

UNIT-III: Tests of Hypotheses (Large and Small Samples)

1. A statistical hypothesis is:

- A) A mathematical equation
- B) A statement about a population parameter
- C) A sample observation
- D) A graph

Answer: B

2. The null hypothesis is denoted by:

- A) H_1
- B) H_2
- C) H_0
- D) H

Answer: C

3. The alternative hypothesis is represented by:

- A) H_0
- B) H_1
- C) α
- D) β

Answer: B

4. The level of significance is usually denoted by:

- A) β
- B) σ
- C) μ
- D) α

Answer: D

5. A Type I error occurs when:

- A) Accepting a false H_0
- B) Rejecting a true H_0**
- C) Rejecting a false H_0
- D) None of these

Answer: B

6. A Type II error occurs when:

- A) Rejecting a true H_0
- B) Accepting a false H_0
- C) Rejecting a false H_0
- D) None

Answer: B

7. The Z-test is generally used for:

- A) Small samples only
- B) Large samples
- C) Qualitative data
- D) Frequency tables

Answer: B

8. Student's t-test is used when:

- A) Sample size is large
- B) Population variance is known
- C) Sample size is small and population variance is unknown
- D) None

Answer: C

9. For testing a single population mean with large samples, we use:

- A) t-test
- B) χ^2 -test
- C) **Z-test**
- D) F-test

Answer: C

10. Two-sample t-test assumes:

- A) Population variances are unequal
- B) Population variances are equal but unknown
- C) Population means are equal
- D) Sample sizes must be large

Answer: B

11. The F-test is mainly used to compare:

- A) Means
- B) Medians
- C) **Variances**
- D) Proportions

Answer: C

12. The F-statistic is calculated as:

- A) $\text{Mean}_1/\text{Mean}_2$
- B) $\text{Variance}_1/\text{Variance}_2$
- C) SD_1/SD_2
- D) n_1/n_2

Answer: B

13. A test concerning a single proportion uses:

- A) t-test
- B) F-test
- C) χ^2 -test
- D) **Z-test**

Answer: D

14. The standard normal distribution has mean:

- A) 1
- B) **0**
- C) 5
- D) -1

Answer: B

15. Which test is used for comparing two proportions?

- A) t-test
- B) **Z-test**
- C) F-test
- D) χ^2 -test

Answer: B

16. The critical region is also called:

- A) Acceptance region
- B) Rejection region
- C) Confidence region
- D) Sample region

Answer: B

17. If calculated test statistic is greater than the critical value:

- A) Accept H_0
- B) Reject H_0
- C) Increase sample size
- D) None

Answer: B

18. Degrees of freedom in a one-sample t-test are:

- A) n
- B) $n+1$
- C) $n-1$
- D) $n-2$

Answer: C

19. Which distribution is used for variance testing?

- A) Z
- B) t
- C) χ^2
- D) F

Answer: D

20. The probability of Type I error equals:

- A) β
- B) α
- C) $1-\alpha$
- D) $1-\beta$

Answer: B

Fill in the Blanks

1. A statement about a population parameter is called a **statistical hypothesis**.
2. The null hypothesis is denoted by **H_0** .
3. The alternative hypothesis is represented by **H_1** .
4. The probability of Type I error is called the **level of significance**.
5. The symbol for level of significance is **α** .
6. Rejecting a true null hypothesis is called **Type I error**.
7. Accepting a false null hypothesis is called **Type II error**.
8. The **Z-test** is generally used for **large samples**.
9. The **t-test** is used for small samples.
10. The **F-test** is used for comparing two variances.
11. The ratio of two sample variances follows the **F-distribution**.
12. The standard normal distribution has **mean 0**.
13. The standard normal distribution has standard deviation **1**.
14. For testing a single population proportion, the **Z-test** is commonly used.

15. In a one-sample t-test, degrees of freedom are $n-1$.
16. The rejection region is also called the critical region.
17. If the calculated value exceeds the table value, H_0 is rejected.
18. The two-sample t-test assumes equal population variances.
19. The sample variance is denoted by s^2 .
20. The decision to reject or accept H_0 depends on the test statistic and critical value.