

**THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2023****(Regular/Improvement/Supplementary)****PSYCHOLOGY****GPSY3C06T: PROBABILITY DISTRIBUTIONS AND PARAMETRIC TESTS****Time: 2 Hours****Maximum Marks: 60****SECTION A: Answer the following questions. Each carries *two* marks.****(Ceiling 20 Marks)**

1. Define Type-II error.
2. Define convenience sampling with the help of an example.
3. What are the assumptions about t-test for the population mean?
4. Define judgment sampling.
5. Define Normal distribution.
6. Write down the test statistic for testing the equality of proportions when the sample sizes are large.
7. A survey of 100 similar-sized hospitals revealed a mean daily census in the pediatrics service of 27 with a standard deviation of 6.5. Do these data provide sufficient evidence to indicate that the population mean is greater than 25? Let  $\alpha=0.05$ .
8. What do you mean by sampling frame?
9. State Central Limit Theorem.
10. What is meant by critical region?
11. Write a short note on simple random sampling.
12. Define Bernoulli distribution.

**SECTION B: Answer the following questions. Each carries *five* marks.****(Ceiling 30 Marks)**

13. Explain the advantages and disadvantages of sampling.
14. a) Explain null and alternative hypothesis with suitable examples.  
b) Distinguish between one tailed and two tailed tests.
15. Give the procedures for testing the large sample test for the equality of two normal population means.

**(PTO)**

16. Tests were carried out to assess the strength of single fiber yarn spun on two different machines A and B and the results are given below:

Machine A	4	4.4	3.9	3	4.2	4.4	5
Machine B	5.3	4.3	4.1	4.4	5.3	4.2	3.8

Assuming the samples have been taken from normal population, test the hypothesis that variability is same for both the machines.

17. a) Define Poisson distribution. Give three examples familiar to you, the distribution of which will conform to the Poisson form.
- b) A telephone exchange receives on an average 4 calls per minute. Find the probability on the basis of Poisson distribution of:
- 2 or less calls per minutes.
  - More than 4 calls per minute.
18. Describe the following concepts:
- Level of significance.
  - Power of a test.
  - P-value.
  - Parametric and non-parametric hypothesis.
19. What do you understand by stratified random sampling? Discuss its merits and demerits.

**SECTION C: Answer any *one* question. Each carries *ten* marks.**

20. Describe :
- Test of significance for equality of two population variances.
  - The Chi-square test for population variance.
21. a) Describe the binomial distribution. Give some practical situations in which binomial distribution is applicable.
- b) Suppose the average length of stay of a certain type of patients in a hospital with chronic disease is 50 days with a standard deviation of 10. If it is reasonable to assume an approximately normal distribution of lengths of stay, find the probability that a randomly selected patient from this group will have a length of stay:
- Greater than 40 days
  - Less than 25 days
  - Between 45 and 60 days
  - Greater than 80 days

**(1 x 10 = 10 Marks)**

