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Abdul-Nasser El-Kassar* (abdulnasser.kassar@lau.edu.lb), Lebanese American University, Information Tech. & Oper. Man. Dept, P.O. Box 13- Chouran, Beirut, 1102 2801, Lebanon, and **Noura Yassine** (noura.yassein@bau.edu.lb), Faculty of Science, Mathematics and Computer Department, P.O. Box 11-5020, Beirut, 1102 2801, Lebanon. *Functions Involving The Maximum And Minimum Of Random Variables Arising From Inventory Models With Quality.*

Applications of the study of functions of several random variables can be found in various fields such as biology, engineering, and operations research. We present several extensions of classical inventory models that incorporate the effects of quality of the various types of products/components considered in the models. Each type of product/component is assumed to have a percentage of perfect quality items, a continuous random variable having a known probability distribution. We show that the optimal solution depends on deriving the probability distribution of a function of the random variables representing the percentages of perfect quality items, and develop a closed form formula approximating the optimal solution. The closed form formula is given in terms of the expected value. The proposed models give rise to functions involving the minimum, maximum and sum of the random variables. We describe how the probability functions and the expected values can be obtained. Expressions in the case of uniform and normal distributions are derived. Difficulties encountered when numerically determining via simulation the expected value of a function of random variables are discussed. For future research, we pose several open problems suggest several extensions of the inventory models . (Received September 26, 2017)