

**ISE 307, Term 153**  
**ENGINEERING ECONOMIC ANALYSIS**

**Quiz# 4**

Date: Wednesday, August 24, 2016

**Q1.** The double-declining-balance method is to be used for an asset with a cost of \$90,000, estimated salvage value of \$4,000 and estimated useful life of five years.

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

(a)

Without switching		
DDB		
$n$	$D_n$	$B_n$
0		\$90,000
1	\$36,000	\$54,000
2	\$21,600	\$32,400
3	\$12,960	\$19,440
4	\$7,776	\$11,664
5	\$7,664	\$4,000

(b) Allowed annual depreciation:

With switching			
From DDB to SL			
$n$	$D_n(DDB)$	$B_n$	$D_n(SL Method)$
0		\$90,000	
1	\$36,000	\$54,000	$(90000-4000)/5=17200$
2	\$21,600	\$32,400	$(54000-4000)/4=12500$
3	\$12,960	\$19,440	$(32000-4000)/3=9333$
4	\$7,776	\$11,664	$(19440-4000)/2=7720$
5	\$7,664	\$4,000	$(11664-4000)/1=7,664$

The switching occurs at the 5th year.

**Q2.** Nelson Company purchased equipment and incurred the following costs:

- Cash price = \$55,000
- Sales taxes = \$4,400
- Insurance during transit = \$400
- Site preparation, installation, and testing= \$2,300

- a) Determine the cost basis (the amount to be capitalized) for these cells.  
 b) Suppose that the equipment was sold after 3 years for \$30,000 and it was depreciated using the given below 5-year MACRS Table. Determine the book value and tax gains or losses assuming 35% tax rate.

20%	32%	19.20%	11.52%	11.52%	5.76%
1	2	3	4	5	6

a) The cost basis of the equipment

Cost of the equipment	\$59,400
Insurance	\$400
site preparation, installation, testing	\$2,300
cost basis	\$62,100

- b) Book Value =  $62,100 * [ 1 - (0.20 + 0.32 + 0.192/2) ] = \$23,846.4$   
 Tax gains (losses) =  $0.35*(30,000 - 23,846.4) = \$2,153.76$   
 Thus, there will be tax losses of \$2,153.76