

# UNIVERSITY OF COLOMBO, SRI LANKA

## FACULTY OF MANAGEMENT AND FINANCE

Bachelor of Business Administration (Level II-Semester VII) Examination – June 2017

### FIN 2204 – Derivatives & Alternative Investments

Two (02) Hours

**Instructions to candidates:**

- Answer all questions.
  - Use of calculator is permitted.
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**01.**

- i. Define the derivative instrument and explain how it is differently used for hedging and speculation purposes using relevant examples. **(06 marks)**
- ii. Differentiate Forward Contracts from Futures Contracts based on their characteristics. **(06 marks)**
- iii. Classify derivatives under 03 different criteria using 2 relevant examples for each. **(06 marks)**
- iv. Find the payoffs to long and short put positions at the prices of Rs. 90, Rs.100, and Rs.110, where the strike price of the put option is Rs.100. Also comment on its exercisability under each market price. **(04 marks)**
- v. State three main assumptions for Black-Scholes-Merton model. **(03 marks)**

**(Total 25 Marks)**

02.

Mr. Ravi, a UK citizen is in the business of import and export. He is required to make a payment of \$ 1.65 million in three months' time (30<sup>th</sup> November). He is of the opinion that the exchange rate movement cannot be predicted and hence he looks in to the past daily volatility in the exchange rate, which has been quantified as 0.07%. Further his policy is to hedge any maximum loss above \$ 25,000.

Spot rate: £ 1/ \$ 1.2850 – 1.2930

- i. Calculate the maximum loss during a 3 months period with 99% confidence to the nearest £?

Hence is looking forward for a better way to mitigate this risk. Following information is provided by his bank.

Forward premium: 1.5 – 1.6 c pm

**(05 marks)**

- ii. What is the effective payment in £'s if Mr. Ravi uses the Forward contract?

Now he wants to know the possibility of using futures contract to cover up this transaction.

The bank has published these quotations;

Contract size is £ 200,000

December future prices are given in \$ / 1£.

Futures price today = 1.3365

Spot price forecast (November 30<sup>th</sup>) = 1.3280

**(05 marks)**

- iii. What is the effective payment under futures contract and calculate the effective rate?

He now decides to evaluate an Option contract also due to its optionality regarding the transaction. The bank quotes as;

Current stock price = \$42

Strike price of stock is \$40

Risk-free rate = 6%.

**(05 marks)**

iv. a. What is the price of the option?

Options contract size is for £ 125,000 and strike price and premiums are quoted in \$ / 1£. Strike price of the option = \$ 1.17 / 1£. Using these information,

b. Compute the option premium if he undertakes the Option?

c. Find out how much would be the net effective cost of payment?

(10 marks)

(Total 25 marks)

03.

i. Diversification (portfolio approach) can reduce the level of risk that an investment carries over its maturity period. As per Model building approach, the following information is provided to you.

Portfolio 1- Position in Microsoft shares: \$10 million

N= 10 days

X = 99%

Volatility in expected return of stock = 2%.

Portfolio 2- Position in Apple shares: \$5 million

N= 10 days

X = 99%

Volatility in expected return of stock = 1%.

a. Find out the VaR under single asset case.

Consider a portfolio consisting of both \$ 10 mn of Microsoft shares (X) and \$5 mn of Apple shares (Y). Following information is provided;

Correlation between two shares = 0.3

- a. Find out VaR under Two-asset case, given that the  $\sigma_x = 200,000$  and  $\sigma_y = 50,000$
- b. Prove the benefit of diversification.

**(10 marks)**

ii. An Indian company needs dollar funds for 6 months. It obtains the following rates;

3 month interest rates                      INR 9.8%; \$ 6.4%

6 month interest rates                      INR 9.9%; \$ 6.12

Determine what should be the three month interest rates after three months to make the company indifferent between 3 month borrowing and 6 month borrowing under these two alternatives.

a. INR borrowing

b. Dollar borrowing

**(06 marks)**

iii. State two advantages and disadvantages of an Options contract.

**(04 marks)**

**(Total 20 marks)**

**04.** Elaborate the following concepts with relevant examples.

i. Ticks

ii. Option contracts as financial insurance

iii. Real Options

iv. Netting

v. Collateralization

vi. Default correlation

**(Total 30 marks)**

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