Module 19 self-assessment

Question 1

For a sample of 100 AAA batteries from a certain manufacturer the average life span was found to be 1570 hours with a variance of 14400 hours^2. If μ is the true mean of all AAA batteries produced by the same company test the hypothesis $\mu = 1600$ hours against the alternative hypothesis $\mu \neq 1600$ hours at a level of significance 0.01 and find the p value of this test. Further compute the probability of a type II error if the true mean life is 1590 hours.

Question 2

A machine produces washers with a specification of having mean thickness of 0.05 inch. To determine if the machine is in good working order a sample of 10 washers is chosen at random from a new bunch whose mean thickness was measured to be 0.053 inch with a standard deviation of 0.003 inch. Test the hypothesis that the machine is in good working condition, i.e. it operates within its specs, at $\alpha = 0.05$ and $\alpha = 0.01$.

Question 3

A laboratory test to measure the breaking strength of 6 composite polymer rods showed a mean breaking strength of 7750 lb and a standard deviation of 145 lb, whilst their manufacturer claims that these should not break with a force less than 8000 lb. Can you support the manufacturer's claims on the evidence of the above test at $\alpha = 0.05$?