Name_____ E-mail_____

EM 600 Engineering Economics and Cost Analysis, **Home Work #3**

School of Systems & Enterprises, Stevens Institute of Technology

"I PLEDGE MY HONOR THAT I HAVE ABIDED BY THE STEVENS HONOR SYSTEM"

By: _____

QUESTION 1:

Mr. Belly is planning to purchase a system for auto rent collection of his properties. The initial cost of $40,000 for this system is depreciated over 5-year period. It is expected to have a $8,000 salvage value at the end of 5 years. Using the straight-line method:

a. Calculate the annual depreciation allowances. **[2 points]**
b. Calculate the annual book values. **[2 points**]

QUESTION 2:

A circuit printing machine with a first cost of $150,000 is depreciated over 5-year period. It is expected to have a $15,000 salvage value at the end of 5 years. Using the double-declining balance method:

a. Calculate the annual depreciation allowances. (Please ignore the depreciation adjustment at this time) **[2 points]**
b. Calculate the annual book values. (Please ignore the depreciation adjustment at this time) **[2 points]**
c. What do you notice about the book value at the end of year 5? What does this mean? **[1 + 1 point]**

QUESTION 3:

Mr. White & Partners purchased a new pill packaging machine, which cost $45,000. The system was estimated to have a service life of 5 years with salvage value of $8,000. The property has been depreciated according to a 5 year MACRS property class. You are considering selling the asset for $10,000 after 5 years.

a. Calculate the annual depreciation allowances over 5 years. **[2 points]**
b. Calculate the annual book values over 5 years. **[2 points]**
c. Is there a capital gains or loss and if so, how much is the gain / loss? **[1 + 1 point]**

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QUESTION 4:

A manufacturing system for a new alopecia fighting drug requires an initial investment of $900,000and will generate $300,000 in revenue in year 1. The system will incur $90,000in general expenses, in the first year. The investment cost of all the equipment necessary to produce the drug is classified as a 5-year MACRS property for depreciation purposes. The expected salvage value of all the equipment is $50,000 at the end of the project life. The firm pays taxes at a rate of 30% and has a MARR of 12%. The manufacturing system has a 6-year life. Revenue will increase at 7% each year and expenses will increase at 5% each year. A loan is to be taken out for 10% of the initial investment amount. The loan will be repaid over the project life in equal payments, at an interest rate of 11%.

Calculate the following:

a. Determine the allowed depreciation amounts **[2 points]**
b. Calculate the repayment schedule of the loan **[2 points]**
c. Calculate the Gains (Losses) associated with Asset Disposal **[1 points]**
d. Create the Income Statement **[4 points]**
e. Develop a Cash Flow Statement **[4 points]**
f. Is this project justifiable at a MARR of 12%?
    - Calculate the NPV **[1 point]**
    - Calculate IRR **[1 point]**
    - State your conclusions. **[1 point]**