Name* : *SOLUTION ***Student ID* :**

Question 1

You're given the following information about an invesment account:

	1/1/91	5/1/91	9/1/91	1/1/92
Account Balance Before deposit or withdrawal	50,000	75,000	90,000	67,000
Deposit		15,000		
Withdrawal			25,000	

Calculate the absolute value of the difference in the yield rates by the dollar weighted and time weighted methods.

$$67,000 = 50,000 + 15,000 - 25,000 + I$$

$$I = 27,000$$

$$i_{DW} = \frac{27,000}{50,000 \cdot (1) + 15,000 \cdot \left(\frac{8}{12}\right) - 25,000 \cdot \left(\frac{4}{12}\right)} = 0.52258$$

$$1 + i_{TW} = \frac{75,000}{50,000} \cdot \frac{90,000}{75,000 + 15,000} \cdot \frac{67,000}{90,000 - 25,000}$$

$$1 + i_{TW} = 1.54615$$

$$i_{TW} = 0.54615$$

$$|i_{TW} - i_{DW}| = |0.54615 - 0.52258| = 0.02357$$

Question 2

You're given the follwing information about bonds and each one of them has par value of 100 :

Term	*Coupon*	*Price*
1 *year*	0%	96.62
2 *year*	0%	x
3 *year*	0%	88.9

It is know that the one year forward rate starting in two years is 4.5%. *Calculate* x.

All bonds are zero coupons so their price equation is : $P = C \cdot v^n$

And we're given : $f_{2,3} = 0.045$

$$96.62 = \frac{100}{(1 + s_1)}$$

$$x = \frac{100}{(1 + s_2)^2}$$

$$88.90 = \frac{100}{(1 + s_3)^3} \rightarrow (1 + s_3)^3 = 1.124859393$$

$$(1 + s_3)^3 = (1 + s_2)^2 \cdot \left(1 + f_{2,3}\right) = (1 + s_2)^2 \cdot (1.045) = 1.124859393$$

$$s_2 = 0.037506811$$

$$x = \frac{100}{(1 + s_2)^2} = \frac{100}{(1.037506811)^2} = 92.90050763$$