Assignment 2.2 Solutions of Q3 and Q4

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3. Futures vs Spot Contracts (10 marks)

Difference between Futures and Spot Contracts:

- A **futures contract** is an agreement to buy or sell an asset at a predetermined price at a specific time in the future.
- A **spot contract** is an agreement to buy or sell an asset immediately at the current market price (spot price).

How a Futures Contract Works on the Commodity Exchange:

- Futures contracts are traded on organized exchanges.
- Each contract is standardized in terms of quantity, quality, and delivery date.
- Buyers and sellers enter into the contract through the exchange and are required to post **margin** (collateral).
- Daily gains and losses are settled through **mark-to-market** process.

Role of the Commodity Exchange:

- Acts as an intermediary and clearinghouse.
- Ensures both parties meet obligations.
- Reduces counterparty risk.
- Facilitates smooth trading, settlement, and delivery of the commodity.

4. European Put Option (30 marks)

Given:

- Option Type: European Put
- Premium (Cost of the Option): \$3
- Strike Price: \$40
- Current Stock Price: \$42

(a) Under what circumstances does the investor make a profit?

The investor makes a profit if the value received from exercising the put option (i.e., selling the stock at the strike price) is more than the cost of the option.

Condition for profit:

$$\text{Profit} = \max(40 - S_T, 0) - 3 > 0$$

$$\Rightarrow S_T < 37$$

So, the investor makes a profit if the stock price at maturity is less than \$37.

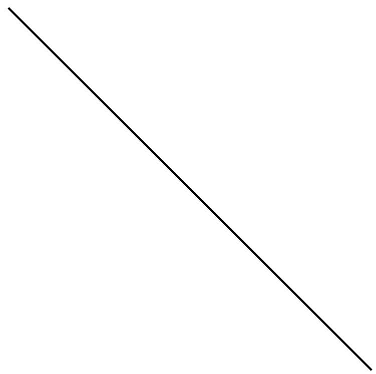
(b) Under what circumstances will the option be exercised?

A European put option is exercised only at maturity. It will be exercised if the stock price is below the strike price at that time.

Condition for exercising the option:

$$S_T < 40$$

(c) Profit Diagram



Explanation:

- For $S_T < 37$, the investor earns profit.
- For $37 < S_T < 40$, the investor exercises the option but incurs a net loss (loss is smaller than \$3).
- For $S_T \geq 40$, the option expires worthless and the investor loses the premium (\$3).