② option strategies

1 Straddles → Buy Call & put at same EP

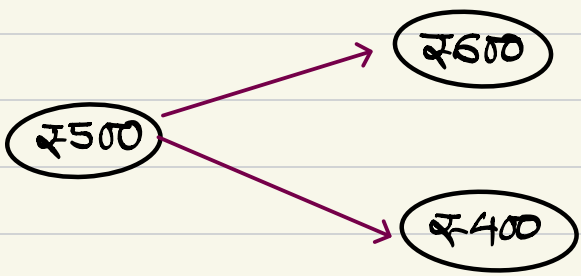
2 Strangles → Buy call & put at different EP

③ Expected Value of option

= Σ Gross payoff (x) probability

④ option pricing

1 Binomial Model [Single period]



E = ₹510
Call option
r = 10% p.a.
t = 1 year

Method I Risk Neutral probability Approach

Step 1 Calculate Risk Neutral probability

$$500 \times 1.10 = 600P + 400(1-P)$$

$$P = 0.75 \quad \text{"Or"}$$

$$P = \frac{R-d}{u-d} = \frac{1.10-0.80}{1.20-0.80} = 0.75$$

Step 2 Value of Call

$$C_0 = \frac{(90 \times 0.75) + (0 \times 0.25)}{1.10} = ₹61.36$$

$$P_0 = \frac{(0 \times 0.75) + (110 \times 0.25)}{1.10} = ₹25$$

Method II Delta Hedging or Binomial model

Call option

Step 1 Calculate Delta of Call

$$\text{Delta} = \frac{\Delta \text{ option value}}{\Delta \text{ share price}} = \frac{90 - 0}{600 - 400} = 0.45$$

Step 2 Combination → Write 1 Call option & Buy 0.45 share

Step 3 Cash flows on maturity in both situation

	600	400
Sell share	$(600 \times 0.45) = 270$	$(400 \times 0.45) = 180$
Call payoff	Exercised = (90)	Lapsed = 0
	CI 180	180

Step 4 Value of Call → PVCO = PVCI

$$₹500 \times 0.45 - Co = \frac{180}{1.10}$$

$$Co = ₹61.36$$

Put option

Step 1 Delta of put $= \frac{110 - 0}{600 - 400} = 0.55$

Step 2 Write 1 put & short sell 0.55 share

Step 3 Cash flow on Maturity

	600	400
Buy share	$(600 \times 0.55) = 330$	$(400 \times 0.55) = 220$
put payoff	Lapsed 0	Exercised = 110
	C.O. 330	330