Statistics Terminology & Jargon – PDF Notes

1. Basic Concepts

- Population – Entire group under study.
- Sample – Subset of population.
- Parameter – Numerical measure of population.
- Statistic – Numerical measure of sample.
- Discrete Variable – Countable values.
- Continuous Variable – Infinite possible values.

2. Central Tendency

- Mean – Average value.
- Median – Middle value.
- Mode – Most frequent value.

3. Dispersion

- Range – Max minus Min.
- Variance – Average squared deviation.
- Standard Deviation – Square root of variance.
- IQR – Q3 minus Q1.
- Coefficient of Variation – Std / Mean.

4. Probability

- Experiment – Random process.
- Sample Space – All possible outcomes.
- Event – Subset of sample space.
- Independent Events – No effect on each other.
- Dependent Events – One affects another.

5. Probability Distributions

- Random Variable – Depends on chance.
- PMF – For discrete distributions.
- PDF – For continuous distributions.
- CDF – $P(X \leq x)$.
- Bernoulli Distribution – Single trial.
- Binomial Distribution – n trials.
- Poisson Distribution – Event counts.
- Normal Distribution – Bell-shaped curve.
- Standard Normal – Mean 0, Std 1.
- Exponential Distribution – Time between events.

6. Sampling

- Random Sampling – Equal chance.
- Stratified Sampling – Group-wise sampling.
- Sampling Bias – Non-random selection.

7. Hypothesis Testing

- Null Hypothesis (H0) – No effect.
- Alternative Hypothesis (H1) – Effect exists.
- Significance Level (α) – Type I error rate.
- P-value – Probability if H0 is true.
- Type I Error – False Positive.
- Type II Error – False Negative.
- Power of Test – 1 minus Type II error.
- Confidence Interval – Range for parameter.

8. Correlation & Association

- Correlation – Strength of relationship.
- Pearson Correlation – Linear correlation.
- Spearman Correlation – Rank correlation.
- Covariance – Joint variability.
- Multicollinearity – High predictor correlation.

9. Statistical Tests

- Z-test – Large sample or known variance.
- T-test – Compare means.
- Chi-Square Test – Categorical association.
- ANOVA – Compare 3+ means.
- Mann-Whitney U – Non-parametric t-test.
- Kruskal-Wallis – Non-parametric ANOVA.

10. Regression & Distribution Shape

- Residual – Actual minus Predicted.
- R^2 – Variance explained.
- Adjusted R^2 – R^2 with penalty.
- Homoscedasticity – Constant variance.
- Heteroscedasticity – Non-constant variance.
- Outlier – Extreme value.
- Skewness – Asymmetry.
- Kurtosis – Tailedness.

11. Core Statistical Laws

- Central Limit Theorem – Sampling mean becomes normal.
- Law of Large Numbers – Sample mean approaches population mean.
- A/B Testing – Statistical comparison of two versions.