FINANCIAL RISK MANAGEMENT 26.2.2014

Jukka Perttunen

Name: _____

Student number: _____

All the answers on these sheets only!

1. A fixed-coupon bond is paying 50 euros annual coupons. The next coupon is paid one year from now, and the time-to-maturity of the bond is five years. The face value of the bond is 1000 euros, and the current market price of the bond is 916.58 euros.

a) Show that the yield-to-maturity of the bond is 6.8%.

b) Calculate the duration of the bond.

3. Assume that the asset price follows a log-normal distribution. The current asset price is 20 euros, and the volatility of the asset is 35%. The risk-free interest rate is 5%.

a) Determine the value of a forward contract on the asset, with a delivery price of 21 euros, and the remaining time-to-maturity of six months.

b) Determine the value of a European call option on the asset, with a strike price of 21 euros, and the remaining time-to-maturity of six months.

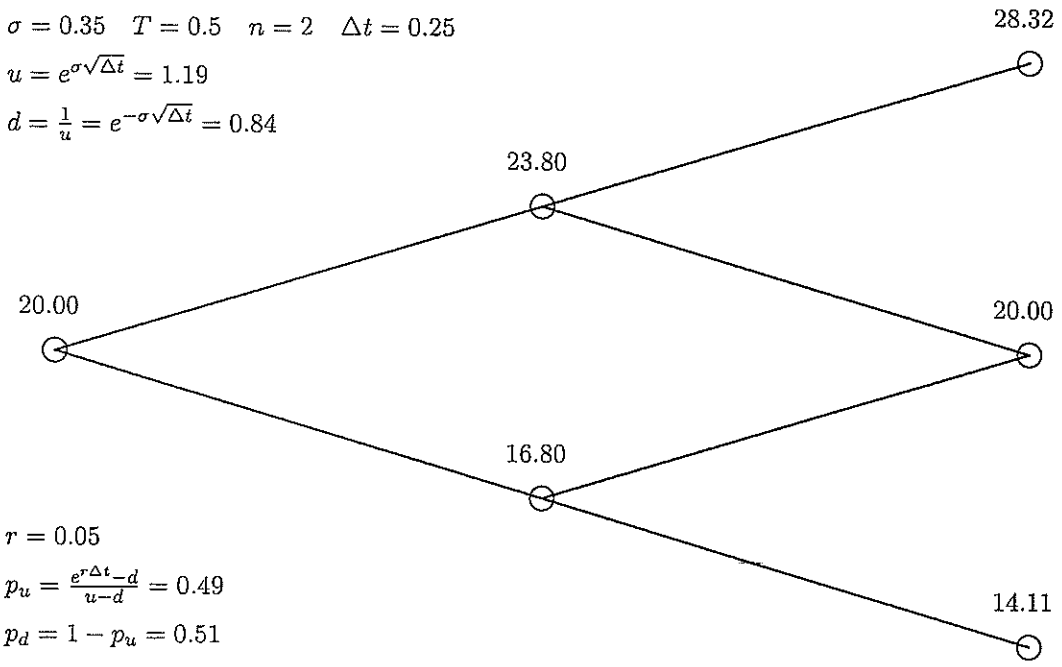
c) Determine the value of a European put option on the asset, with a strike price of 21 euros, and the remaining time-to-maturity of six months.

5. The following binomial tree represents the price process of a non-dividend-paying stock. Determine the approximate price of a six-month American put option on the stock. The strike price is $K = 21$.

$\sigma = 0.35 \quad T = 0.5 \quad n = 2 \quad \Delta t = 0.25$

$u = e^{\sigma\sqrt{\Delta t}} = 1.19$

$d = \frac{1}{u} = e^{-\sigma\sqrt{\Delta t}} = 0.84$



$r = 0.05$

$p_u = \frac{e^{r\Delta t} - d}{u - d} = 0.49$

$p_d = 1 - p_u = 0.51$