

IE 342 18-19 Spring Semester Study Set 5

Please note that we will not send the solution key! But you can ask your questions in the office hour.

- 1) Pelin makes 36 monthly deposits of \$200 starting from the end of year 1, in a savings account at a Bank which pays nominal interest of 24% per year compounded monthly. Two years after making the last deposit, the nominal interest rate changes to 16% compounded quarterly. If the accumulated money is withdrawn from the bank at the end of year 10, how much is withdrawn?
- 2) Consider the following investment projects:

<i>n</i>	Net Cash Flow		
	Project A	Project B	Project C
0	-\$100	-\$150	-\$100
1	30	50	410
2	50	50	-558
3	80	50	252
4		100	
IRR	(23.24%)	(21.11%)	(20%, 40%, 50%)

Assume that MARR=12% for the following questions:

- a) Identify the pure investment(s).
- b) Identify the mixed investment(s).
- c) Determine the IRR for each investment.
- d) Which project would be acceptable?

- 3) MARR is 10%.

<i>n</i>	P1	P2	P2-P1
0	-\$5,000.00	-\$10,000.00	
1	\$2,500.00	\$6,500.00	
2	\$3,750.00	\$5,500.00	
3	\$1,500.00	\$1,750.00	
IRR	27%	22%	

- a) Compute the i^* of P2-P1
- b) Which project would you choose using an IRR analysis?

4) If the MARR is 15% choose the best among the four alternatives

n	C1	C2	C3	C4
0	-\$4,500.00	-\$3,000.00	-\$2,000.00	-\$5000
1	\$2,500.00	\$2,500.00	\$750.00	\$10000
2	\$3,750.00	\$1,500.00	\$1,000.00	\$30000
3	\$1,500.00	\$1,750.00	\$1,250.00	-\$40000
IRR	35%	45%	21%	12%

5)

n	cash flow
0	-\$132,000
1	\$42,000
2	\$37,000
3	\$130,000

a) Find the IRR for this investment.

b) On the basis of the IRR criterion, should the project be accepted at MARR = 15%?

6) Cost of asset: \$32000

Useful life: 4 years

Salvage Value: \$10000

Depreciation Method: DDB

(a) What is the value of α ?

(b) What is the amount of depreciation for the second year of use of the asset?

(c) What is the book value of the asset at the end of the fourth year?

7) A consumer electronic company purchased a warehouse and converted it into a manufacturing plant for \$4,000,000. It completed installation of assembly equipment worth \$1,000,000 on December 31. The plant began operation on January 1. The company had a gross income of \$9,500,000 for the calendar year. Manufacturing costs and all operating expenses, excluding the capital expenditures, were \$2,480,000. The depreciation expenses for capital expenditures amounted to \$350,000.

- (a) Compute the taxable income of this company.
 (b) How much will the company pay in federal income taxes for the year?

8) In year 0, an automotive company purchased an industrial robot costing \$300,000. The robot is classified as seven year recovery property, and has been depreciated by the MACRS method. If the robot is sold after 5 years, compute the amount of gains(/losses) for the following three salvage values:

- (a) \$20,000
 (b) \$140,000
 (c) \$400,000
 (Assume both capital gains are taxed at 40% and ordinary gains are taxed at 34%)

9) Consider the following mutually exclusive investment projects.

n	Project A	Project B
0	-\$300	-\$800
1	\$0	\$1150
2	\$690	\$40

If the MARR is 15%, which project should be selected?

10) The double-declining-balance method is to be used for an asset with a cost of \$98,000, an estimated salvage value of \$26,000, and an estimated useful life of six years.

- a) What is the depreciation for the first three fiscal years, assuming that the asset was placed in service at the beginning of the year?
 b) If switching to the straight-line method is needed, when is the optimal time to switch?

11) Flint Metal Shop purchased a stamping machine for \$198,000 in the beginning of 2017.

The machine is expected to have a useful life of 12 years, a salvage value of \$22,000, a production of 200,000 units, and working hours of 20,000. During 2017, Flint used the stamping machine for 2,500 hours to produce 24,250 units.

From the information given, compute the book depreciation expense for 2017 under each of the following methods:

- (a) Straight line.
 (b) Units-of-production method.
 (c) Working hours.
 (d) Double-declining balance.

12) The owner of a plant is considering investing \$125,000 in new equipment. He estimates that the net cash flows will be \$12,000 during the first year, but will increase by \$5,500 per year the next year and each year thereafter. The equipment is estimated to have a 15-year service life and a net salvage value of \$50,000 at that time. The firm's interest rate is 11%.

- a) Determine the annual capital cost (ownership cost) for the equipment.
- b) Determine the equivalent annual savings (revenues).
- c) Determine whether this is a wise investment.