ABSTRACT

Inspection of unrefined materials, semi finished goods, or finished goods are one characteristic of quality assurance. Statistical quality control is used to control, improve and retain the quality. A most usual principle from the manufacturer's opinion is to make a decision on the action (to discharge or maintain the manufactured goods) which results in the lowest general cost. Acceptance sampling is considered to be the most significant field of statistical quality control. A sampling plan is a plan for acceptance sampling that exactly defines the parameter of the sampling process and the acceptance/rejection. Assuming that inspection is essential, Repetitive sampling inspection plan will be used. Repetitive sampling plan may increase the sampling efficiency in terms of cost and time. In this research, repetitive acceptance sampling plan by using cost model i-e life testing cost per item(C_i), cost of replacement(C_f), cost of an outgoing failure item (C_0) as the components of this cost model, is proposed. The proposed sampling plan recommends the discharge or maintenance of a product based upon results in lowest cost. The proposed plan gives an intermediate value in terms of sample size efficiency. It was assumed that the Quality Characteristic of the product is normally distributed. The proposed Repetitive Sampling plan is inspected separately when σ is known and σ is unknown. The two conditions which are always present in Acceptance Sampling named as Producer's risk (α) and Consumer's risk (β) for specified Acceptable Quality level (AQL) and Limiting Quality Level (LQL) are determined for Plan parameters. The Operating Characteristics (OC) function is derived to measures the efficiency to accept or reject a product. The proposed plan includes repetitive sampling plan as a special case and its advantage over the other acceptance sampling plan is discussed in terms of the sample size, total cost and average sample number. Comparison has been made to determine the efficiency of the proposed plan over the single sampling plan. It showed significant difference in the trend of sample size, total cost and average sample number according to various values of α, β, C_i, C_f and C_o in both cases of σ known and unknown. The proposed methodology can be used to determine the benefits of both producer and consumer to determine the desired level of satisfaction of the product. Extensive tables are provided to use proposed plans in practice.