North South University : Department of Mathematics & Physics

Course Name: Probability & Statistics (MAT361)

Final Assignment   Section-7

Total Marks - 30

Answer all the questions

1) Suppose a manufacturer has 10 pistons. On the average, 80% of his pistons are accepted. What is the probability that at least 8 pistons are rejected because they are either oversize or undersize?

2) Suppose rickshaw pass through Aftabuddin Ahmed sorok at an average rate 300 per hour.

    a. Find the probability that none passes in a given minute. [3]

    b. What is the expected number passing in two minutes? [3]

3) Suppose X ~ N(3 , 4). If sample size = 100, P($\bar{X}$ > 2) = ?. Draw a figure. [4+2]

4) The mean lifetime of a sample of 100 energy bulbs produced by a company is computed to be 1750 hours with a variance of 100 hours. If μ is the mean lifetime of all the bulbs produced by the company, test the alternative hypothesis $\mu > 1600$ hours at 10% level of significance.

5) Suppose we are evaluating the effect of a medical treatment, and we enroll 10 mice into our study, then randomly assign 5 subjects to the

treatment group and 5 subjects to the control group. Then the survival time of this mice are recorded which are given below:

Treatment group	Control group
15	23
16	21
20	14
22	28
25	30

Is there any difference between control group & treatment group? Test this at 1% level of significance.