The more details in your answer, the more credits you obtain.

1. Judge if the following statements are correct and give your reason. (No point without reasons).

    (1) Let p be the probability of a product's failure before time T. Take n new products, observe them until time T and find n_F failures. Thus p is equal to n_F/n.(10%)

    (2) To test $H_0: \overline{X} = 6$, we can get a sample and use either T-test or Z-test.(5%).

    (3) In the standard normal distribution F(), we have F(-2)=1-F(2) and F'(1)=-F'(-1). (' is the sign of differentiation)(10%)

2. Give three different distributions whose variance and mean are related in nature and their relations.(18%)

3. There are two production lines for a product. We collected two samples, one from each line. What do we compare usually and how to compare for your comparisons.(20%)

4. In the normal distribution what is the relation between (1) mean and median (5%) (2) standard deviation and interquantile range(10%). (3) mean and skewness.(5%)

5. What information are needed for us to determine the sample size for testing if a production process is out of target(mean)(10%)and how to determine(7%)