Istanbul Technical University
Faculty of Civil Engineering, Department of Hydraulics

PROBABILITY AND STATISTICS
Homework II

1.) The mean length of 500 hand made machine parts is 151mm and the standard deviation is 15 mm. Assuming that the lengths are normally distributed, find how many parts measure;

      a-) Between 120 and 155 mm

      b-) More than 185 mm.

2.) The maximum annual wave height for NNW direction is given in following table for possible marina construction in Karacabey – Bayramdere. What is the probability of wave higher than 3, 4 and 6m. if Gumble distribution assumed?

Note : Wave heights will be calculated by using both analytical method and Gumble probability paper (graphical method).

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Wave heights	2.0	0.65	0.45	1.8	1.0	2.5	1.7	0.6	2.0	3.1	0.25

3.) The mean lifetime of a sample of 100 fluorescent light bulbs produced by a company is computed to be 1570 hours with a standard deviation of 120 hours. If μ is the mean lifetime of all bulbs produced by company, test hypothesis $\mu = 1600$ hours against the alternative hypothesis $\mu \neq 1600$ hours, using a level of significance of $\alpha = 0.05$ and $\alpha = 0.01$.

4.) Test the hypothesis $\mu = 1600$ hours against the alternative $\mu < 1600$ hours, using a level of significance of $\alpha = 0.05$ and $\alpha = 0.01$ for previous example.