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TCET 4140

November 20, 2013

Homework #5

**3-9.** Prepare a composite (weighted) index for housing construction costs in 2008, using the following data:





Weighted index= 153.51

**3-16.** Four hundred pounds of copper go into a 2,000- square-foot, newly constructed house. Today’s price of copper is $3.50 per pound. If the cost of copper is expected to increase 4.5% per year into the foreseeable future, what is the cost of copper going to be in a new 2,400 square foot house 10 years from now. Assume the cost capacity factor for increases of copper in houses equals 1.0.

Cin10years=(2400/2000)\*(400lbs)\*(3.50$/lb)\*(1.045)^10=2608.98

**3-17.** The structural engineering design section within the engineering department of a regional electrical utility corporation has developed several standard designs for a group of similar transmission line towers. The detailed design for each tower is based on one of the standard designs. A transmission line project involving 50 towers has been approved. The estimated number of engineering hours needed to accomplish the first detailed tower design is 126. Assuming a 95% learning curve,

**a.** What is your estimate of the number of engineering hours needed to design the eighth tower and to design the last tower in the project?

Z8=126(8^(log 0.95/log2))= 108.03 engineering hours

Z50=126(50^(log 0.95/log2))= 94.33 engineering hours

**b.** What is your estimate of the cumulative average hours required for the first five designs? (3.4)

T5= =126(4.66214)= 587.43

**3-19.** In a learning curve application, 846.2 work hours are required for the third production unit and 783.0 work-hours are required for the fifth production unit. Determine the value of *n* (and therefore *s*) in Equation (3-5).

Z3=846.2 hours

Z5=783 hours

U=3, U=5

 ln (0.6)^n= ln 1.08 n=ln1.08/ln 0.6=-0.15

n=10g5/logs = .0.15=log(s-2) = 0.707= s-2 =s=2,707