CUET (UG) – MATHEMATICS

Chapter Test - Section B2: Applied Mathematics - Unit VI: Inferential Statistics

General Instructions

1. Total Questions: **20**
2. Duration: **60 Minutes**
3. All questions are compulsory.
4. Each question carries **5 marks**.
5. For each correct answer: **+5 marks**.
6. For each incorrect answer: **-1 mark**.
7. No negative marking for unanswered questions.
8. Use of calculator or electronic devices is strictly prohibited.
9. Choose the most appropriate answer from the given options.

1. A numerical value used as a summary measure for a sample, such as sample mean, is known as a:
   (A) Parameter
   (B) Population mean
   (C) Statistic
   (D) Census

2. According to the Central Limit Theorem, the sampling distribution of the sample mean will be approximately normal if:
   (A) The population is normal
   (B) The sample size n is large (typically $n \geq 30$)
   (C) The population standard deviation is known
   (D) All of the above

3. In a t-test, the "degrees of freedom" for a single sample of size n is calculated as:
   (A) n
   (B) $n + 1$
   (C) $n - 1$
   (D) $2n - 1$

4. The t-distribution is most commonly used when the sample size is small and the:
   (A) Population variance is known
   (B) Population variance is unknown
   (C) Population is not normal
   (D) Population mean is zero

5. A researcher wants to compare the mean scores of two independent groups. Group 1 has 10 students and Group 2 has 12 students. The degrees of freedom for this two-sample t-test is:
   (A) 22
   (B) 21
   (C) 20
   (D) 11

6. If the population mean is μ and the population standard deviation is σ, the standard error of the mean for a sample of size n is:
   (A) σ/n
   (B) $\sigma/\sqrt{n}$
   (C) σ^2/n
   (D) $\sqrt{\sigma/n}$

7. In testing the hypothesis $H_0 : \mu = 50$ against $H_a : \mu \neq 50$, the test is:
   (A) Left-tailed
   (B) Right-tailed
   (C) Two-tailed
   (D) Non-parametric

8. The t-distribution curve is:
   (A) Skewed to the right
   (B) Skewed to the left
   (C) Bell-shaped and symmetric about zero
   (D) U-shaped

9. As the degrees of freedom increase, the t-distribution approaches the:
   (A) Binomial distribution

(B) Poisson distribution
(C) Standard normal distribution
(D) Uniform distribution

10. A sample of 16 items gives a mean of 42. If the population is normal with unknown variance, and we calculate $t = 2.0$, what is the estimated population mean if the sample standard deviation is 4?
(A) 40
(B) 44
(C) 42
(D) 38

11. The difference between a parameter and a statistic is called:
(A) Standard error
(B) Sampling error
(C) Probability
(D) Hypothesis

12. For a two-sample t-test, the null hypothesis usually states that:
(A) The means of the two populations are different
(B) The means of the two populations are equal
(C) The variance of the sample is zero
(D) The sample size is large

13. If the calculated t-value is greater than the critical t-value at a given level of significance, we:
(A) Accept the null hypothesis
(B) Reject the null hypothesis
(C) Change the sample size
(D) Conclude that the test is invalid

14. A random sample of size $n = 25$ is taken from a population with mean $\mu = 100$ and variance $\sigma^2 = 400$. The mean of the sampling distribution of means is:
(A) 4
(B) 20
(C) 100
(D) 16

15. In a one-sample t-test, the t-statistic is calculated as:
(A) $(\bar{x} - \mu)/(s/\sqrt{n})$
(B) $(\bar{x} - \mu)/s$
(C) $(\mu - \bar{x})/n$
(D) $(\bar{x} - s)/\mu$

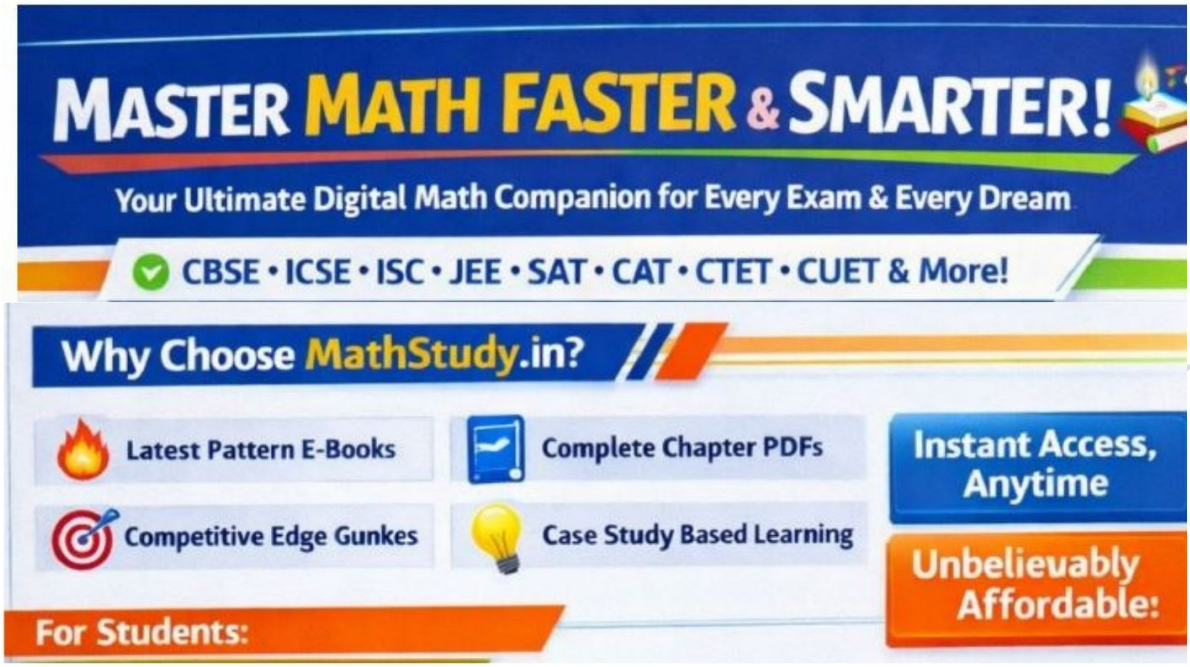
16. The Central Limit Theorem is fundamental in statistics because it allows us to:
(A) Use the normal distribution for inference even if the population is non-normal
(B) Calculate the exact value of the population mean
(C) Ignore the sample size
(D) Eliminate all sampling errors

17. Which of the following is an example of a parameter?
(A) Sample proportion
(B) Sample variance
(C) Population standard deviation
(D) Sample mean

18. If the level of significance is 0.05 for a two-tailed test, the area in each tail is:
    (A) 0.05
    (B) 0.025
    (C) 0.10
    (D) 0.01

19. When the sample size is very large ($n > 1000$), the difference between using a Z-test and a t-test is:
    (A) Extremely large
    (B) Significant
    (C) Negligible
    (D) Not measurable

20. In a t-test for two independent samples with equal variances, if $n_1 = 15$ and $n_2 = 15$, the degrees of freedom are:
    (A) 30
    (B) 29
    (C) 28
    (D) 14



Special Features

- **Board-Specific** – CBSE, ICSE, ISC, State Boards
- **Exam-Focused** – JEE, SAT, CAT, CTET, CUET, NTSE
- **Grade-Wise** – Class 6 to 12
- **Bilingual Options** – English & Hindi Medium Support
- **Printable & Shareable** – Use offline, anytime

How to Order:

Visit : https://www.mathstudy.in
Browse by Exam, Class, or Topic
Add to Cart & Checkout

Contact & Support:

Email: admin@mathstudy.in
WhatsApp Support Available : +91-+91 92118 65759

Why Wait? Empower your learning journey, save time, and achieve your dreams!

Explore & Start Learning Today:
https://www.mathstudy.in – Premium eBooks for success
https://www.udgamwelfarefoundation.com – Free PDFs, practice tests, & guida

MathStudy.in — Empowering Learners, Enabling Educators, Encouraging Excellence.
Digital Learning | Affordable Excellence | Trusted by Thousands