Abstract

Acceptance sampling plan has been widely used in industry. Researchers have worked a lot to explore further dimension and to increase the efficiency of sampling plan. In this research, multiple dependent state sampling plan by using cost model is proposed when quality characteristics of interest is normally distributed. Operating characteristics (OC) functions are derived for proposed plan for both known and unknown sigma cases. The tables are constructed for optimal plan parameters by increasing decision on preceding lots and also by decreasing consumer's risk while satisfying producer's and consumer's quality and risk requirements for both cases of sigma. Core objective of this research is the minimization of the total cost of the lot under inspection. Comparison with single acceptance sampling plan is made to show the efficiency of the proposed plan in terms of sample size and total cost. Results show that our proposed plan minimizes the ASN and total cost as compared to the conventional variable single sampling plan. More sample size is required for unknown sigma as compared to the known sigma under proposed plan at fixed level of producer's and consumer's quality and risk requirements. The cost of an outgoing failure item, inspection cost per item and internal failure cost also have an effect on the choice of optimal parameters of the plan. Our proposed MDS sampling plan by using cost model is more efficient than the SSP in terms of sample size and cost. Finally, an example is given to illustrate the proposed plan.