Practice Problems on Derivatives and Mutual Fund:

1. Alice made a future contract with Jack to purchase X company's share at $100 per share after three months. There is no contact premium/price for this future contact. Three months later the price of X company's share raisen to $105 per share. The number of future contract they entered into was 1000. How much is the payoff of Alice from this contact?

Answer: (-100 + 105)*1000 = 5000

2. Jon is a foreign exchange dealer and he sells American Dollar. Faria is going to the U.S. after two months. Because U.S. dollar is quite volatile, Faria decided to enter into a forward contact to buy 1000 U.S. dollar for 125Tk per dollar after two months. Meantime, the price of US dollar fell down to 123Tk per dollar. Calculate the total payoff of Jon.

Answer: (-123+125)*1000 = 2000

3. In problem 2., if the price of US dollar went up to 127Tk per dollar, what would have been the payoff of Jon?

Answer: (-127+125)*1000 = -2000

4. Jia has decided to buy some call options. He made a contact with Ayesha to purchase Square Pharma stock at 1000tk per share within next three months. He paid 30Tk per share for this contact. Sometime before next three months, the price of Square Pharma became 1050Tk per share.

a) How much will be the net profit of Jia?

Answer: (1050-1000)-30 = 20

b) If the stock price become 1020Tk per share what would be the net profit of Jia per share?

Answer: (1020-1000)-30 = -10, Jia will execute it as -10 is better than the profit/payoff from non-execution i.e., -30 (the option premium)

c) If the stock price become 1030Tk per share what would be the net profit of Jia per share?

Answer: (1030-1000)-30 = 0. Jia will execute it as 0 is better than the profit/payoff from non-execution i.e., -30 (the option premium)

5. Jia has decided to buy some call options. He made a contact with Ayesha to purchase Square Pharma stock at 1000tk per share within next three months. He paid 30Tk per share for this contact. Sometimes before next three months, the price of Square Pharma became 1050Tk per share.

a) How much will be the net profit of Ayesha?

Answer: (1000-1050) +30 = -20

b) If the stock price became 1020Tk per share what would be the net profit of Ayesha per share?

Answer: (1000 – 1020) +30 = 10

c) If the stock price became 1030Tk per share what would be the net profit of Ayesha per share?

Answer: (1000 – 1030)+30 = 0

6. Kailee has bought 1000 put options for 4Tk each. The dealing is that she will sell rice at 50Tk per kg to Philip in next three months. Meantime, by three months the price of rice fell to 45Tk per kg in the market.

a) How much will be the net profit of Kailee?

Answer: (-4 +50 -45)*1000 = 1000

b) If rice price became 46 per kg what would be the net profit of Kailee per kg?

Answer: (-4 +50 -46)*1000 = 0

c) If rice price became 40 per kg what would be the net profit of Kailee per kg?

Answer: (-4 + 50 -40)*1000 = 6000

d) If rice price became 50 per kg what would be the net profit of Kailee per kg?

Answer: (-4 +50 -50)*1000 = -4000

e) If rice price became 55 per kg what would be the net profit of Kailee per kg?

Answer: (-4 +50 -55)*1000 = -9000. Kailee will not execute the contract as by executing she will loose 9000 and by not executing she will loose 4000.

7. Kailee has bought 1000 put options for 4Tk each. The dealing is that she will sell rice at 50Tk per kg to Philip in next three months. Meantime, by three months the price of rice fell to 45Tk per kg in the market.

a) How much will be the total net profit of Philip?

Answer: (4 -50 +45)*1000 = -1000

b) If rice price became 46 per kg what would be the net profit of Philip per kg?

Answer: (4 -50 +46)*1000 = 0

c) If rice price became 40 per kg what would be the net profit of Philip per kg?

Answer: (4 - 50 +40)*1000 = -6000

8. BRAC EPL First Mutual Fund has issued 2,500,000 shares for their mutual fund and The composition of their portfolio is as follows:

Share	No. Shares	Market Value Per Share (BDT)

Stock X	200,000	25
Stock Y	300,000	50
Stock Z	400,000	30

i. The fund has a liability of BDT 180,000 to the portfolio manager. What is the net asset value of the fund and per unit?

ii. Assume after 3-years, total market value of all stocks increased by 3% The fund has accrued BDT 200,000 as management fee with the portfolio manager. What is the net asset value of the fund per unit and Investors' rate of returns? How much will the annualized return be?

Answer: Calculate it yourself