EMBA 710

Case One

1. Cox Communications, Inc. is building a new facility in Las Vegas and is financing this construction project with a loan in the amount of $20,000,000. This loan has a 15 year maturity, calls for monthly payments, and is contracted at an interest rate of 5\%.

(A) What is the monthly payment?

\[ PV = 20,000,000 \quad \text{end mode} \]
\[ I = 5.25/12 \]
\[ N = 180 \]
\[ \text{CPT} \quad PMT = 160,775.54 \]

(B) How much will Shuffle Master, Incorporated owe on this loan after making monthly payments for 5 years?

\[ PMT = 160,775.54 \quad \text{end mode} \]
\[ I = 5.25/12 \]
\[ N = 120 \]
\[ \text{CPT} \quad FV = 14,984,900.14 \]

2. You begin saving for your retirement by depositing a series of $12,000 annual payments over the next 20 years in the form of an annuity due. These deposits are into a mutual fund that is expected to earn 10\% per year.

(A) How much will you have in your retirement account the day you retire?

\[ PMT = 12,000 \quad \text{begin mode} \]
\[ I = 10 \]
\[ N = 20 \]
\[ \text{CPT} \quad FV = 756,029.99 \]

(B) The day you retire (20 years from today) you move your funds into a safe money market account that pays 3.5\% per year. One year after you retire you start withdrawing money as an ordinary annuity. If you withdrawal an equal annual amount every year for 30 years (assumes you live for 30 more years after you retire) until all the money is gone, what is the amount of this yearly withdrawal?

\[ FV = 756,029.99 \quad \text{end mode} \]
\[ I = 3.5 \]
\[ N = 30 \]
\[ \text{CPT} \quad PMT = 41,106.83 \]
3. A recent advertisement in the financial section of a magazine carried the following claim: "Invest your money with us at 6.2 percent, compounded annually, and we guarantee to triple your money sooner than you imagine." Ignoring taxes, approximately how long would it take to triple your money at a nominal rate of 6.2 percent, compounded annually?

\[ P = -100 \]
\[ I = 6.2 \]
\[ F = 300 \]

\[ CPT \quad N = 18.26 \text{ yr} \]

4. You invest $300,000 with Northwestern Mutual in a 15 year annuity contract. This financial instrument is contracted to pay 15 years of monthly payments. These payments start today and the annual contracted interest rate on the instrument is 6% per year. What is the amount of the monthly payment?

\[ P = 300,000 \]
\[ I = 6/12 \]
\[ N = 15 \times 12 \]

\[ CPT \quad PMT = 2,518.92 \]

5. You have just purchased $7,000 worth of O.J. Simpson Memorabilia as an investment. What will this Memorabilia be worth in 40 years if it appreciates at an annual rate of 12% per year?

\[ P = 7,000 \]
\[ I = 12 \]
\[ N = 40 \]

\[ CPT \quad F = 651,356.29 \]
6. What is the value today of the following 4-year annuity at an interest rate of 10%?

<table>
<thead>
<tr>
<th>t_3</th>
<th>t_1</th>
<th>t_2</th>
<th>t_4</th>
<th>t_5</th>
<th>t_6</th>
<th>t_7</th>
<th>t_8</th>
<th>t_9</th>
<th>t_10</th>
</tr>
</thead>
<tbody>
<tr>
<td>10k</td>
<td>10k</td>
<td>10k</td>
<td>10k</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ P \times A = 10,000 \]  
\[ I = 10 \]  
\[ N = 4 \]  
\[ FV = 31,698.45 \]  
\[ N = 4 \]  
\[ I = 10 \]  
\[ CPT \]  
\[ FV_0 = 21,650.29 \]

7. Create an amortization table for 5-year, $1,000,000 loan, contracted at an 8% rate and calls for annual payments.

<table>
<thead>
<tr>
<th>Year</th>
<th>Beginning Balance</th>
<th>Payment</th>
<th>Principal</th>
<th>Interest</th>
<th>Ending Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1,000,000</td>
<td>250,456.18</td>
<td>170,456.18</td>
<td>80,000.00</td>
<td>829,543.82</td>
</tr>
<tr>
<td>2</td>
<td>829,543.82</td>
<td>250,456.18</td>
<td>184,042.93</td>
<td>66,413.25</td>
<td>645,500.57</td>
</tr>
<tr>
<td>3</td>
<td>645,500.57</td>
<td>250,456.18</td>
<td>191,820.41</td>
<td>58,635.77</td>
<td>446,630.12</td>
</tr>
<tr>
<td>4</td>
<td>446,630.12</td>
<td>250,456.18</td>
<td>214,726.25</td>
<td>35,733.93</td>
<td>231,904.12</td>
</tr>
<tr>
<td>5</td>
<td>231,904.12</td>
<td>250,456.18</td>
<td>231,904.12</td>
<td>15,552.06</td>
<td>0</td>
</tr>
</tbody>
</table>

\[ P \times A = 1,000,000 \]  
\[ N = 5 \]  
\[ I = 8 \]  
\[ CPT \]  
\[ P \times A = 250,456.18 \]

8. You deposited $25,000 in a savings account that pays 8 percent interest, compounded quarterly, planning to use it to finance your next educational venture, a PhD in Finance. Eighteen months later, you instead decide to go to Hollywood to become an actress(actor) rather than continue in school, so you close out this savings account. What is the value of the account at this time?

\[ P \times A = 25,000 \]  
\[ I = 8/4 \]  
\[ N = 6 \]  
\[ CPT \]  
\[ FV = 25,154.06 \]
9. You are deciding between two possible investment opportunities. Investment A is contracted to pay interest at an APR of 6.5% compounded monthly. Investment B is contracted to pay interest at an EAR of 6.65%. Investment B was compounded quarterly.

(A) Calculate the EAR of both Investment A and Investment B. Which would you choose based on EAR?

\[ \text{EAR}_A = 6.65\% \]
\[ \text{EAR}_B = 6.67\% \]
\[ I = 6.5/12 \]
\[ N = 12 \]
\[ FV = 100 \]
\[ \text{CPT} \]
\[ FV = 106.697 \]

(B) Calculate the APR of both Investment A and Investment B. Which would you choose based on APR?

\[ \text{APR}_A = 6.5\% \]
\[ \text{APR}_B = 6.49\% \]
\[ I = 6 \]
\[ N = 4 \]
\[ FV = 106.697 \]
\[ \text{CPT} \]
\[ I = 1.6226 \times 4 = 6.49\% \]

10. Payday loans are very short-term loans that charge very high interest rates. You can borrow $500 today and repay $525 in two weeks. What is the compound annual rate that is implied by this 5 percent rate charged for only two weeks? (Hint: Calculate the EAR)

\[ FV = 100 \]
\[ I = 5\% \]
\[ N = 26 \]
\[ \text{CPT} \]
\[ FV = 355.57 \]
\[ \text{EAR} = \frac{355.57 - 100}{100} = 255.57\% \]

11. For the 1979-80 season the average cost of a season ticket for UNLV basketball was $8. Thirty years later, for the 2009-10 season, the average cost is $200. What was the annual growth rate in season ticket cost over this 30-year period?

\[ PV = 8 \]
\[ N = 30 \]
\[ FV = 200 \]
\[ \text{CPT} \]
\[ I = 11.33\% \]
12. You purchase a new house and finance this purchase with a mortgage of $220,000. This mortgage loan has a 30 year maturity, calls for monthly payments, and is contracted at an interest rate of 4.75%

(A) What is the monthly payment?

\[ PV = 220,000 \]
\[ I = 4.75/12 \]
\[ N = 360 \]
\[ \text{CIR} \]
\[ PMT = 1,147.62 \]

(B) How much do you owe after making monthly payments for 5 years?

\[ PMT = 1,147.62 \]
\[ I = 4.75/12 \]
\[ N = 300 \]
\[ \text{CIR} \]
\[ PV = 201,296.12 \]

(C) How much of the sixty-first payment is interest? (This is your first payment in year 6)

\[ 201,296.12 \times (0.0475/12) = 796.80 \]

(D) How much of the sixty-first payment is principal? (This is your first payment in year 6)

\[ 1,147.62 - 796.80 = 350.82 \]