1. [5 marks] In your own words, explain the difference between data, information, and knowledge.

- Data is raw, unorganized measurements or observations, while information is data that has been more organized and given meaning. Knowledge is the understanding that is obtained from the information.

2. [5 marks] What are the different types of qualitative research? In your own words, define and give an example for each.

- Ethnographic Research is when the researcher interacts with the participants of the study in their real life environment to understand their culture.
- Case Study method involves the close observation and detailed study of a specific unit such as a person, group, or event.
- Grounded Theory is when you assemble a theory based on collected data
- Phenomenological method is when you study the participants' past experiences in order to investigate an event
- Narrative method is using the experiences of subjects in order to understand how events are perceived.
- Historical method is taking past events to understand the present pattern, and so you can more accurately predict a future outcome.

3. [5 marks] What are the different types of quantitative research? In your own words, define and give an example for each.

- Descriptive Research is getting a summary for all the variables in your study.
- Correlation Research is when you investigate the relationships for your study variables.
- Experimental Research is finding out whether there's a cause and effect relationship between study variables.

4. [5 marks] What are the different types of sampling? In your own words, define and give an example for each.

- Simple random sampling is when every member of the population has the same chance at being selected. You can find simple random sample using a random number generator.
- Systematic sampling is similar to simple random sampling, except there's a fixed pattern used in selecting members of the population. For example, selecting only every other participant in the population.
- Stratified sampling is when you divide the sample population into subgroups that differ in certain characteristics. For example, dividing the population into "below 18" and "18 and above," and then taking a sample from each group.
- Cluster sampling is similar to stratified sampling, except instead of sampling from each subgroup, you sample entire subgroups instead. So if there were subgroups based on various salary ranges, you would randomly select a sample of the groups entirely.

5. [5 marks] What are the different levels of measurement? In your own words, define and give examples for each. Also state which is the most and least complex level of measurement.

- Nominal measurement is data that is divided and labeled in categories that cannot be ordered in any significant way

- Ordinal measurement is data that is divided and labeled in categories that can also be ranked in order.
- Interval measurement is data that is measured along a numerical scale that has equal distances between adjacent values
- Ratio measurement is similar to interval measurement, but also has a true zero.

6. [5 marks] What are the different measures of central tendency and variability?
What does these two measures tell you about the dataset?
   - The 3 central tendencies are mean, median and mode. These help you find the middle or average of a dataset.
   - Variability measurements include Range, Interquartile range, Standard deviation and variance. These describe how far apart data points lie from each other and the center of distribution.

7. [10 marks] Given the set of test scores for a final exam: 93, 82, 76, 41, 53, 90,
88, 41, 94. Find the (i) mean (ii) median, and (iii) mode test score for this set.
   - Mean: (93+82+76+41+53+90+88+41+94) / 9 = 73.1111
   - Median: 41, 41, 53, 76, **82**, 88, 90, 93, 94. 82 is the median.
   - Mode: 41 is the mode since it's seen twice.

8. [10 marks] Calculate the variance and standard deviation of the following sample:
2, 3, 6, 6, 8.
   1. (2+3+6+6+8) / 5 = 5
   2. 2-5, 3-5, 6-5, 6-5, 8-5
   3. -3, -2, 1, 1, 3
   4. After squaring each: 9, 4, 1, 1, 9
   5. Variance: (9+4+1+1+9) / 5 = **4.8**
   6. Standard deviation: sqrt(4.8) = **2.19**