IE 342 STUDY SET 3
SUMMER 2019
Do not submit your solutions as they will not be graded!

1) U.S. Census Bureau statistics show that the annual earnings for persons with a high school diploma are $35,220 versus $57,925 for someone with a bachelor's degree. If the cost of attending college is assumed to be $30,000 per year for 4 years and the forgone earnings during those years are assumed to be $35,220 per year, what rate of return does earning a bachelor's degree represent? Use a 35-year study period. (Hint: The investment in years 1 through 4 is the cost of college plus the foregone earnings, and the income in years 5 through 35 is the difference in income between a high school diploma and a bachelor's degree.)
Answer: i = 6.85% per year

2) Consider four investments with the following sequences of cash flows:

	Net Cash flow			
n	Project A	Project B	Project C	Project D
0	-$18,000	-$30,000	$34,578	-$56,500
1	30,000	32,000	-18,000	2,500
2	20,000	32,000	-18,000	6,459
3	10,000	-22,000	-18,000	-78,345

a) Identify all the simple investments.
b) Identify all the nonsimple investments.
c) Compute i* for each project.
d) What can you say about the IRRs of the projects?

Answer: a) Project A

b) Project B and D

c) ProjectA: i=74.23%, ProjectB: i=111.11%, ProjectC: i=26.08%,

ProjectD: -213.43%

d) Project A: i*=IRR, Project B, C, D we cannot say anything. They might be mixed investment and hence we need an external rate.

3) Consider an investment project with the following cash flows:

n	Net Cash Flow
0	-$120,000
1	94,000
2	144,000
3	72,000

a) Find the IRR for this investment.
b) On the basis of the IRR criterion, should the project be accepted at MARR = 15%?
Answers: a) i=69.81% b) Accept the Project.

4) If a truck for hauling coal has an estimated net cost of $100,000 and is expected to give service for 250,000 miles, resulting in a salvage value of $5,000, depreciation would be charged at a rate of 38 cents per mile. Compute the allowed depreciation amount for the same truck's usage amounting to 55,000 miles.
Answer: D=$20,900

5) A piece of machinery purchased at a cost of $86,000 has an estimated salvage value of $12,000 and an estimated useful life of five years. It was placed in service on May 1 of the current fiscal year, which ends on December 31. The asset falls into a seven-year MACRS property category. Determine the depreciation amounts over the useful life.
Answer: D1=$12,289, D2= $21,061, D3= $15,041, D4= $10,741, D5=$7,680

6) Compute the DDB depreciation schedule for the following asset:

Cost of Asset, I	$46,000
Useful Life, N	5 years
Salvage Value, S	$10,000

(a) What is the value of α?
(b) What is the amount of depreciation for the second full year of use of the asset?
(c) What is the book value of the asset at the end of the fourth year?
Answer: a) $\alpha = 0.4$
b) D2= $11,040
c) B4= $10,000

7) On April 1, Leo Smith paid $250,000 for a residential rental property. This purchase price represents $200,000 for the building and $50,000 for the land. Five years later, on November 1, he sold the property for $300,000. Compute the MACRS depreciation for each of the six calendar years during which he had the property.