

## HW 4.1 (a) Key

1. A 15-year 1400 par bond yields 4% convertible semiannually. Coupons are paid semiannually at 4% per annum. The bond is redeemable at par. Find the purchase price of the bond.

(A) 1400 B) 1120 C) 1190 D) 1260 E) 1330

$$F = C = 1400 \quad r = 2\% \quad i = 2\% \quad n = 30$$

$$P = 28a_{\overline{30}|2\%} + 1400v^{30} = \boxed{1400}$$

2. A 900 par value bond pays coupons semiannually at 6.5% per annum. The bond has a redemption value of 1150 after 15 years. The yield on the bond is 8% per annum compounded semiannually. Find the purchase price of the bond.

(A) 860.36 B) 722.7 C) 757.12 D) 791.53 E) 825.94

$$F = 900 \quad C = 1150 \quad r = 3.25\% \quad i = 4\% \quad n = 30$$

$$P = 29.25a_{\overline{30}|4\%} + 1150v^{30} = \boxed{860.36}$$

3. A 700 par value bond pays coupons semiannually at 8% per annum and is redeemable after 25 years. At a price of 791.05, the yield on the bond is 7%, compounded semiannually. Find the redemption value of the bond.

(A) 750 B) 675 C) 700 D) 725 E) 775

$$F = 700 \quad C = ? \quad r = 4\% \quad i = 3.5\% \quad n = 50 \quad P = 791.05$$

$$791.05 = 28a_{\overline{50}|3.5\%} + Cv^{50} \rightarrow \boxed{C = 750}$$

4. A 1100 par value bond pays coupons semiannually at 5% per annum and is redeemable at par after 15 years. The price of the bond is 951.95. Find the nominal semiannual yield rate of the bond.

(A) 6.41% B) 6.09% C) 6.25% D) 6.57% E) 6.73%

$$F = C = 1100 \quad r = 2.5\% \quad i = ? \quad n = 30 \quad P = 951.95$$

$$951.95 = 27.5a_{\overline{30}|i} + 1100v^{30} \xrightarrow{\text{BAII}} \begin{array}{l} N = 30 \\ PV = 951.95 \end{array} \quad \begin{array}{l} PMT = -27.5 \\ FV = -1100 \end{array} \rightarrow i = 3.205\%$$

5. A 800 par value bond pays coupons semiannually at 8.5% per annum. The bond has a redemption value of 900 after 30 years. The yield on the bond is 7% per annum compounded semiannually. Find the special coupon rate,  $g$ . Keep in mind that  $g$  will be a semiannual rate.

(A) 3.78% B) 3.85% C) 3.93% D) 4% E) 4.08%

$$F = 800 \quad r = 0.0425 \quad C = 900$$

$$Fr = Cg \rightarrow 34 = 900g \rightarrow \boxed{g = 3.78\%}$$