ME3302 Feb-May 2021

Assignment 01 (Due 19th Feb, 10pm)

Chapter 2 – end of chapter questions

2.3 A company produces two products in one of its plants: A and B. Annual production of Product A is 3,600 units and of Product B is 2,500 units. Product A has 47 components and Product B has 52 components. For Product A, 40% of the components are made in the plant, while 60% are purchased parts. For Product B, 30% of the components are made in the plant, while 70% are purchased. For these two products taken together, what is the total number of (a) components made in the plant and (b) components purchased?

2.5 The ABC Company is planning a new product line and a new plant to produce the parts for the line. The product line will include 8 different models. Annual production of each model is expected to be 900 units. Each product will be assembled of 180 components. All processing of parts will be accomplished in the new plant. On average, 6 processing operations are required to produce each component, and each operation takes an average of 1 min (including an allowance for setup time and part handling). All processing operations are performed at workstations, each of which includes a production machine and a human worker. The plant operates one shift. Determine the number of (a) components, (b) processing operations, and (c) workers that will be needed to accomplish the processing operations if each worker works 2,000 hr/yr.

2.6 The XYZ Company is planning a new product line and a new factory to produce the parts and assemble the final products. The product line will include 10 different models. Annual production of each model is expected to be 1,000 units. Each product will be assembled of 300 components, but 65% of these will be purchased parts (not made in the new factory). There is an average of 8 processing operations required to produce each component, and each processing step takes 30 sec (including an allowance for setup time and part handling). Each final unit of product takes 48 min to assemble. All processing operations are performed at work cells that include a production machine and a human worker. Products are assembled at single workstations consisting of one worker each plus assembly fixtures and tooling. Each work cell and each workstation require 25 m^2 of floor space and an additional allowance of 45% must be added to the total production area for aisles, work-in-process storage, shipping and receiving, rest rooms, and other utility space. The factory will operate one shift (the day shift, 2,000 hr/yr). Determine (a) how many processing and assembly operations, (b) how many workers (direct labor only), and (c) how much total floor space will be required in the plant.