Q1] Given, forward price = $2050

Spot Price = [1400, 1500, 1560, 1600, 1800, 2050, 2200, 2300, 2400]

Contract size = 1,000 ounces

~~Formula~~

$$\text{Profit / Loss} = (\text{Forward Price} - \text{Spot Price}) \times 1000$$

May - 2024 Spot price ($)	Profit / Loss ($)
1400	(2050 - 1400) × 10³ = 650,000
1500	550,000
1600	450,000
1800	250,000
2050	0
2220	-150,000
2300	-250,000
2400	-350,000

Feature / Definition	SPOT CONTRACT	FEATURE CONTRACT
(i)	A contract to buy/sell an asset immediately at the current market price	A contract to buy/sell an asset at a future date at a agreed price
(ii)	Settlement is done immediately	Settlement happens on the agreed date
(iii)	Based on the current market price (Spot price)	Based on expected future price
(iv)	Usually for actual ownership and deliver	Used for hedging or speculation

How a future contract works on a commodity exchange

- Its a an agreement to buy/sell a commodity at a fixed price on a future date.
- Traders take position: Long (buy) or Short (sell)
- Require an initial margin and is settled daily (mark-to market)

3] Role of Commodity Exchange

- Standardizes contracts
- Provides a trading platform and ensures price transparency
- Act as a clearing house, managing risk and daily settlements
- Ensure smooth settlement and delivery (physical or cash)
- Regulates and enforces market integrity

Q4| Given,

1) Option type = European put

2) Premium (cost of option) = $3

3) Strike Price (K) = $40

4) Stock Price today (S_0) = $42

5) Can be exercised only at maturity

(1)

The investor makes profit when

Profit = max(K − ST, 0) − Premium > 0

This happens when

ST < K − Premium = 40 − 3 = 37

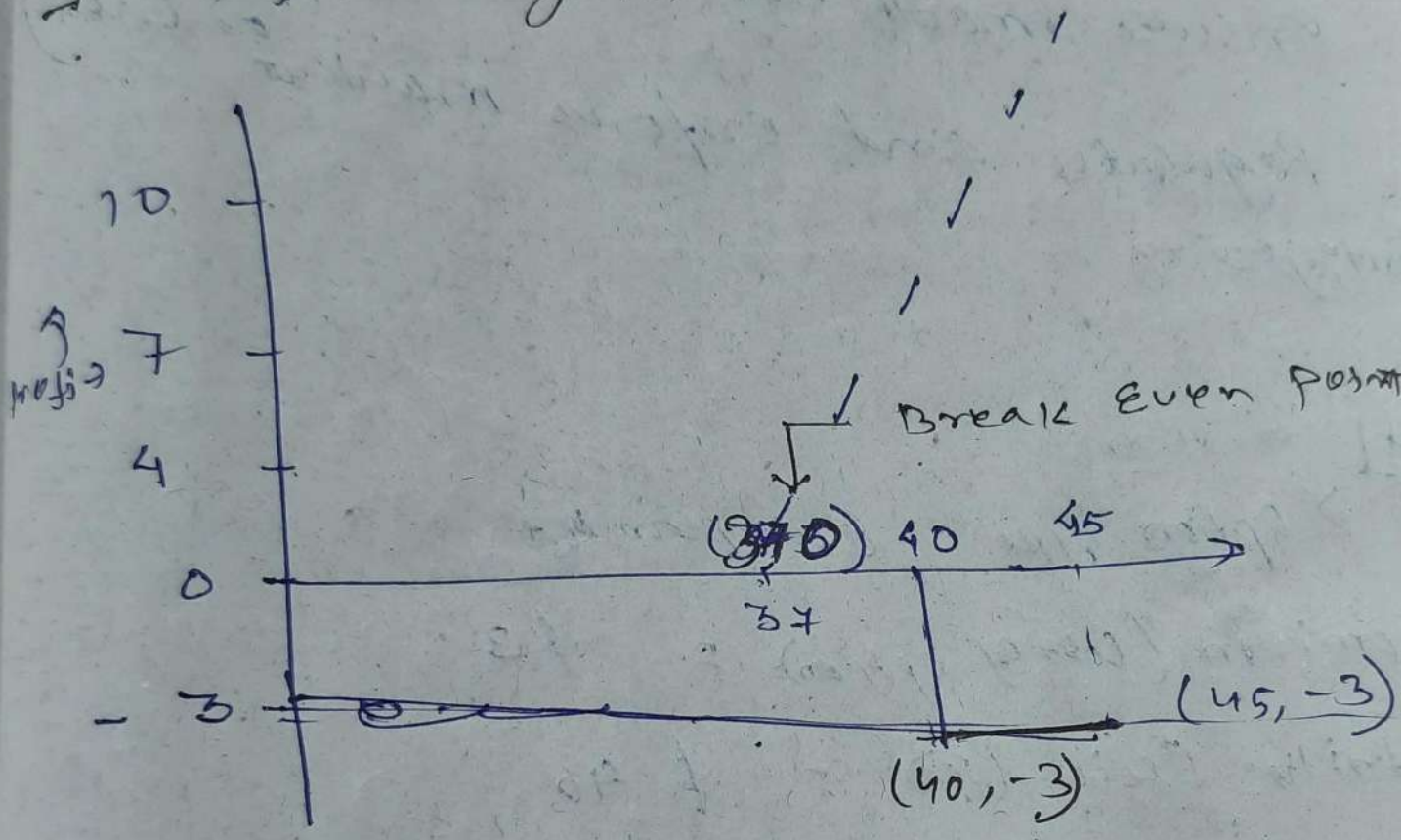
(1) Thus profit when stock price at maturity is below $37

2) Options is exercised when

$$K - S_T > 0 \Rightarrow S_T < K = \$40$$

Thus, when stock price is below $40

3) Profit Diagram



Stock price at maturity $\rightarrow$ S_T

$$(x, y) = (S_T, \text{Profit})$$

Stock Price	Profit
30	-
35	7
34	2
40	0
42	-3
45	-3
	-3

86] Call price is

$$C - P = S - Ke^{-rT}$$

$$\Rightarrow \quad 20 - 5 = 130 - 120e^{-r}$$

$$15 = 130 - 120e^{-r}$$

$$120e^{-r} = 130 - 15 = 115$$

$$e^{-r} = \frac{115}{120} = 0.9583$$

$$r = 0.0426$$

Ans: Implied Risk free Rate = 4.26% p.a.