots choosing 4 rights of them without replacement and order does not matter

$^{7}C_{4} = 35$ ways for moving from lab to ATM

b) to reach ATM from lab without going to canteen.
no of ways to reach canteen from lab.
2 ups and 2 rights. in the same way we have

$^{4}C_{2}$ (and)

no of ways to reach ATM from canteen 2 right 1 up

$^{3}C_{2}$

these are combined ways to go to ATM from lab through canteen $\left(^{4}C_{2} \times {}^{3}C_{2}\right)$.

$^{7}C_{4} - \left(^{4}C_{2} \times {}^{3}C_{2}\right)$

↑ Total ways

↑ ways to go to ATM through canteen.

2)

Mr brown. tablets A and tablet B

choose, 10, 9, 11 100 tablet price of type B

1 mg each → 10 ← 10 →

100 tablet price of type A → divide each into 10 price 0.1 mg each → same → 200 tablet prices to take 20 out of them randomly.

Safe dosage range 0.9 to 1.1

choose 10, 9, 11

$$\left(\frac{^{100}C_{10} \times {}^{100}C_{10}}{^{200}C_{20}}\right) + \left(\frac{^{A}100C_{11} \times {}^{B}100C_{9}}{^{200}C_{20}}\right) + \left(\frac{^{A}100C_{9} \times {}^{B}100C_{11}}{^{200}C_{20}}\right) \approx 52$$

Mr brown after breaking each tablet into 10 more pcs each may not lead up into serious health issues.