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Batch: RWP OB 46

Assignment # 1

1- You want to buy an ordinary annuity that will pay you \$4,000 a year for the next 20 years. You expect annual interest rates will be 8% over that time period. The maximum price you would be willing to pay for the annuity is closest to:

$$P = \$4000$$

$$i = 8\%$$

$$n = 20 \text{ years}$$

$$PV = ?$$

$$PV = P \left[\frac{1 - (1+i)^{-n}}{i} \right]$$

$$= 4000 \left[\frac{1 - (1 + 8\%)^{-20}}{8\%} \right]$$

$$= 4000 \left[\frac{1 - (1 + 0.08)^{-20}}{0.08} \right]$$

$$= 4000 \left[\frac{1 - (1.08)^{-20}}{0.08} \right]$$

$$= 4000 \left[\frac{1 + 0.2145}{0.08} \right]$$

$$= 4000 \left[\frac{1.2145}{0.08} \right] = 4000 \left[\frac{0.7855}{0.08} \right]$$

$$= 4000 (9.81875)$$

$$\boxed{= 39275} \text{ Ans} = 39275 \$$$

2- You wish to borrow \$80,000 to be repaid in 24 monthly installments at an annual interest of 8%. What is your monthly payment?

(a) \$262.82 (b) \$361.82

(c) \$150.50 (d) \$325.00

(e) None of these

$$PV = 8000$$

$$n = 24$$

$$i = 8\%$$

$$FV = ?$$

$$FV = PV(1+i)^n$$

$$= 8000(1+0.08)^{24}$$

$$= 8000(1.08)^{24}$$

$$= 8000(6.34)$$

$$\boxed{FV = 50729.45}$$

(V) You are considering ^{investing} in a preferred Stock that has a dividend of \$3.25 per share. The market price of this stock is \$48.625. What is the rate of return you would expect to make on this perpetuity?

- (a) 6.68% (b) 6.24% (c) 6.05%
(d) 6.28% (e) None of these

Solution:

$$D = \$3.25$$

$$PV = \$48.625$$

$$i = ?$$

$$PV = \frac{D}{i} \Rightarrow i = \frac{D}{PV}$$

$$i = \frac{3.25}{48.625} = 0.0668$$

$$i = 6.68\%$$

(iv) What is the Future value of a \$500 investment, with stated interest rate of 6% compounded monthly for 7 years?

- (a) \$700 (b) \$730 (c) \$760
(d) \$790 (e) None of these

$$PV = \$500$$

$$i = 6\%$$

$$m = 12$$

$$n = 7 \text{ years}$$

$$FV = ?$$

$$FV = PV \left(1 + \frac{i}{m} \right)^{n \times m}$$

$$= 500 \left(1 + \frac{6\%}{12} \right)^{7 \times 12}$$

$$= 500 \left(1 + \frac{0.06}{12} \right)^{84}$$

$$= 500 \left(\frac{12 + 0.06}{12} \right)^{84}$$

$$= 500 \left(\frac{12.06}{12} \right)^{84}$$

$$= 500 (1.005)^{84}$$

$$= 500 (1.520)$$

$$\boxed{FV = \$760}$$

n) If you invest \$600 every six months at 8% compounded semi annually, how much would you accumulate at the end of 10 years?

$$i = 8\%$$

$$m = 2$$

$$n = 10 \text{ years}$$

$$P = \$600$$

$$FV = ?$$

$$FV = P \left[\frac{\left(1 + \frac{i}{m}\right)^{n \times m} - 1}{i/m} \right]$$

$$= 600 \left[\frac{\left(1 + \frac{0.08}{2}\right)^{10 \times 2} - 1}{0.08/2} \right]$$

$$= 600 \left[\frac{\left(\frac{2 + 0.08}{2}\right)^{20} - 1}{0.04} \right]$$

$$= 600 \left[\frac{\left(\frac{2.08}{2}\right)^{20} - 1}{0.04} \right]$$

$$= 600 \left[\frac{\left(\frac{1.04}{1}\right)^{20} - 1}{0.04} \right]$$

$$= 600 \left[\frac{(1.04)^{20} - 1}{0.04} \right]$$

$$= 600 \left[\frac{2.191 - 1}{0.04} \right]$$

$$= 600 \left[\frac{1.191}{0.04} \right]$$

$$= 600 [29.7786]$$

$$FV = \$17866.85$$

iii- A commercial bank will loan you \$12,250 for 3 years to buy a car. The loan must be repaid in 36 equal monthly payments. The annual interest rate on the loan is 12% of the unpaid balance. How large are the monthly payments?

- (a) \$425.00 (b) \$350.67
 (c) \$375.09 (d) \$406.88
 (e) None of these

$$PV = 12250$$

$$n = 36$$

$$i = 12\% = 0.12$$

$$P = ?$$

$$PV = P \left[\frac{1 - (1+i)^{-n}}{i} \right]$$

$$12250 = P \left[\frac{1 - (1+0.12)^{-36}}{0.12} \right]$$

$$12250 = P \left[\frac{1 - (1.12)^{-36}}{0.12} \right]$$

$$12250 = P \left[\frac{1 - 0.0169}{0.12} \right]$$

$$12250 = P \left[\frac{0.983}{0.12} \right]$$

$$12250 = P [8.192]$$

$$\frac{12250}{8.192} = P$$

$$P = 1495.28$$