Advanced Capital Budgeting Decisions

Class 1

- Inflation and Capital Budgeting
- Adjusted present Value → MM model (capital structure)
  - ↳ also covered in Business Valuation
- Replacement Decision (Tough Sums)
- Risk Analysis
- Theory topics

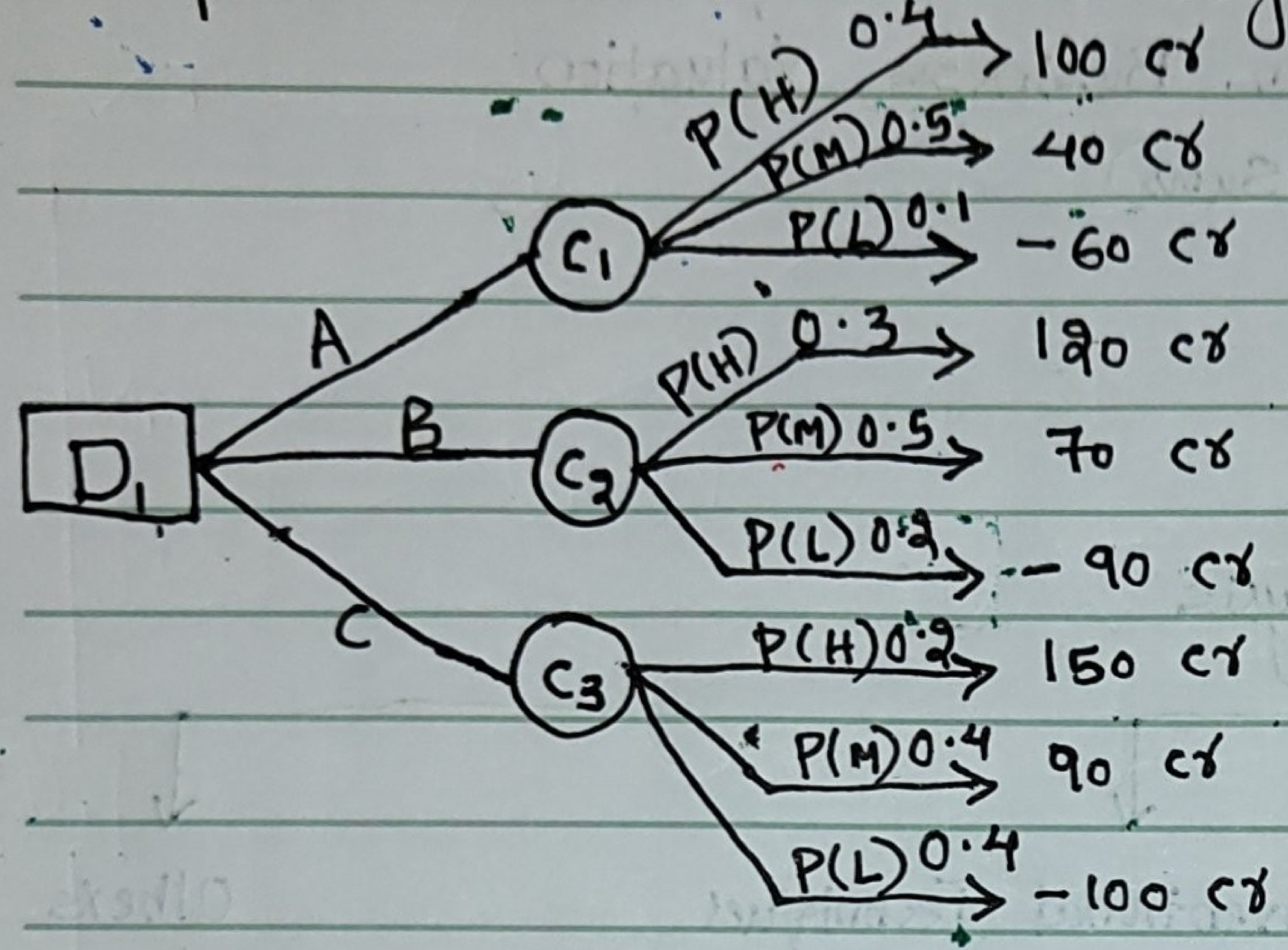
Risk Analysis

- **Statistical Techniques**
  - Expected
  - S.d.
  - C.V.
  - } Higher level than Inter
- **Conventional Techniques**
  - Certainty Equivalent
  - RADR
  - → Same as Inter
- **Others**
  - Sensitivity Analysis
  - Scenario
  - Simulation
  - Decision tree

→ Decision Tree Analysis

- Decision making
  - ↳ choosing one alternative out of a no of alternatives.
- Decision Tree
  - ↳ Graphical Depiction of decision making
  - ↳ Nodes and branches out of nodes
  - ↳ Notes
    - Box □ → Decision node → Alternatives will come out
    - Circle ○ → Chance Node → outcomes with probability

Eg:- (Simple Sum) A Company is planning to launch either product A, or B or C Since they are mutually exclusive. The profitability of these products depends on the demand (i.e.. High, Medium, Low)

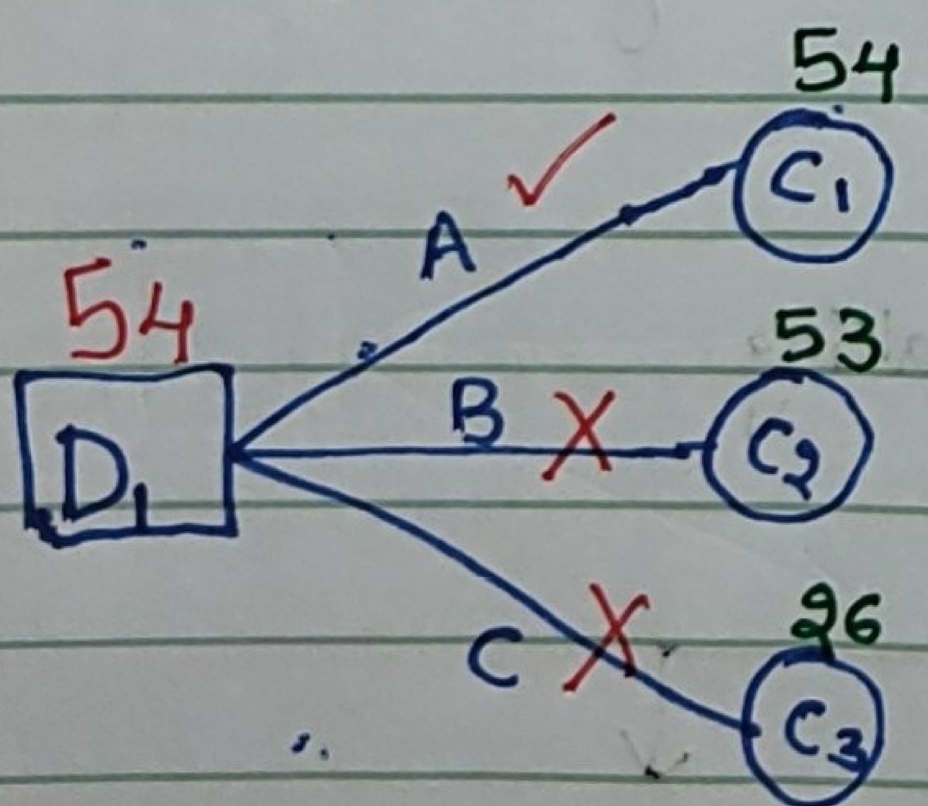


Using the above data, Suggest the Company on which product they should launch?

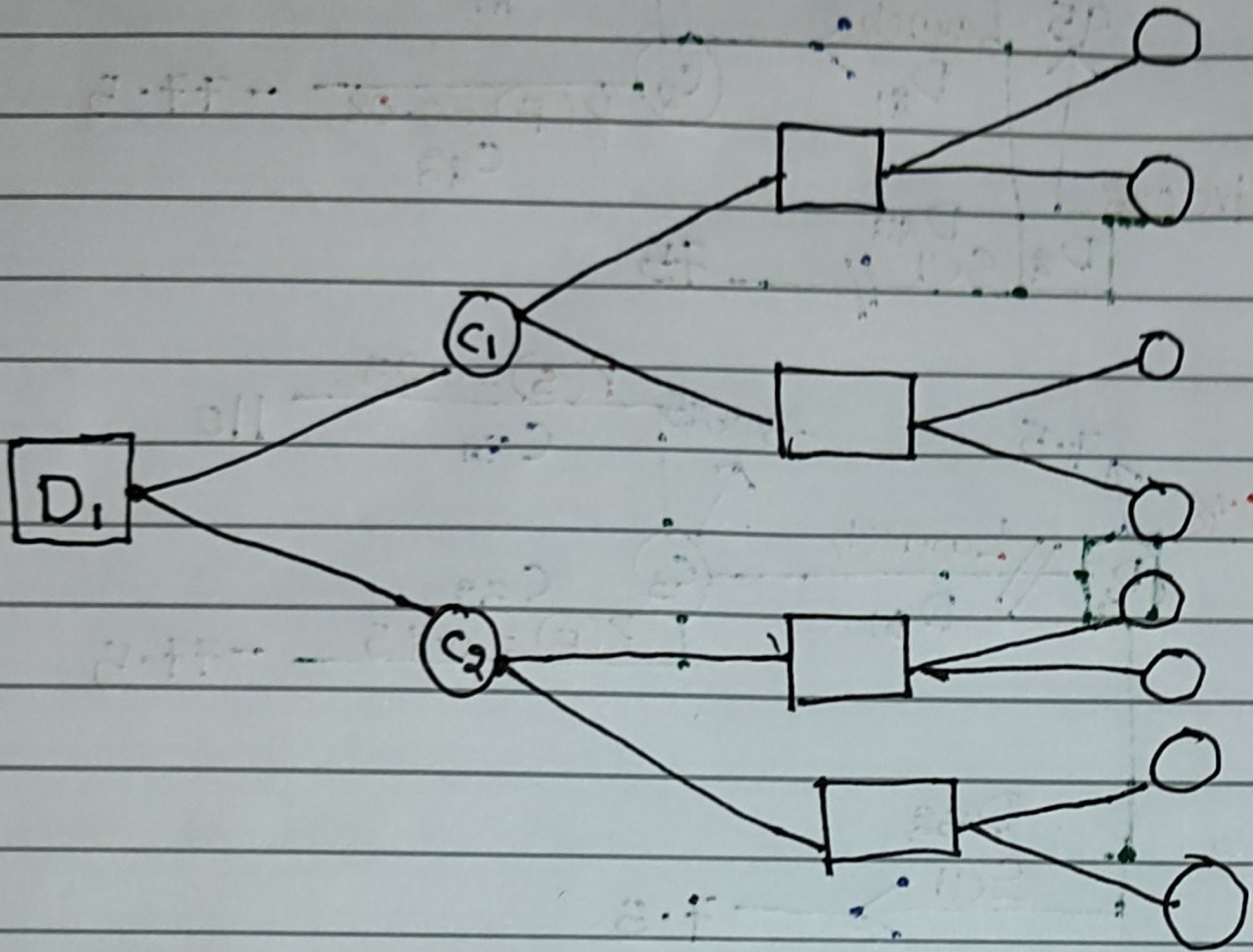
Expected Monetary Value (EMV) at C_1 $=(100\times0.4)+(40\times0.5)+(-60\times0.1)$
$= 54$

EMV at C_2 $= (0.3\times120 \text{ cr}) + (0.5\times70) + (0.2\times-90) = 53$

EMV at C_3 $= (0.2\times150) + (0.4\times90) + (0.4\times-100) = 26$



→ Eg:- Exam → Sequential decision making



A Story will be given we have to draw the decision tree using the Story.

Why difficult ?

- Story + probability + Calculation of NPV

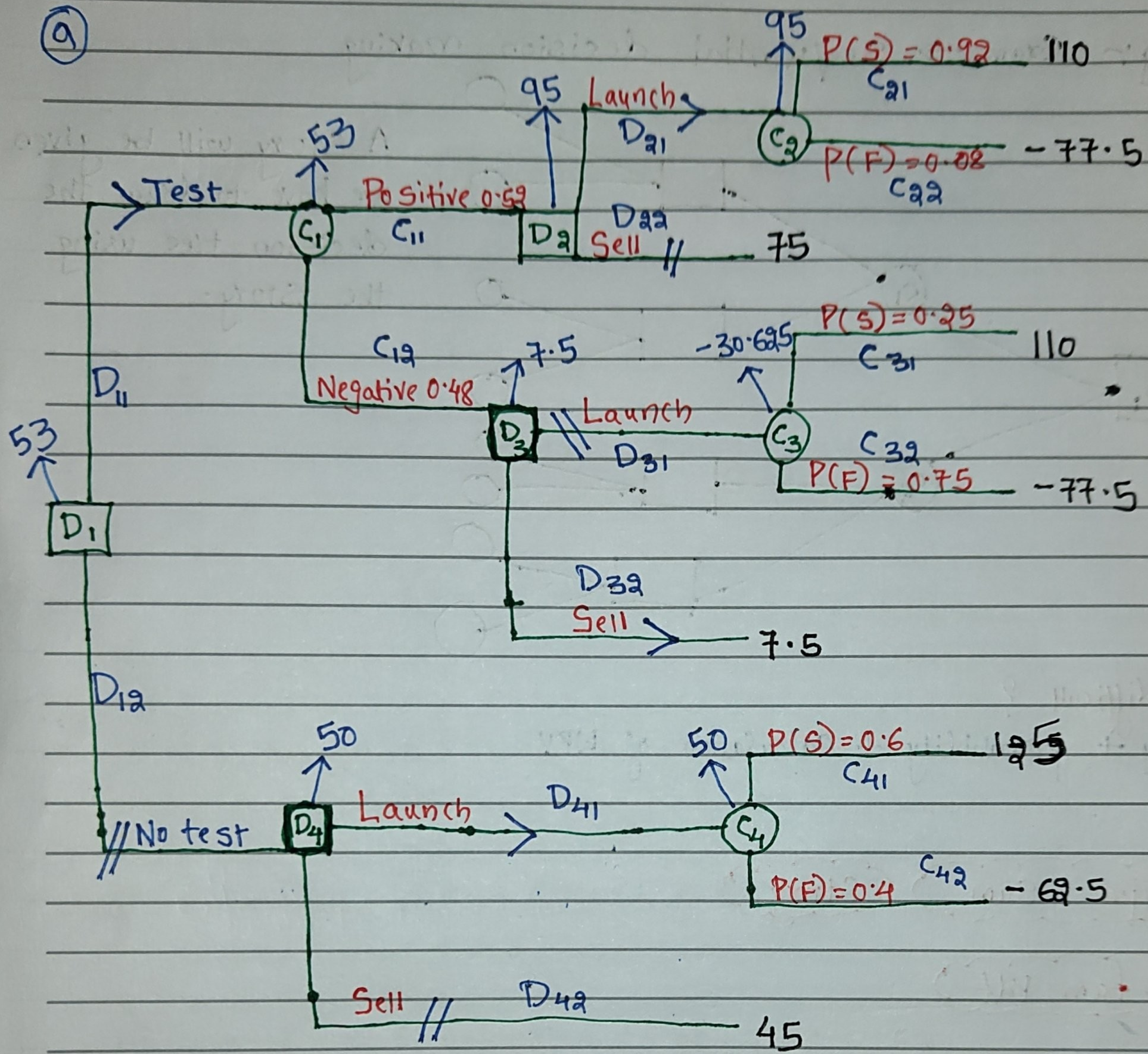
→ Type 1 Sum

Story:

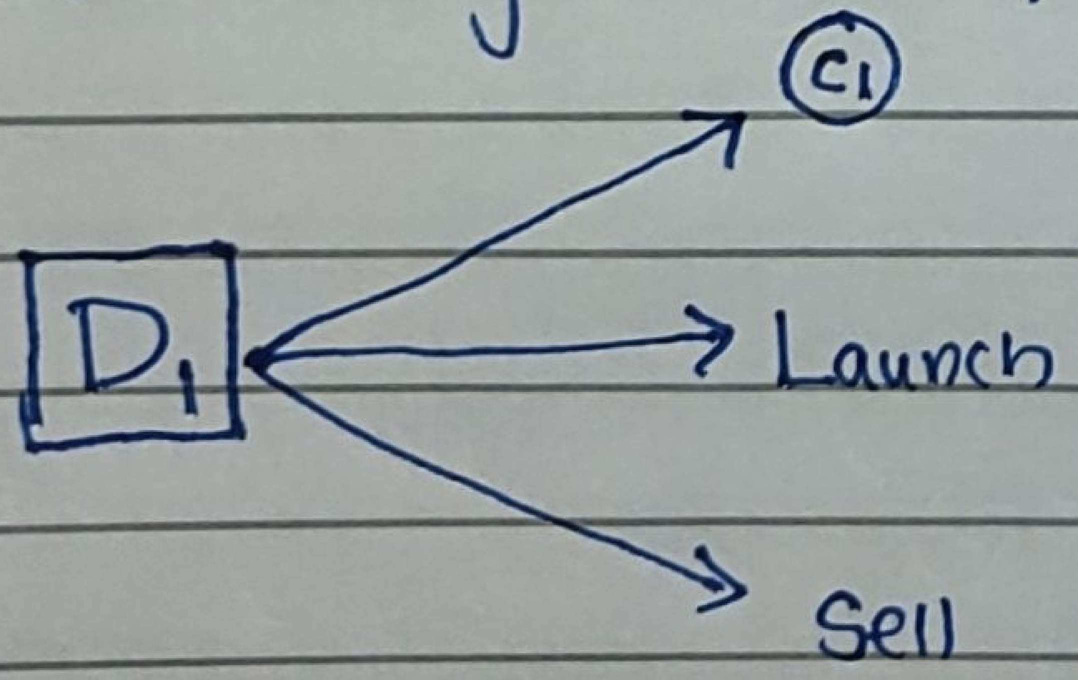
Q.1 from Pdf

$\frac{C_2}{95}$

(9)



Note :- Alternatively From D_1 we can draw three branches



and draw further branches from C_1 (same as above)

(b)

EMV at C_2 = $(0.92 \times 110) + (0.08 \times -77.5)$ = 95

EMV at D_2 = If launch 95, If sell 75 } So launch @ 95

Max [95, 75] = 95

EMV at C_3 = $(0.25 \times 110) + (0.75 \times -77.5) = -30.625$

EMV at D_3 = Max [−30.625, 7.5] = 7.5

EMV at C_4 = $(0.6 \times 125) + (0.4 \times -62.5)$ = 50

EMV at D_4 = Max [50, 45] = 50

EMV at C_1 = $(0.52 \times 95) + (0.48 \times 7.5)$ = 53

EMV at D_1 = Max [53, 50] = 53

Decision :- $D_1 \rightarrow$ Test, $D_2 \rightarrow$ Launch } Expected NPV = 53 lakhs

Initially we will conduct a test, if the result is positive, we will launch. If the result is negative, we will sell the rights

c. Also compute the S.d. of NPV at the optimal decision

NPV (x)	Prob (P)	PX	$P(X-\bar{X})^2$
110	0.4784	52.62	1554.32
-77.5	0.0416	-3.22	708.46
7.5	0.48	3.6	993.72
	1	53	3256.5

$0.4784 = 0.52 \times 0.92$

$0.0416 = 0.52 \times 0.08$

→ other NPV we have cancelled (II), so we didnot select them

Expected NPV $(\bar{X}) = \Sigma PX = 53$

S.d of NPV $= \sqrt{\Sigma P(X-\bar{X})^2} = \sqrt{3256.5} = \underline{57.07}$

$C.V = \frac{S.d}{mean} \times 100 = \frac{57.07}{53} \times 100 = 107.67\%$.