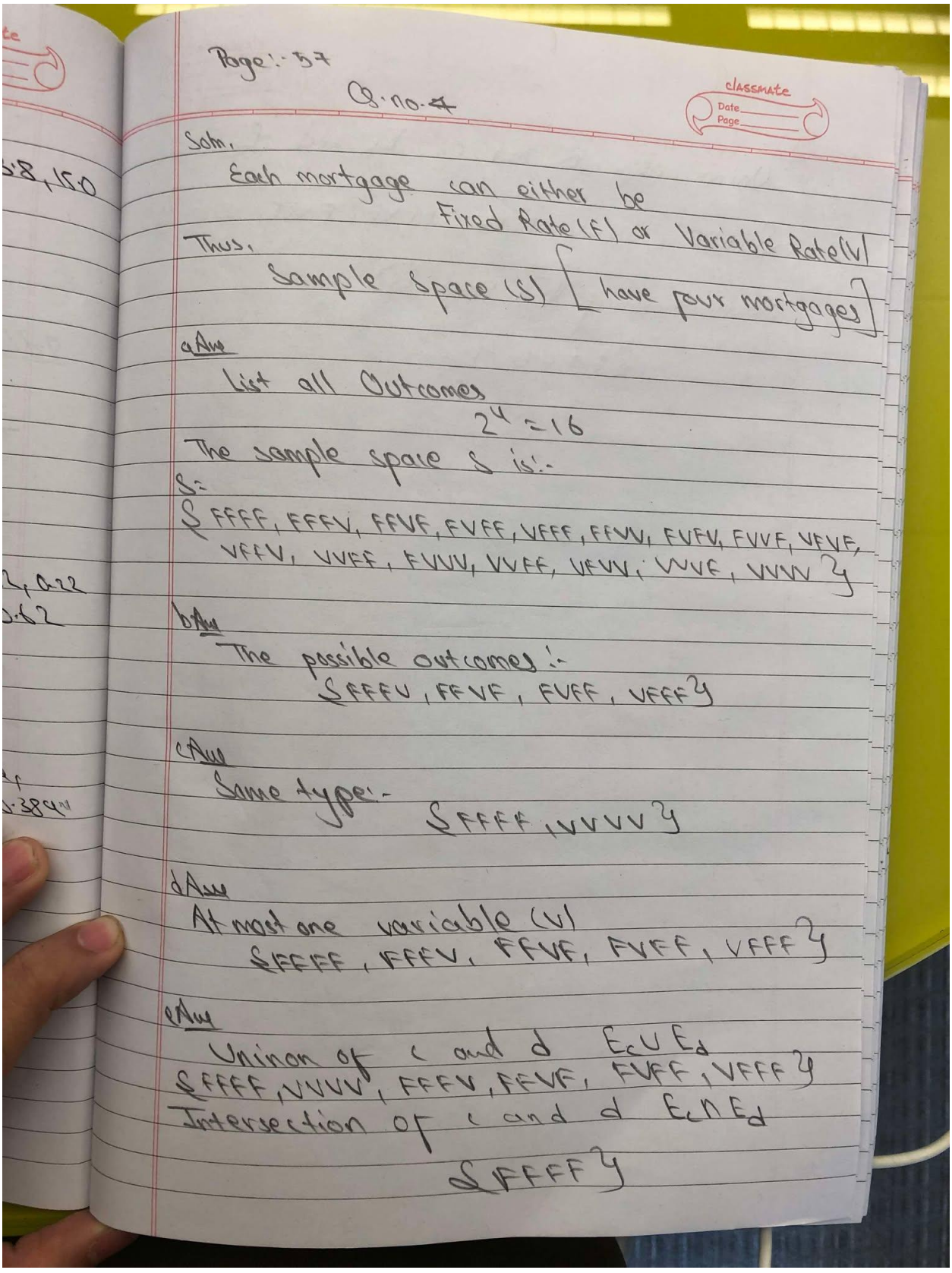


Page:- 37

Q.no-4

Soln.

Each mortgage can either be Fixed Rate (F) or Variable Rate (V)

Thus,

Sample Space (S) [have four mortgages]

a Ans

List all Outcomes

$2^4 = 16$

The sample space S is:-

S:

S FFFF, FFFV, FFVF, FVFF, VFFF, FFVV, FVFV, FVVF, VFVF, VFFV, VVFF, FVVV, VVFF, VFVV, VVVF, VVVV }

b Ans

The possible outcomes :-

{FFFV, FFVF, FVFF, VFFF}

c Ans

Same type:-

{FFFF, VVVV}

d Ans

At most one variable (V)

{FFFF, FFFV, FFVF, FVFF, VFFF}

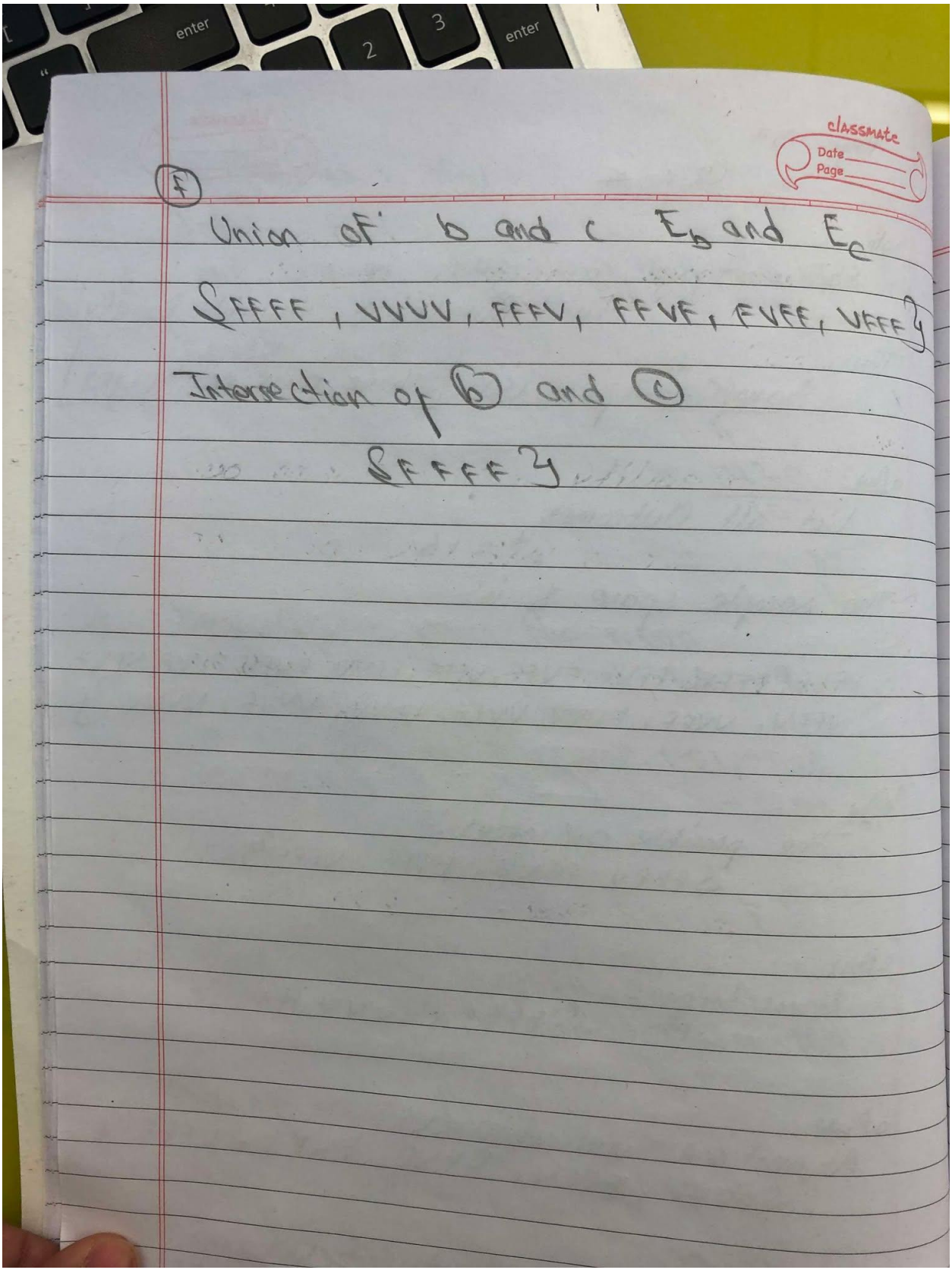
e Ans

Union of c and d $E_c \cup E_d$

{FFFF, VVVV, FFFV, FFVF, FVFF, VFFF}

Intersection of c and d $E_c \cap E_d$

{FFFF}



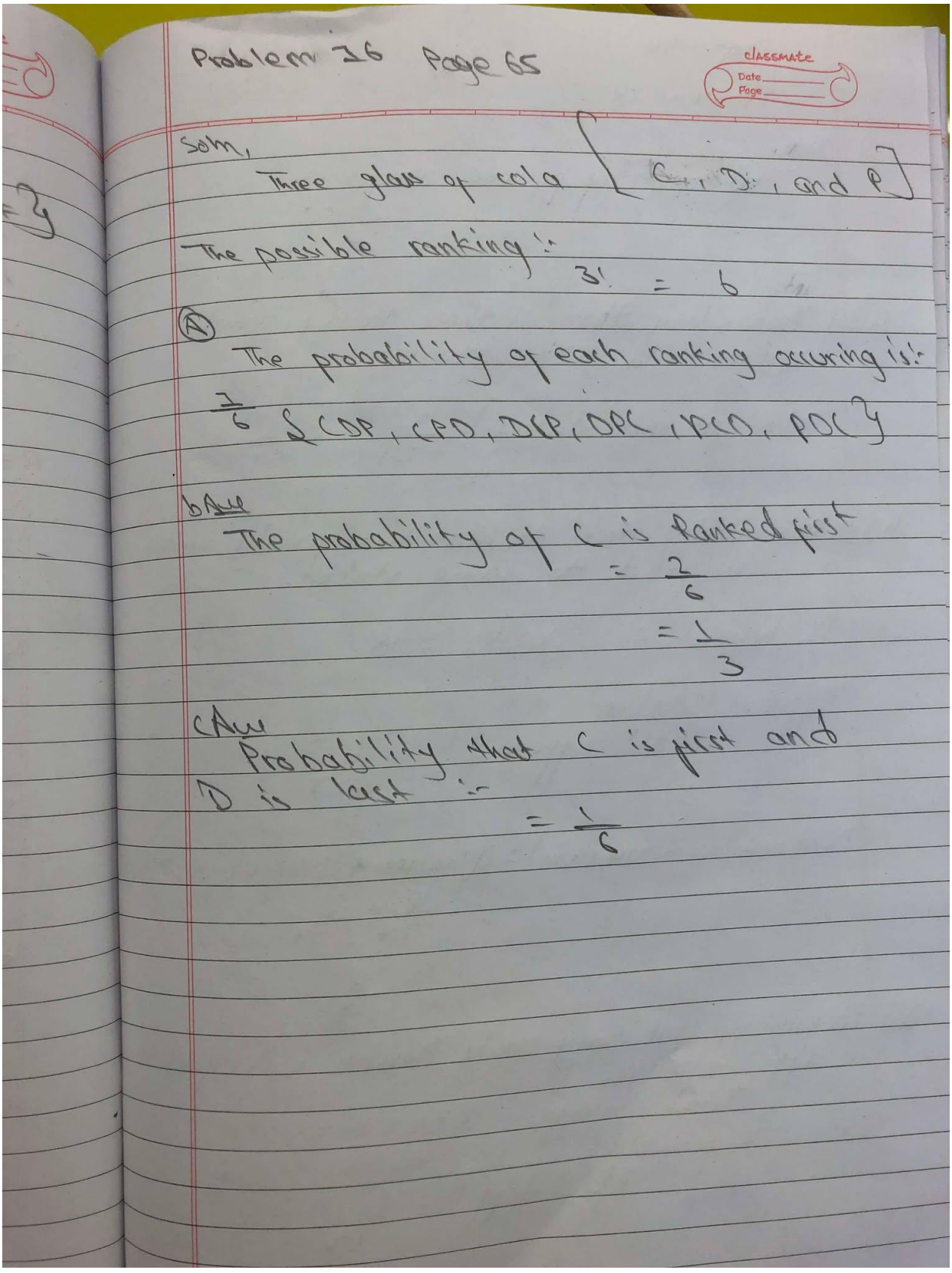
(f)

Union of b and c E_b and E_c

{FFFF, VVVV, FFFV, FFVF, FVFF, VFFF}

Intersection of (b) and (c)

{FFFF}



Problem 36 Page 65

Soln,

Three glass of cola [C, D, and P]

The possible ranking :-

$3! = 6$

(A)

The probability of each ranking occurring is:-

$\frac{1}{6}$ {CDP, CPD, DCP, DPC, PCD, PDC}

bAns

The probability of C is Ranked first

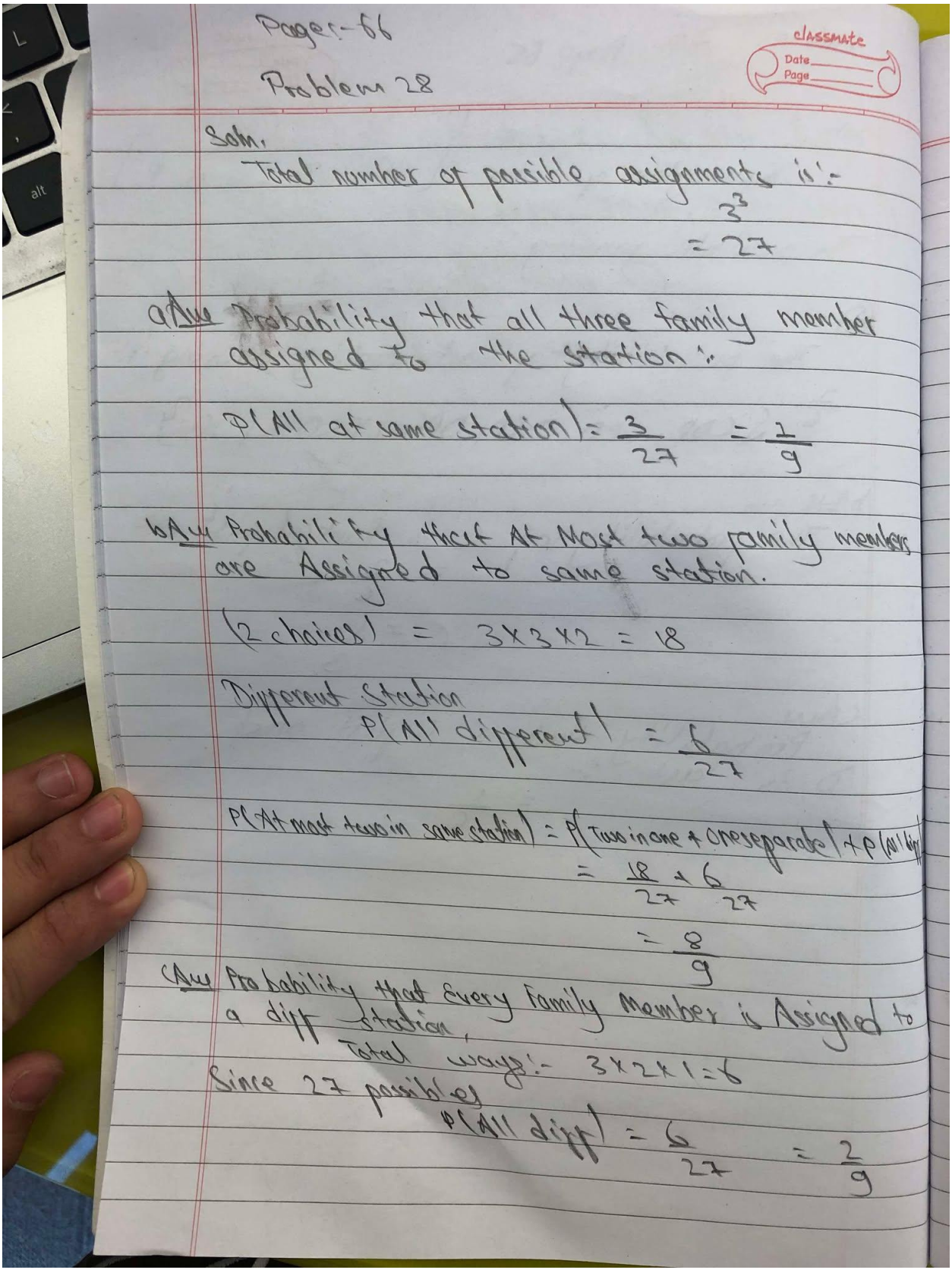
$= \frac{2}{6}$

$= \frac{1}{3}$

cAns

Probability that C is first and D is last :-

$= \frac{1}{6}$



Page:- 66

Problem 28

Soln.

Total number of possible assignments is:-

$$3^3 = 27$$

a) Ans Probability that all three family member assigned to the station:-

$$P(\text{All at same station}) = \frac{3}{27} = \frac{1}{9}$$

b) Ans Probability that At Most two family members are Assigned to same station.

(2 choices) $= 3 \times 3 \times 2 = 18$

Different Station

$$P(\text{All different}) = \frac{6}{27}$$

$$P(\text{At most two in same station}) = P(\text{Two in one + One separate}) + P(\text{All diff})$$

$$= \frac{18}{27} + \frac{6}{27}$$

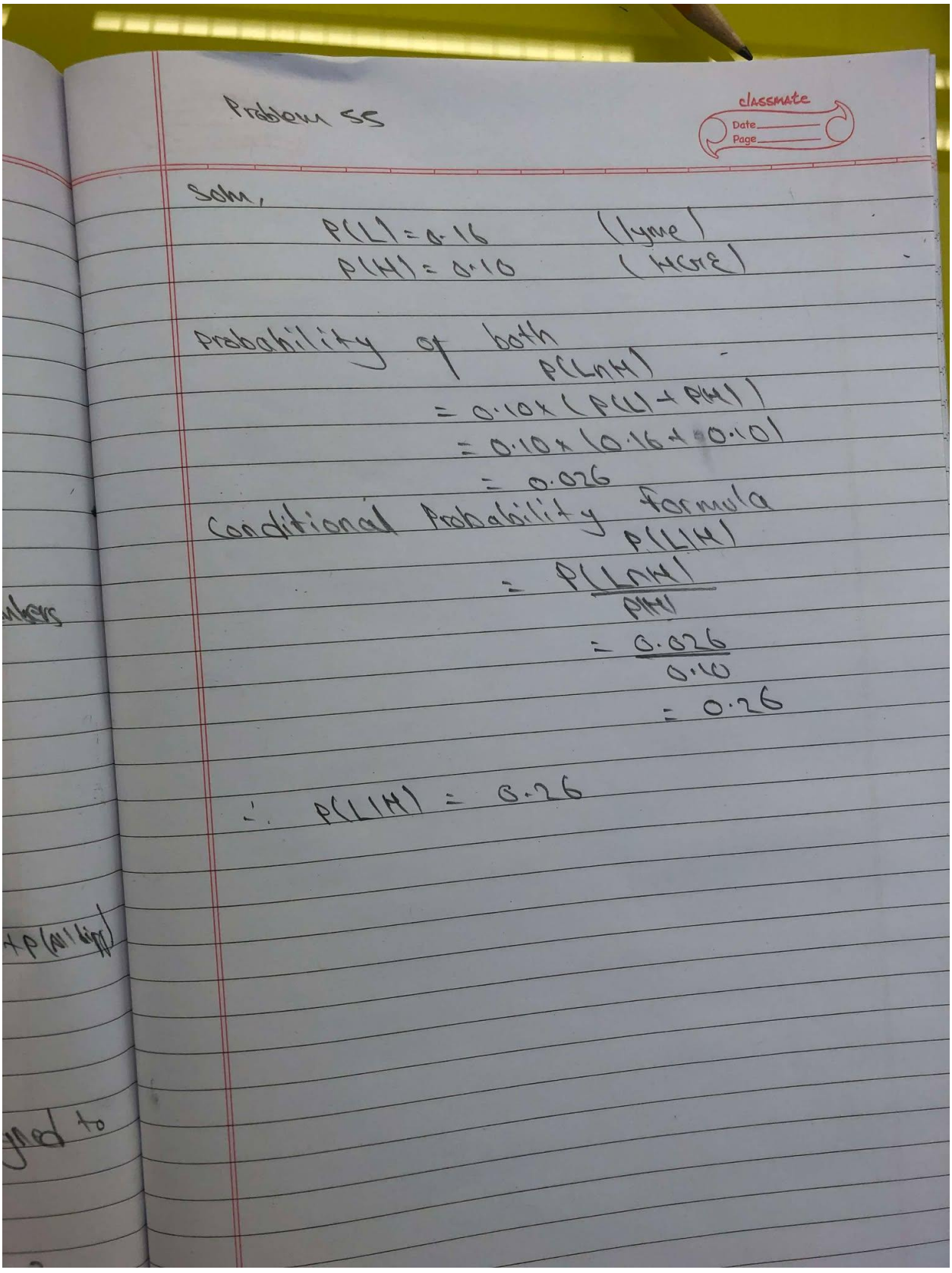
$$= \frac{8}{9}$$

c) Ans Probability that Every family member is Assigned to a diff Station,

Total ways:- $3 \times 2 \times 1 = 6$

Since 27 possibles

$$P(\text{All diff}) = \frac{6}{27} = \frac{2}{9}$$



Problem 55

Soln,

$P(L) = 0.16$ (Lyme)

$P(M) = 0.10$ (Mice)

Probability of both

$P(L \cap M)$

$= 0.10 \times (P(L) + P(M))$

$= 0.10 \times (0.16 + 0.10)$

$= 0.026$

Conditional Probability formula

$P(L|M)$

$= \frac{P(L \cap M)}{P(M)}$

$= \frac{0.026}{0.10}$

$= 0.26$

$\therefore P(L|M) = 0.26$