**Advance Statistics - Final Assignment**

* *Answer all questions and submit your final report in word file.*
* *Ensure that all steps are documented in an appropriate order, including output obtained from calculation performed using Minitab.*

**Question 1 (20 marks)**

A salary survey was conducted to explore the monthly salary of a sample of employees from different education background, who are working in public and private organizations.

Use the **Salary Data** Sheet provided to perform the following tasks and comment on the results:

1. Identify the type of each parameter (Qualitative & Quantitative).
2. Create summary table for Job Level.
3. Draw bar graph for Education.
4. Draw pie chart for Sector.
5. Draw a histogram for salary.
6. Calculate descriptive statistics of Salary and test its normality.
7. Draw box blot for Age and determine the existence of outliers.
8. Draw a Pareto chart for total salary of each Discipline & present your conclusion about the vital few.

**Question 2 (20 marks)**

1. You are working in TV set factory. The manufactured TV has a normal distribution life with ** = 3,500 working hours and ** = 200 hours.
2. What is the probability that a TV will work less than 3,350 hours?
3. What is the probability that a TV will work more than 3,750 hours?
4. What is the probability that a TV will work between 3,350 & 3,750 hours?
5. What is TV life that you are confident 95% it will keep working?
6. You are working in a bank. You have collected enough data to determine the average time needed to serve one customer and found that it follows a normal distribution with ** = 4.78 minutes and ** = 1.32 minutes.
7. What is the probability that you will serve 10 customers every hour?
8. What is the probability that you will serve more than 15 customers every hour?
9. What is the probability that you will serve between 10 & 15 customers every hour?
10. What is the number of customers you will be 95% confident that you will serve every hour?
11. You are thinking about signing a contract, as a supplier for one of the biggest global exporting company. The draft contract obligates you to deliver 20 tons of orange every week. The delivery process of orange during this season follows a normal distribution with ** = 22.5 tons every week and ** = 3.2 tons.
12. What is the probability that you will achieve the contract terms?
13. What is the orange quantity that you will be 95% confident that you will deliver every week?

**Question 3 (15 marks)**

A supplier was requested to deliver order within 25 to 35 days after receiving the Purchase Order.

Use **Delivery Time Data** to perform the following:

1. Calculate the capability indices and provide your comments on the results.
2. Provide your recommendation to improve the supplier performance.

**Question 4 (10 marks)**

Cycle Time was measured and found to be a non-normal distribution.

Use **Cycle Time** **Data** to perform the following:

1. Transform Cycle Time data using Box-Cox transformation.
2. Transform Cycle Time data using Johnson transformation.

**Question 5 (20 marks)**

Car manufacturing plant is studying the stability of its processes.

Use **Car Factory Data** to perform the following:

1. Provide your comments on the stability of daily production.
2. Provide your comments on the stability of defective cars.
3. Provide your comments on the stability of car defects.

**Question 6 (15 marks)**

Sales manager wishing to predict the future sales.

Use **Sales Data** to perform the following:

1. Provide your comments on the sales trend.
2. Provide your comments on the sales seasonality.
3. Provide your comments on the obtained accuracy model.
4. Predict the upcoming 3 quarter sales.