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Abdul-Nasser El-Kassar* (abdulnasser.kassar@lau.edu.lb), P.O. Box 13-5053 Chouran, Beirut, 1102 2801, Lebanon. *An Economic Production Quantity Model for a Multi-Stage Production Process with Raw Material and Quality.*

A multi-stage production process that takes into account the various costs of raw material/components required at each stage. The raw material /components acquired from different suppliers are assumed to contain imperfect quality items. In this multi-stage process with N stages of production, all stages are assumed to start simultaneously at the beginning of the production cycle. The stages may be machines, production processes, or departments (assembly, finishing,...). The production rates at the various stages P_1, P_2, \dots, P_N are assumed to satisfy the condition $P_1 > P_2 > \dots > P_N > D$, where D is the demand rate of the finished product. This condition prevents the stages from being idle and allows inventory of semi-processed items to built-up between subsequent stages. A mathematical model is developed and a closed form formula for the optimal production quantity is derived. The costs of ordering, purchasing, screening, and holding the raw material/components as well as the cost of disposing of the imperfect quality items are incorporated into the model. Numerical examples are provided to illustrate the calculation of the optimal solution. (Received September 25, 2018)