SECTION 2

Q12. Explain the difference between Correlation and Causation with an example.

1) Causation means that one variable directly influences or causes a change in another variable.
   Wealthy countries have higher chance of getting nobel prizes
2) Correlation refers to a statistical relationship between two variables. When two variables are correlated, they tend to change together.
   Nobel prize is won by countries who eat more chocolate

Q13.Why do we need sampling? Provide a real-world example.

We need sampling because it lets us to draw meaningful conclusions about a population without the need to study every individual. It saves time, reduces costs.
Eg. taking the data of people who like chocolate ice cream India.

Q14. Define Null Hypothesis, Alternate Hypothesis, Significance Level (α), and P-value.

Null hypothesis

The null hypothesis is a statement that there is no effect or no difference between groups or variables. It represents the default or status quo assumption.

Alternate hypothesis

The alternate hypothesis is a statement that contradicts the null hypothesis. It represents the research question or the effect you are testing for.

Significance Level

The significance level is the probability threshold used to determine whether to reject the null hypothesis. It represents the risk of rejecting the null hypothesis when it is actually true.

P value

The p-value is the probability of obtaining the observed data if the null hypothesis is true

Q15. Given a sample mean of 25, population mean of 22, population standard deviation of 3, and sample size of 40, compute the Z-test statistic and interpret the results.

Z= 6.324
P= 0.00001
result= not significant

Q16.Using a standard normal table, find the p-value corresponding to the Z-test statistic computed in the previous question and determine whether to reject the null hypothesis at α = 0.05.

P=0.00001
No need to reject hypothesis