**Gabriel Yeager**

**SYSE 5110**

**HW7**

**p 234: 2, 7, 9, 19**

**p 632: 6, 13, 16**

**2.** What amount will be accumulated by each of the following investments?

a. $8,000 at 7.2% compounded annually over 10 years.

F = P(1 + i)^n

= 8000 (1 + 0.072)^10

= **$16,033.85**

b. $52,500 at 8% compounded annually over 5 years.

F = P(1 + i)^n

= 52500 (1 + 0.08)^5

= **$77,139.72**

**7.** How many years will it take for $4,000 to grow to $7,000 at an interest rate of 10% compounded annually?

F = P(1 + i)^n

7000 = 4000(1 + 0.10)^n

**n ≈ 5.87152**

**5.87152 years, or 6 years if rounding**

**9.** An asset was purchased for $52,000 with the anticipation that it would serve for 12 years and be worth $6,000 as scrap. After 5 years of operation, the asset was sold for $18,000. The interest rate is 14%.

a. What was the anticipated annual equivalent cost of the asset?

AE = (52000 - 6000)/((1 – (1 / (1 + 0.14)^12))/ 0.14)

= **$8,126.79**

b. What was the actual annual equivalent cost of the asset?

AE = (52000 - 18000)/((1 – (1 / (1 + 0.14)^5))/ 0.14)

= **$9,903.64**

**19.** An equipment operator can buy a maintenance component from a supplier for $960 per unit delivered. Alternatively, operator can rebuild the component for a variable cost of $460 per unit. It is estimated that the additional fixed cost would be $80,000 per year if the component is rebuilt. Find the number of units per year for which the cost of the two alternatives will break even.

Let x be the number of units,

TCb = 960x

TCr = 80000 + 460x

960x = 80000 + 460x

**x = 160**

The number of units per year in which the alternatives break even is **160**

**----------------------------------------------------------------------------------------------------------------------------**

**6.** What is the cost breakdown structure? What are its purposes? What is included (or excluded)? How does it relate to a work breakdown structure?

**13.** Describe what is meant by a learning curve. How are learning curves developed? How can they be applied? What are some of the cautions that need to be addressed in applying a learning curve?

**16.** What is meant by a sensitivity analysis? What type of information may be derived from the accomplishment of such? Why is the accomplishment of a sensitivity analysis important?