

May Examination Period 2024

ECN358 Futures and Options Duration: 2 hours

**YOU ARE NOT PERMITTED TO READ THE CONTENTS OF THIS QUESTION PAPER UNTIL
INSTRUCTED TO DO SO BY AN INVIGILATOR**

Answer ALL SEVEN questions

Cross out any answers that you do not wish to be marked

You are permitted to bring 20 x A4 pages of notes into your examination (i.e. 10 double sided pieces of paper). These can be typed or handwritten and can include graphs and images. They can include material from any source.

Your notes must be stapled together and include your student ID number and the module code on the first page. You must submit your notes at the end of the examination with your answer booklet.

Non-programmable calculators are permitted in this examination. Please state on your answer book the name and type of machine used. Complete all rough workings in the answer book and cross through any work that is not to be assessed.

Possession of unauthorised material at any time when under examination conditions is an assessment offence and can lead to expulsion from QMUL. Check now to ensure you do not have more than 20 pages of notes. You should also not have mobile phones, smartwatches or unauthorised electronic devices on your person. If you do, raise your hand and give them to an invigilator immediately.

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EXAM PAPERS MUST NOT BE REMOVED FROM THE EXAM ROOM

Examiners: Sarah Mouabbi

Question 1

An investor sells a European call on a share for \$4. The stock price is \$47 and the strike price is \$50. Under what circumstances will the option be exercised? Draw a diagram showing the variation of the investor's profit with the stock price at the maturity of the option.

[10 marks]**Question 2**

A Forward Rate Agreement (FRA) entered into some time ago ensures that a company will receive 4% (p.a., annually compounded) on \$100 million for three months starting in 1 year. The forward LIBOR for the period is 5% (p.a., annually compounded) and the 1.25 year rate is 4.5% (p.a., continuous compounding). What is the value of the FRA?

[10 marks]**Question 3**

A company declares a 2-for-1 stock split. Explain how the terms change for a call option with a strike price of \$60.

[10 marks]**Question 4**

Explain two ways in which a bear spread can be created.

[15 marks]**Question 5**

Companies A and B have been offered the following rates per annum on a 1-year investment of \$10 million.

	Fixed Rate	Floating Rate
Company A	8.0%	LIBOR
Company B	8.8%	LIBOR

Company A requires a fixed-rate investment and company B requires a floating-rate investment. Design a swap that will net a bank, acting as an intermediary, 0.2% per annum and will appear equally attractive to A and B. Provide a scheme.

[15 marks]

Question 6

The current price of a stock is \$50. The term structure of interest rates (continuously compounded) is at 10%. What is the six-month forward price of the stock? Denote this as F . The six-month call price at strike F is equal to \$8. The six-month put price at strike F is equal to \$7. Do you think there is an arbitrage opportunity? If so how would you exploit it?

[20 marks]**Question 7**

A stock price is currently \$40. Over each of the next two three-month periods it is expected to go up by 10% or down by 10%. The risk-free interest rate is 12% per annum with continuous compounding.

- a) What is the value of a six-month European put option with a strike price of \$42?

[10 marks]

- b) What is the value of a six-month American put option with a strike price of \$42?

[10 marks]

End of Paper