WSB

UG Examination - SAMPLE

International Finance

Time allowed: 90 min

Answer ALL Questions in Section 1 and 2 questions from Section 2. Section 1 is worth 60% of the final mark. Marks assigned to specific sub sections are displayed in brackets. Each question in Section 2 is worth 20% of the final mark.

Notes are not permitted in this examination.

Section 1

Question 1

Consider a long forward contract to purchase a stock in 3 months that pays £1 in 1 month time. Assume that the current stock price is £40 and the 3-month risk-free interest rate is 5% per annum. Suppose that the forward price is relatively high at £42. What is the arbitrage profit?

[20]

Question 2

Is it possible to make a risk free arbitrage profit on any of these markets? And if yes how to obtain it?

[15]

	Currencies	Spot-quotes (bid-ask)	A interest rate	Foreign interest rate	Forward-quotes
1	A/EUR	7.43-7.45	3.54-3.56	3.17-3.19	7.455-7.478
2	A/USD	8.32-8.34	3.54-3.56	1.79-1.81	8.465-8.480
3	A/GBP	11.99-12.01	3.54-3.56	4.03-4.05	11.923-11.967

Question 3

During the year Toyota shares went form 9000 yen to 11200yen, while paying a dividend of 60 yen. At the same time the exchange rate went from $1= 145 yen, to $1 = 120 yen.

What was the total dollar return in percent on Toyota stock for the year? [10]

Question 4

Suppose that one of the incentives provided by Taiwan to woo Xidex into setting up a local production facilities is a 10-year, $12.5 mil loan at 8% rate. The principal is to be repaid at the end of 10th year. The market interest rate on such a loan is about 15%.

With a marginal tax rate of 40%, how much is this loan worth to Xidex? [15]

Section 2

Question 5

Fixed vs. floating exchange rates. Discuss the benefits. [20]

Question 6

What determines exchange rates? Discuss. [20]

Question 7

Will cost of capital be lower in international world? Discuss [20]

International Finance - Formulae

Bonds

Price of a coupon-paying bond:

$$p = \frac{c}{1+y} + \frac{c}{(1+y)^2} + \frac{c}{(1+y)^3} + \ldots + \frac{c+m}{(1+y)^\tau}$$

Macaulay Duration:

$$D = -\left(\frac{1+y}{p}\right)\frac{\partial p}{\partial y} = \frac{1}{p}\left[\frac{1\times c}{(1+y)} + \frac{2\times c}{(1+y)^2} + \frac{3\times c}{(1+y)^3} + \ldots + \frac{\tau\times(c+m)}{(1+y)^\tau}\right]$$

Options

The Black-Scholes formula for the value, *c*, at time *t*, of a European call option on a non-dividend-paying stock is:

$$c = S_t\Phi(d_1) - \exp(-r\tau)K\Phi(d_2)$$

$$p = \exp(-r\tau)\,K\Phi(-d_2) - S_t\Phi(-d_1)$$

where:

$$d_1 = \frac{\ln\left(\frac{S_t}{K}\right) + \left(r + \frac{\sigma^2}{2}\right)\tau}{\sigma\sqrt{\tau}}$$

$$d_2 = \frac{\ln\left(\frac{S_t}{K}\right) + \left(r - \frac{\sigma^2}{2}\right)\tau}{\sigma\sqrt{\tau}} = d_1 - \sigma\sqrt{\tau}$$

and: S_t is the price of the underlying stock at time *t*,

$\tau\ (=T-t)$ is the time to expiry,

r is the continuously compounded risk-free rate of interest,

σ is the price volatility of the underlying stock,

K is the strike price,

Φ(.) is the cumulative distribution function for a standard normal random variable.

Table 1: The standard normal distribution function

	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0	0.5	0.504	0.508	0.512	0.516	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.591	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.648	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.67	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.695	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.719	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.758	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.791	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.834	0.8365	0.8389
1	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.877	0.879	0.881	0.883
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.898	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.937	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.975	0.9756	0.9761	0.9767
2	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.983	0.9834	0.9838	0.9842	0.9846	0.985	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.989
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.992	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.994	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.996	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.997	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.998	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.999	0.999
3.1	0.999	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.7	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.8	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999

Procedure for finding $\Phi(z) = P(Z < z)$:

Look down the first column for the first decimal place of *z*, look along the top row for the second decimal place of *z*, and read $\Phi(z)$ from the middle of the table.