MATH 154, Final Exam, Part II, Spring 2021   Name _____

Instructions: For this portion of the exam, answer the questions in words or by creating graphs or tables in Excel. You will be asked to submit your work (scan this portion of the exam or compile photo images of the pages in a single document), and you will be asked to submit your Excel work file. You will only be able to submit two files to the Canvas Final Exam Part 2.

If you need data for the exam, use the same file as you used for Part 1: **154final_data.xlsx.**

Academic Integrity Statement

I affirm that, I, _____ (student name), do attest that I alone am completing the problems on this test without receiving unauthorized assistance. I understand that violations of academic integrity may result in sanctions, up to and including expulsion from the college.

_____(Student Signature)

_____(Student ID number)

Attach a copy of your photo ID to the online submission (there is a question drop box for it). The ID must be a photo ID. A Driver's license, School ID (NOVA or otherwise), or a work ID are acceptable as long as it contains your full name and photo.

1. Using the same data on Sheet 10, make a histogram of education. Label your graph appropriately with axis labels and a descriptive title.

2. Using the same data on Sheet 10, make a boxplot. **Does the boxplot support your description of the skew or symmetry above? Explain why or why not.** (5 points)

3. On Sheet 11, make a pivot table of the data of drinking and smoking levels. Note that the coding is N=non, O=occasional, H=high, S=smoking, D=drinking. **Copy the table below**. (6 points)

4. Using the data on Sheet 11, make a summary table of drinking data, and make a bar graph of it. Label it appropriately and **write a sentence that summarizes what it tells you**. (6 points)

5. Employees are surveyed and a scatterplot of the relationship between total experience (work experience plus education) is plotted against salary. A linear regression line is found, and the equation and coefficient of determination is on the graph. Use this graph to answer the questions that follow.

Total Experience vs. Salary $y = 817.43x + 23479$ $R^2 = 0.6043$
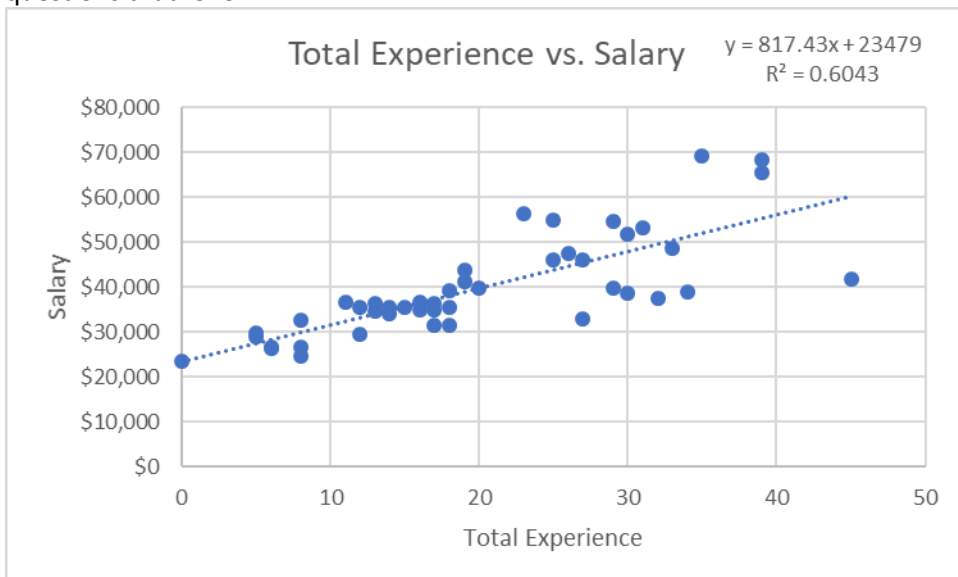
a. State the slope of the regression line and **interpret it in the context of the problem**. (5 points)

b. State the y-intercept and **interpret it in the context of the problem**. (5 points)

c. What is the proportion of the variability in salary that can be explained by total experience? (5 points)

6. A screenshot below shows a small dataset, sample size 10. Based on the information shown, write the Excel formulas you'd need to calculate the requested values. (5 points each)

	AF	AG	AH	AI	AJ	AK
1		20				
2		22				
3		26				
4		23				
5		24				
6		18				
7		32				
8		24				
9		31				
10		28				
11						

a. What formula would be needed to find the median of the data?

b. What formula would be needed to find the 75th percentile?

7. Under what circumstances is it better to use a median as a measure of central tendency than the mean? (4 points)

8. Translate the logical and mathematical notation $\exists x(x^2 = 4)$. Then find the value of x. (6 points)

9. The screenshot below shows how scientific notation appears in Excel. Write this number in standard scientific notation as it appears in normal mathematical notation and not in "computer" formatting. (4 points)

	U	V	W
1			
2			
3		3.17E-05	
4			

10. The 30th percentile of heights of men in the United States is approximately 68.2" or 5'8.2''. What does this statement mean in plain English? (5 points)

11. Using the screenshot of an Excel sheet below to **write a formula** that will evaluate the expression $\dfrac{A+C^2}{D-\sqrt{B}}$ using the cell references where the values are in the sheet. (8 points)

	A	B	C	D	Formula
3	A	B	C	D	Formula
4	13	16	13	8	
5					

12. Explain why the graph below is a bad graph. There are at least two problems with it. (8 points)