Step 4 $(500 \times 0.55) + P_0 = \frac{330}{1.10}$

$= ₹25$

2. Put Call Parity [Combination of Call & put]

Value of Call or put is given [Suppose $C_0 = 61.36$]

$S_0 + P_0 = C_0 + PV \text{ of } EP$

$500 + P_0 = 61.36 + \frac{510}{1.10}$

$P_0 = ₹25$

Two period Risk Neutral Model

Step 1 Binomial Tree ⟶ Divide option period into 2 periods.

Step 2 Calculate Risk Neutral probability for each node

Step 3 Calculate Gross payoff for each node

Step 4 Compare present value of Gross payoff & Intrinsic Value of such node. take Higher of Two as Value of option at that node.

☞ In two period Binomial model, assume American option if question Silent. Value of option, always risk neutral method.

3. BLACK SCHOLES MODEL

Step 1 Calculate d_1 & d_2

$$d_1 = \frac{\ln \frac{S_0}{E} + (r + \frac{\sigma^2}{2})t}{\sigma\sqrt{t}}$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

Step 2 N(d1) & N(d2)

Using Normal distribution table, always cumulative area, if tail area is given then [1 - tail area].

If d1 or d2 is negative, then tail area.

Step 3 Value of option

$$C_0 = S_0 \times N(d_1) - \frac{E}{e^{rt}} \times N(d_2)$$

$$P_0 = \frac{E}{e^{rt}} \times N(-d_2) - S_0 \times N(-d_1)$$

☞ If dividend is given in question then take adjusted stock price in place of S_0

Adjusted Stock price = S_0 - PV of dividend

REAL option

(1) Abandonment option

PV of proposal = ₹100

YEAR 1 Disposal Value = ₹80

r = 8%

₹130

₹60

Step 1 Risk Neutral probability

$$100(1.08) = 130P + 60(1-P)$$

$$P = 0.686$$

Step 2 Value of abadonment option

$$\text{Value} = \frac{(0 \times 0.686) + (20 \times 0.314)}{1.08} = 5.81$$