Problem 1

What is the present worth of the following cash flow series?

<table>
<thead>
<tr>
<th>End of Year</th>
<th>Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1,900</td>
</tr>
<tr>
<td>2</td>
<td>-$1,000</td>
</tr>
<tr>
<td>3</td>
<td>$700</td>
</tr>
</tbody>
</table>

The interest rate for the first two years will be 12% compounded monthly and then it will change to 10% compounded quarterly.

A. $1,380  
B. $1,400  
C. $1,425  
D. $1,600

Problem 2

Which of the following investment options would you choose at 10% interest, compounded annually?
A. Option A
B. Option A
C. Either (Both yield the same return)
D. Neither

Problem 3

General Mills Company (GMC) purchased a milling machine for $100,000 which it intends to use for the next 5 years. This machine is expected to save GMC $35,000 during the first operating year. Then, the annual savings are expected to decrease by 3% each subsequent year over the previous year due to increased maintenance costs. Assuming that GMC would operate the machine for an average of 3,000 hours per year and that it would have no appreciable salvage value at the end of the 5-year period, determine the equivalent dollar savings per operating hour at 14% interest compounded annually.

A. $0.568 / hr
B. $0.827 / hr
C. $0.941 / hr
D. $1.369 / hr

Problem 4

Find the value P, such that the terminal project balance of the following cash flow is 0 at 10% interest compounded annually.

<table>
<thead>
<tr>
<th>End of Year</th>
<th>Cash Flow</th>
<th>Project Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-P</td>
<td>-P</td>
</tr>
<tr>
<td>1</td>
<td>200</td>
<td>?</td>
</tr>
<tr>
<td>2</td>
<td>.5P</td>
<td>?</td>
</tr>
<tr>
<td>3</td>
<td>.25P</td>
<td>0</td>
</tr>
</tbody>
</table>

A. $475
B. $501
C. $455
D. $417
Problem 5

Find the value X such that the project's rate of return would be equal to 15%.

<table>
<thead>
<tr>
<th>End of Year</th>
<th>Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-$3,000</td>
</tr>
<tr>
<td>1</td>
<td>$1,330</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>$1,930</td>
</tr>
</tbody>
</table>

A. $840
B. $760
C. $620
D. $530

Problem 6

K.T. Labs bought a Gene gun for $25,000. The accounting department has estimated that the machine would have annualized capital cost of $3,880 over its 10-year service life. What salvage value was assumed in calculating the capital cost? The firm's interest rate is known to be 10%.

A. $3,201
B. $2,494
C. $2,750
D. $3,000

Problem 7

You are considering two investment options. In option A, you have to invest $5,000 now and $1,000 three years from now. In option B, you have to invest $3,500 now, $1,500 a year from now, and $1,000 three years from now. In both options, you will receive four annual payments of $2,000 each. (You will get the first payment a year from now.) Which of these options would you choose based on (i) the conventional payback criterion, and (ii) the present worth criterion, assuming 10% interest?

A. (i) Option A (ii) Option A
B. (i) Option B (ii) Option B
C. (i) Either (ii) Option A
D. (i) Either (ii) Option B
Problem 8

Find the capitalized equivalent worth of the following cash flow series at 10% interest.

A. $511
B. $445
C. $562
D. $482

Problem 9

Find the present worth $P$, of the following cash flow series at 10% interest.

A. $25.80
B. $28.75
C. $20.85
D. $24.10
Problem 10

Two 150 HP motors are being considered for installation at a water treatment plant. Both motors have a service life of 10 years at the end of which they have a negligible salvage value.

<table>
<thead>
<tr>
<th>Motor</th>
<th>Investment</th>
<th>Annual O &amp; M cost (excluding power)</th>
<th>Full load efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor A</td>
<td>$4,500</td>
<td>$675</td>
<td>83%</td>
</tr>
<tr>
<td>Motor B</td>
<td>$3,600</td>
<td>$540</td>
<td>80%</td>
</tr>
</tbody>
</table>

A. $900 < T <= $1,000  
B. $1,000 < T <= $1,100  
C. $1,100 < T <= $1,200  
D. $1,200 < T <= $1,300