Q4

Nifty June - long c9500 and short C10000 (call spread).	Nifty June - long c9200 and long p9200 (straddle).
Since, both are calls, delta for each is positive. C9500 in slightly OTM will have delta in the 0.3 to 0.5 range. While C10,000 is deeply OTM, will have delta near 0-0.1. Net = 0.3-0.5*1 + 0-0.1*(-1) ['-' because of shorting].	Delta for call is +ve, put is -ve. Both are almost ATM, so 0.5 + (-.5) = 0. Delta zero product. ['-' because of shorting].
Gamma is always positive. C9500 being slightly OTM it will have a larger gamma than C10000. Therefore net gamma will be positive but less than C9500 due to subtraction by shorting.	Gamma is always positive for call/put. Since both positions are long, gamma is positive.
Theta is the seller's friend. However, ATM options have more time value in it. Deep OTM options will have lower theta than slightly OTM. so gain from sell < loss from buying. Therefore, overall negative theta	C9200, P9200 both lose money as we are long and theta is the seller's friend. Both options are ATM and will lose money. Negative theta overall
Always positive individually. Vega for C9500>Vega for C10,000. Therefore +ve of long 9500 > negative of short 10,000	Always positive individually. Since both are long positive.

Q5

Open interest is the total number of outstanding derivative contracts, such as options or futures that have not been settled for an asset. It provides a more accurate picture of the options trading activity, and whether money flows into the futures and options market are increasing or decreasing.

I would expect the most OI numbers to lie near ATM options (both puts/calls). Since the speculation is always there, these would be concentrated in around 1 average standard deviation of the price. Slight OTM-ATM-Slightly ITM.

Q6

Actual - 538

Calculation -

spot <- 9203.55

strike <- 10000

intrst <- 3.58/100 (91 day t bill rbi)

time <- 238/365

vol <- 0.25

Gives price 512!

Q7

Higher Volatility would mean that there is a larger chance for the option to expire ITM. infinite volatility essentially would essentially push the premium upto the spot stock(underlying) price but not beyond, because the option “derives” its

value from the underlying, and it wouldn’t make sense for an option to cost more than the stock itself.

This way if it was, you could sell the call and buy stock and make a profit >= to the IV with no risk leading to arbitrage.

Similar bound for put options will be in place, and the premium would approach the strike price.