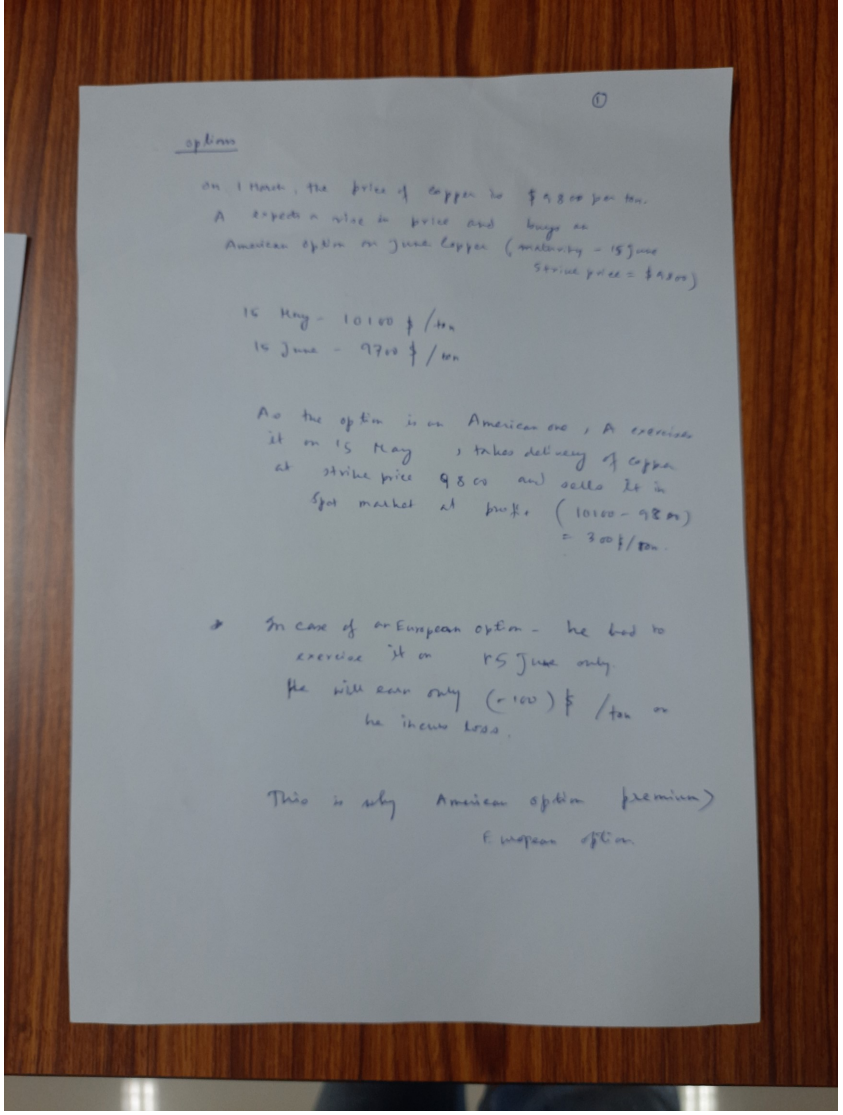

①

options

on 1 March, the price of copper is $9800 per ton.
A expects a rise in price and buys an
American option on June copper (maturity - 15 June
strike price = $9800)

15 May - 10100 $/ton
15 June - 9700 $/ton

As the option is an American one, A exercises
it on 15 May, takes delivery of copper
at strike price 9800 and sells it in
spot market at profit. (10100 - 9800)
= 300 $/ton.

* In case of an European option - he had to
exercise it on 15 June only.
He will earn only (-100) $/ton as
he incurs loss.

This is why American option premium >
European option

Relation b/w Strike price and market price

* An option is said to be "at the money" (ATM) if current market price = Strike price

* An option is said to be "in-the-money" (ITM) when Strike price relates to the market price in such a way it is advantageous to execute the deal / exercise the option.

ITM { For a call option — Strike price < current price
" " put " — Strike price > current price

* out of the money (OTM) is just reverse to ITM.

OTM { call option → Strike price > current price
put option → Strike price < current price

Concept of "intrinsic value"

premium for an option = intrinsic value + time value.

An option is said to have any intrinsic value when it is 'ITM'.

Intrinsic value is zero for ATM or OTM.

time value depends on time to maturity

higher the remaining time to maturity, higher is uncertainty about it, and higher is the time value.

So intrinsic value = premium − time value.

also intrinsic value = Strike price − mkt price

for an in-the-money option.

An example,
A company's share is trading at 110 spot and 104 Call has 5 intrinsic value
premium > intrinsic val

∴ Intrinsic value of any call option

= mkt price − discounted present value of the exercise price

Intrinsic value of American put

= exercise price − mkt price

Intrinsic value of European put option

= discounted value of Strike price − mkt price

Factors that affect option prices

① Intrinsic value

② Time value

③ Volatility.

frequency and magnitude of change in price

Measure - (S.D. =) or variance)

coefficient of variation → $\frac{SD}{Mean} \times 100$

* Delta δ = $\frac{\%\text{ change in option price}}{\%\text{ change in price of underlying asset}}$

* Gamma (γ) = $\frac{\text{change in } \delta}{\text{change in underlying price}}$

* Rho (ρ) = $\frac{\text{Expected change in price of option}}{\%\text{ change in risk free interest rate.}}$

* Vega (~~κ~~ kappa) = $\frac{\text{change in price of option}}{\text{change in volatility}}$