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Evaluation of average outgoing quality (AOQ) for reliability acceptance sampling plan following log-logistic distribution

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Abstract
Quality of the product plays vital role in acceptance sampling plan and the quality of the lot is determined by using average outgoing quality (AOQ) which is the expected quality of lots after the application of sampling inspection. This paper introduces the designing of Average Outgoing Quality (AOQ) and Average Outgoing Quality Limit (AOQL) for Reliability acceptance sampling plan for life test that follows Log-Logistic distribution. The procedure for designing a single sampling plan indexed through the Average Outgoing Quality (AOQ) is stated. A statistical software(R) is used to simulate the procedure developed and graph are constructed for the selection of AOQ values for a sampling plan under the Log-logistic model.

Keywords: Acceptance sampling, life test, log-logistic distribution, probability of acceptance, average outgoing quality (AOQ), average outgoing quality limit (AOQL)

1. Introduction
Acceptance sampling is one of the major areas of statistical quality control. Acceptance sampling is the methodology that deals with procedures by which decision to accept or reject the lot based on the results of the inspection of samples. Acceptance sampling prescribes a procedure that, if applied to a series of lots, will give a specified risk of accepting lots of given quality. In other words, acceptance sampling yields quality assurance and reduce the cost of inspection. The acceptance sampling could be classified in to sampling plans by attributes and sampling plans by variable. In attribute sampling plan, several sampling plans are available. For example, single sampling plan, double sampling plan and multiple sampling plan, continuous sampling plan etc. If the quality characteristic is regarding the life time of the products, then the acceptance sampling procedure is called a life test. Here it is common practice to truncate the experiment during the sampling process if no failure occurs within the experimental time period or the number of failure exceeds the specified number. Many authors have discussed acceptance sampling based on truncated life test. Epstein (1954) [1] and Sobel and Tischendrof (1959) [2] for the exponential model and The result were extended by Goode and Kao (1961) [3] for Weibull distribution, by Gupta and Groll (1961) [4] for Gamma distribution, by Kantam and Rosaiah (1998) [5] for Half Logistic distribution, by Kantam, Rosaiah and Srinivasa Rao (2001) [6] for log-logistic model, by Rosaiah, Kantam and Santosh kumar (2006) [7] for Exponentiated Log-Logistic Distribution,by Baklizi and El Masri (2004) [8] for Birnbaum-Saunders distribution, by Tsai and Wu (2006) [9] for Generalize Rayleigh distribution and by Balakrishnan *et al.* (2007) [10] for Generalized Birnbaum-Saunders distribution. Muhammad Hanif, Munir Ahmad and Abdur Rehman (2011) [11] developed economic reliability acceptance sampling plan from truncated life tests based on the Burr Type XII percentiles.
According to ANSI / ASQC Standard A2 (1987) defines AOQ as “the expected quality” of outgoing product following the use of an acceptance sampling plan for a given value of incoming product quality and The maximum AOQ over all possible levels of incoming quality is termed as AOQL. Dodge and Romig (1959) [12] have proposed a procedure for selection of a single sampling plan (SSP) indexed through the AOQL by minimizing the average total

inspection. Soundararajan (1981) [13] has suggested a procedure for the selection of an SSP in terms of the acceptable quality level (AQL) and AOQL.

This paper we develop average outgoing quality and average outgoing quality limit for reliability acceptance sampling plan following log-logistic distribution when the quality characteristics follow Poisson condition. In Section 2 explains the definition of Log-Logistic distribution, Section 3 deals with the designing of the sampling plan using Log-Logistic distribution, Section 4 provides the desired operating characteristics and producer's risk, finally, Section 5 provide the average outgoing quality and average outgoing quality limit using Poisson approximation with construction of tables and numerical illustration.

2. Log-Logistic distribution.

Let us assume that the distribution of the life of a product is follow a Log-Logistic distribution whose cumulative distribution function $F(t;\sigma)$ and probability density function $f(t;\sigma)$ are given respectively by

$$F(t:\sigma)=\frac{(\frac{t}{\sigma})^{\beta}}{[1+(\frac{t}{\sigma})^{\beta}]}\quad t\geq 0,\ \beta>0,\ \sigma>0 \tag{1}$$

$$f(t:\sigma)=\frac{\beta(\frac{t}{\sigma})^{\beta-1}}{\sigma[1+(\frac{t}{\sigma})^{\beta}]^{2}}\quad t\geq 0,\ \beta>0,\ \sigma>0 \tag{2}$$

Where β and σ may be called the shape and scale parameter respectively. The Log-Logistic distribution has been studied in detail by Shah & Dave (1963) [14] and Tadikamalla & Johnson (1982) [15].

3. Designing of sampling plans using Log-Logistic distribution

A sampling plan consists of (i) the number of units, n (ii) an acceptance number c such that if c or fewer failure occur during the test time t, the lot is accepted (iii) a ratio t/σ_0 where σ_0 is the specified average life. The sampling plan is used to support the decision of the consumer i.e., the probability of accepting a bad lot (one for which the true σ is smaller than the required σ_0) should not exceed the value $1-p*$ with $p*$ is a lower bound for the probability that a lot of true σ below σ_0 is rejected by the sampling plan. For fixed $p*$ the sampling plan is characterized by $(n,c,t/\sigma_0)$. If $p=F(t;\sigma)$ is small and n is large then the Binomial probability is approximated by Poisson probability with parameter $\lambda=np$ so that the problem is to determine the smallest positive integer n for given values of c and t/σ_0 such that:

$$L(p)=\sum_{r=0}^{c}\frac{\exp(-\lambda)(\lambda)^{r}}{r!}\leq 1-p* \tag{3}$$

Where $\lambda=nF(t;\sigma_0)$ and $F(t:\sigma_0)$ is the failure probability and is depends only on the ratio t/σ. Hence the experiment needs to specify only this ratio. The minimum values of n satisfying inequality (5) had been developed by Katam, Rosaiah and Srinivasa Rao (2001) [6] for Log-Logistic distribution.

4. Operating characteristic function

The operating characteristic of the sampling plan $(n,c,t/\sigma_0)$ gives the probability of accepting the lot. This probability is given by

$$L(p)=\sum_{r=0}^{c}\frac{\exp(-\lambda)(\lambda)^{r}}{r!} \tag{4}$$

Where $\lambda=nF(t;\sigma)$ and $F(t;\sigma)$ is treated as a function of σ-the lot quality parameter. The values of operating characteristics as a function of σ/σ_0 for a sampling plan are given in Table 1 for $\beta=2$.

The producer's risk (α) is the probability of rejecting a lot when $\sigma\geq\sigma_0$ for a given producer's risk (α). One may interested in knowing what value of σ/σ_0 will ensure the producer's risk less than or equal to α if a sampling plan under discussion is adopted. This value of σ/σ_0 is the smallest number $\sigma/\sigma_0(>1)$ for which $F[(t/\sigma_0)(\sigma_0/\sigma)]$ satisfies the inequality

$$L(p)=\sum_{r=0}^{c}\frac{\exp(-\lambda)(\lambda)^r}{r!}\geq 1-\alpha \tag{5}$$

For a given sampling plan $(n,c,t/\sigma_0)$ specified confidence level $P*$, the minimum values of σ/σ_0 satisfying inequality (3) had been developed by Kantam, Rosaiah and Srinivasa Rao (2001) [6] for Log-Logistic distribution.

5. Average Outgoing Quality (AOQ)

The average outgoing quality (AOQ) is the expected average quality level of the outgoing component for a given value of incoming component quality. The equation for calculation of the average outgoing quality is as follows.

$$AOQ=p.\frac{P_a(p)(N-n)}{N}=p.P_a(p)(1-\frac{n}{N}) \tag{6}$$

If all lots come with a defect (failure) of exactly p , where $p=F(t:\sigma_0)$ is the failure probability which depends on σ_0. The OC curve for the Reliability acceptance sampling plan for $(n,c,t/\sigma_0)$ indicates a probability $Pa(p)$ of accepting such a lot, in the long run. Assuming the quality characteristic follows Poisson condition it becomes

$$AOQ=p\,P_a(p)=p\,\sum_{r=0}^{c}\frac{\exp(-\lambda)(\lambda)^r}{r!} \tag{7}$$

A plot of the life time against the AOQ is called the AOQ curve in reliability acceptance sampling plan. The maximal ordinate on the AOQ curve is called AOQL which is an important characteristic of the acceptance sampling plan because it represents the worst possible long term AOQ.

$$AOQL=Max(AOQ) \tag{8}$$

The values average outgoing quality (AOQ) and average outgoing quality limit (AOQL) of the sampling plan $(n,c,t/\sigma_0)$ for a given $P*$ under Log-Logistic distribution are given in Table 2 and Table 3 for $\beta=2$.

5.1 Construction of the Table

Step 1: Set the value of $c=0,1,\ldots,10,\ t/\sigma_0=0.628$ and $\beta=2$.

Step 2: Find the smallest value of n satisfying $L(p)=\sum_{r=0}^{c}\frac{\exp(-\lambda)(\lambda)^r}{r!}\leq 1-P*$

Where $P*=0.75,0.90,0.95,0.99$ is the probability of rejecting the bad lot.

Step 3: For the evaluated n find $L(p)=\sum_{r=0}^{c}\frac{\exp(-\lambda)(\lambda)^r}{r!}$ such that

$p=F[(t/\sigma_0)(\sigma_0/\sigma)]$, Where $\sigma/\sigma_0=1,\ 1.25,\ \ldots,\ 2.75.$

Step 5: Using p and $P_a(p)$ find $p.P_a(p)$ which gives the AOQ values are given in Table 2.

Step 6: Use Max (AOQ) which gives AOQL are given in Table 3.

5.2 Description of the Tables and Numerical Illustration

In reliability acceptance sampling plan guarantees a certain average quality as a result of the received lots. Assume that the life time distribution is a Log-Logistic distribution with $\beta=2$ and that the experimenter is interested in knowing that the true unknown average lifetime is at least 1000 hours. Let the consumer's risk be set to $1-P*=0.25$. It is desired to stop the experiment at $t=628$ then for an acceptance number $c=2$, the required samples size $n=31$, Operating characteristic values and the values of average outgoing quality corresponding to the value of $P*=0.75$ and $c=2$, $t/\sigma_0=0.628$ is given in the Table 1 and Table 2 are,

σ/σ_0	1	1.25	1.5	1.75	2	2.25	2.5	2.75
$Pa(p)$	0.2278	0.5665	0.8149	0.9318	0.9763	0.9918	1	1
AOQ	0.0647	0.1142	0.1215	0.1063	0.0876	0.0717	0.0592	0.0495

This shows that if the true mean life is equal to required mean life i.e. $(\sigma/\sigma_0 = 1)$ Then the producer's risk is approximately 0.7722. The producer's risk is about zero when the true mean life is 2.5 or more times the required mean life then the producer's risk is approximately zero.

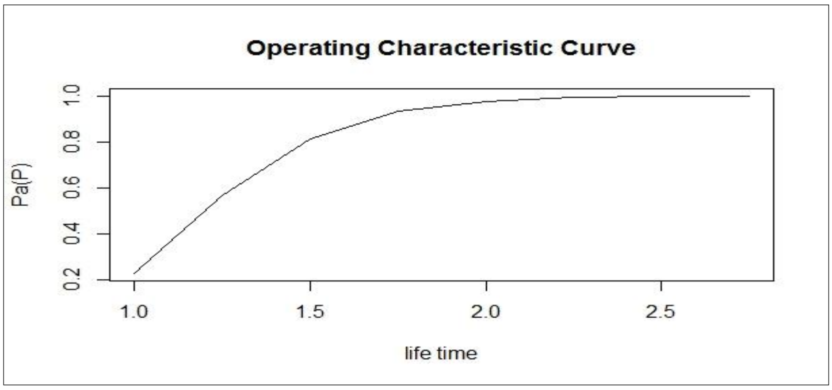

Fig 1: Shows the OC curve for the sampling plan $(n = 31, c = 6, t/\sigma_0 = 0.628)$ with $P^* = 0.75$ under Log-Logistic distribution when $\beta = 2$.

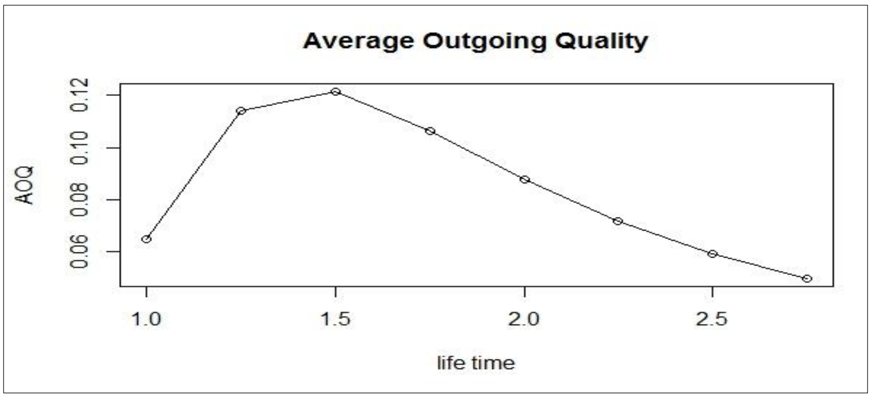

Fig 2: Shows the AOQ curve for the sampling plan $(n = 31, c = 6, t/\sigma_0 = 0.628)$ with $P^* = 0.75$ under Log-Logistic distribution when $\beta = 2$.

Fig 1. AOQ Curve for Log - Logistic Distribution
From the above AOQL is 0.1215.

Table 1: Operating characteristic values of the sampling plan $(n, c, t/\sigma_0)$ for a given P^*, under Log-Logistic distribution $(\beta = 2)$ using Poisson approximation

P*	**c**	**n**	**t/σ₀**	**1**	**1.25**	**1.5**	**1.75**	**2**	**2.25**	**2.5**	**2.75**
0.75	0	5	0.628	0.2431	0.3651	0.4744	0.5653	0.6384	0.6967	0.7432	0.7805
0.75	1	10	0.628	0.2263	0.4018	0.5607	0.6841	0.7734	0.8362	0.8802	0.9111
0.75	2	14	0.628	0.2441	0.4643	0.6528	0.7841	0.8671	0.9175	0.948	0.9665
0.75	3	18	0.628	0.2525	0.5093	0.7175	0.8473	0.9191	0.9568	0.9765	0.9869
0.75	4	23	0.628	0.2231	0.5066	0.7385	0.874	0.9414	0.9727	0.9871	0.9937
0.75	5	27	0.628	0.2268	0.5389	0.7809	0.9077	0.9629	0.9851	0.9939	0.9974
0.75	6	31	0.628	0.2287	0.5665	0.8149	0.9318	0.9763	0.9918	0.9971	0.9989
0.75	7	35	0.628	0.2294	0.5907	0.8426	0.9493	0.9847	0.9955	0.9986	0.9995
0.75	8	39	0.628	0.2293	0.6121	0.8655	0.9621	0.9901	0.9974	0.9993	0.9998
0.75	9	43	0.628	0.2285	0.6313	0.8847	0.9715	0.9935	0.9985	0.9996	0.9999
0.75	10	47	0.628	0.2274	0.6487	0.9007	0.9785	0.9958	0.9991	0.9998	0.9999
0.9	0	9	0.628	0.0784	0.163	0.2613	0.3581	0.4458	0.5218	0.5861	0.6401
0.9	1	13	0.628	0.1183	0.2635	0.4228	0.5635	0.6746	0.7579	0.8189	0.8633
0.9	2	19	0.628	0.0965	0.2642	0.4615	0.6314	0.7558	0.8399	0.8947	0.9301
0.9	3	24	0.628	0.0935	0.2886	0.5196	0.7056	0.8283	0.9015	0.9435	0.9671
0.9	4	29	0.628	0.0886	0.3064	0.5655	0.761	0.877	0.9383	0.969	0.9842
0.9	5	33	0.628	0.0968	0.3475	0.6297	0.8207	0.9199	0.9652	0.9848	0.9933
0.9	6	38	0.628	0.0895	0.3568	0.6595	0.8516	0.9414	0.9777	0.9915	0.9967
0.9	7	42	0.628	0.0949	0.3902	0.7069	0.8875	0.9614	0.9873	0.9958	0.9985

0.9	8	46	0.628	0.0993	0.4205	0.7471	0.9145	0.9746	0.9927	0.9979	0.9994
0.9	9	51	0.628	0.0907	0.4236	0.7641	0.928	0.9811	0.9953	0.9988	0.9996
0.9	10	55	0.628	0.0938	0.4498	0.7953	0.9449	0.9874	0.9973	0.9994	0.9998
0.95	0	11	0.628	0.0445	0.1089	0.1938	0.2851	0.3726	0.4515	0.5205	0.5797
0.95	1	16	0.628	0.0598	0.168	0.3114	0.4553	0.5795	0.6785	0.7543	0.8113
0.95	2	23	0.628	0.0428	0.1589	0.3339	0.5124	0.6593	0.7671	0.8418	0.8922
0.95	3	28	0.628	0.0447	0.186	0.3998	0.6037	0.7548	0.8528	0.9124	0.9476
0.95	4	33	0.628	0.0446	0.2073	0.4544	0.6746	0.8216	0.906	0.9509	0.9744
0.95	5	38	0.628	0.0435	0.2245	0.5004	0.7307	0.8692	0.9394	0.9724	0.9872
0.95	6	42	0.628	0.0489	0.2599	0.5639	0.7919	0.9119	0.9646	0.986	0.9944
0.95	7	47	0.628	0.0463	0.2715	0.5973	0.8262	0.9348	0.977	0.992	0.9972
0.95	8	52	0.628	0.0435	0.2814	0.6266	0.8541	0.9515	0.985	0.9954	0.9985
0.95	9	56	0.628	0.0468	0.3103	0.6721	0.8867	0.9672	0.9912	0.9976	0.9994
0.95	10	60	0.628	0.0498	0.3376	0.7121	0.9121	0.9778	0.9948	0.9988	0.9997
0.99	0	17	0.628	0.0082	0.0325	0.0792	0.1437	0.2175	0.2926	0.3645	0.4305
0.99	1	23	0.628	0.0112	0.0546	0.1434	0.2627	0.3889	0.505	0.6039	0.6844
0.99	2	30	0.628	0.0094	0.0599	0.1765	0.3354	0.4955	0.6313	0.7357	0.8121
0.99	3	36	0.628	0.009	0.0694	0.2169	0.4128	0.5956	0.7356	0.8316	0.8937
0.99	4	41	0.628	0.0101	0.0855	0.2699	0.4987	0.6911	0.8214	0.8998	0.9444
0.99	5	47	0.628	0.0088	0.0898	0.2995	0.5526	0.7502	0.8709	0.9357	0.9684
0.99	6	52	0.628	0.0092	0.1026	0.3442	0.6171	0.8091	0.9129	0.9619	0.9835
0.99	7	57	0.628	0.0093	0.1144	0.3855	0.6723	0.8543	0.9414	0.9775	0.9915
0.99	8	62	0.628	0.0093	0.1252	0.4236	0.7195	0.8888	0.9606	0.9867	0.9956
0.99	9	67	0.628	0.0091	0.1351	0.4588	0.7597	0.9152	0.9735	0.9922	0.9977
0.99	10	72	0.628	0.0088	0.1443	0.4915	0.7941	0.9353	0.9822	0.9954	0.9988

Table 2: Average outgoing values of the sampling plan $(n, c, t/\sigma_0)$ for a given P^*, under Log-Logistic distribution $(\beta = 2)$.

P*	**c**	**n**	**t/σ_0**	**1**	**1.25**	**1.5**	**1.75**	**2**	**2.25**	**2.5**	**2.75**
0.75	0	5	0.628	0.0687	0.0735	0.0707	0.0645	0.0573	0.0504	0.0441	0.0387
0.75	1	10	0.628	0.064	0.0809	0.0836	0.078	0.0694	0.0604	0.0522	0.0452
0.75	2	14	0.628	0.069	0.0936	0.0974	0.0895	0.0778	0.0663	0.0563	0.0479
0.75	3	18	0.628	0.0714	0.1026	0.107	0.0967	0.0825	0.0692	0.0579	0.0489
0.75	4	23	0.628	0.0631	0.1021	0.1101	0.0997	0.0845	0.0703	0.0586	0.0493
0.75	5	27	0.628	0.0642	0.1086	0.1165	0.1036	0.0864	0.0712	0.0589	0.0494
0.75	6	31	0.628	0.0647	0.1142	0.1215	0.1063	0.0876	0.0717	0.0592	0.0495
0.75	7	35	0.628	0.0648	0.119	0.1257	0.1083	0.0884	0.0719	0.0593	0.0495
0.75	8	39	0.628	0.0648	0.1234	0.1291	0.1097	0.0888	0.0721	0.0593	0.0496
0.75	9	43	0.628	0.0646	0.1272	0.1319	0.1108	0.0892	0.0722	0.0593	0.0496
0.75	10	47	0.628	0.0643	0.1307	0.1343	0.1116	0.0894	0.0722	0.0593	0.0496
0.9	0	9	0.628	0.0222	0.0328	0.0389	0.0408	0.04	0.0377	0.0348	0.0317
0.9	1	13	0.628	0.0335	0.0531	0.0631	0.0643	0.0606	0.0547	0.0486	0.0427
0.9	2	19	0.628	0.0273	0.0532	0.0688	0.072	0.0678	0.0607	0.0531	0.0461
0.9	3	24	0.628	0.0264	0.0582	0.0775	0.0805	0.0743	0.0652	0.056	0.0479
0.9	4	29	0.628	0.0251	0.0618	0.0844	0.0868	0.0787	0.0678	0.0575	0.0488
0.9	5	33	0.628	0.0274	0.07	0.0939	0.0936	0.0826	0.0698	0.0585	0.0492
0.9	6	38	0.628	0.0253	0.0719	0.0984	0.0972	0.0845	0.0707	0.0588	0.0494
0.9	7	42	0.628	0.0268	0.0786	0.1054	0.1012	0.0863	0.0714	0.0591	0.0495
0.9	8	46	0.628	0.0281	0.0847	0.1114	0.1043	0.0875	0.0717	0.0592	0.0495
0.9	9	51	0.628	0.0257	0.0854	0.1139	0.1058	0.088	0.0719	0.0593	0.0496
0.9	10	55	0.628	0.0265	0.0906	0.1186	0.1078	0.0886	0.0721	0.0593	0.0496
0.95	0	11	0.628	0.0126	0.0219	0.0289	0.0325	0.0334	0.0326	0.0308	0.0287
0.95	1	16	0.628	0.0169	0.0338	0.0464	0.0519	0.052	0.049	0.0448	0.0402
0.95	2	23	0.628	0.0121	0.032	0.0498	0.0585	0.0592	0.0554	0.0499	0.0442
0.95	3	28	0.628	0.0127	0.0375	0.0596	0.0688	0.0677	0.0616	0.0542	0.0469
0.95	4	33	0.628	0.0126	0.0418	0.0678	0.0769	0.0737	0.0655	0.0564	0.0483
0.95	5	38	0.628	0.0123	0.0453	0.0746	0.0834	0.078	0.0678	0.0577	0.0489
0.95	6	42	0.628	0.0139	0.0524	0.0841	0.0904	0.0818	0.0697	0.0585	0.0493
0.95	7	47	0.628	0.0131	0.0547	0.0891	0.0943	0.0839	0.0706	0.0589	0.0494
0.95	8	52	0.628	0.0123	0.0567	0.0935	0.0975	0.0854	0.0713	0.0591	0.0495
0.95	9	56	0.628	0.0133	0.0625	0.1002	0.1012	0.0868	0.0716	0.0592	0.0495
0.95	10	60	0.628	0.0141	0.068	0.1062	0.1041	0.0878	0.0719	0.0593	0.0496
0.99	0	17	0.628	0.0023	0.0066	0.0118	0.0164	0.0195	0.0212	0.0216	0.0213
0.99	1	23	0.628	0.0032	0.011	0.0214	0.0299	0.0349	0.0365	0.0358	0.0339
0.99	2	30	0.628	0.0027	0.0121	0.0263	0.0383	0.0445	0.0456	0.0437	0.0403
0.99	3	36	0.628	0.0026	0.0139	0.0324	0.047	0.0535	0.0532	0.0494	0.0443
0.99	4	41	0.628	0.0028	0.0172	0.0403	0.0569	0.062	0.0594	0.0534	0.0468
0.99	5	47	0.628	0.0025	0.0181	0.0447	0.0631	0.0673	0.0629	0.0555	0.0479

0.99	6	52	0.628	0.0026	0.0207	0.0513	0.0704	0.0726	0.0659	0.0571	0.0487
0.99	7	57	0.628	0.0026	0.0231	0.0575	0.0767	0.0767	0.068	0.058	0.0491
0.99	8	62	0.628	0.0026	0.0252	0.0632	0.0821	0.0798	0.0694	0.0586	0.0493
0.99	9	67	0.628	0.0026	0.0272	0.0684	0.0867	0.0821	0.0704	0.0589	0.0495
0.99	10	72	0.628	0.0025	0.0291	0.0733	0.0906	0.0839	0.0709	0.0591	0.0495

Table 3: The values of average outgoing quality limit (AOQL) of the sampling plan $(n, c, t/\sigma_0)$ for a given P^*, under Log-Logistic distribution $(\beta = 2)$.

P*	c	n	t/σ₀	AOQL
0.75	0	5	0.628	0.0735
0.75	1	10	0.628	0.0836
0.75	2	14	0.628	0.0974
0.75	3	18	0.628	0.107
0.75	4	23	0.628	0.1101
0.75	5	27	0.628	0.1165
0.75	6	31	0.628	0.1215
0.75	7	35	0.628	0.1257
0.75	8	39	0.628	0.1291
0.75	9	43	0.628	0.1319
0.75	10	47	0.628	0.1343
0.9	0	9	0.628	0.0408
0.9	1	13	0.628	0.0643
0.9	2	19	0.628	0.072
0.9	3	24	0.628	0.0805
0.9	4	29	0.628	0.0868
0.9	5	33	0.628	0.0939
0.9	6	38	0.628	0.0984
0.9	7	42	0.628	0.1054
0.9	8	46	0.628	0.1114
0.9	9	51	0.628	0.1139
0.9	10	55	0.628	0.1186
0.95	0	11	0.628	0.0334
0.95	1	16	0.628	0.052
0.95	2	23	0.628	0.0592
0.95	3	28	0.628	0.0688
0.95	4	33	0.628	0.0769
0.95	5	38	0.628	0.0834
0.95	6	42	0.628	0.0904
0.95	7	47	0.628	0.0943
0.95	8	52	0.628	0.0975
0.95	9	56	0.628	0.1012
0.95	10	60	0.628	0.1062
0.99	0	17	0.628	0.0216
0.99	1	23	0.628	0.0365
0.99	2	30	0.628	0.0456
0.99	3	36	0.628	0.0535
0.99	4	41	0.628	0.062
0.99	5	47	0.628	0.0673
0.99	6	52	0.628	0.0726
0.99	7	57	0.628	0.0767
0.99	8	62	0.628	0.0821
0.99	9	67	0.628	0.0867
0.99	10	72	0.628	0.0906

6. Conclusion
Quality of the product plays vital role in reliability acceptance sampling plan because in any manufacturing sector, quality is a measure or state of being free from defects (failure) So that average outgoing quality is an important measure to ensure the quality of the products. In this study, we have proposed Average outgoing Quality (AOQ) and AOQL for the truncated life test when the life time of the product follows a log-logistic distribution since the log-logistic distribution has been shown to be a useful model to analyze the system reliability studies.

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