D 14420 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER INTEGRATED P.G. REGULAR EXAMINATION NOVEMBER 2021 (FOR 2020 ADMISSIONS) AND NOVEMBER 2022 (FOR 2021 ADMISSIONS)

M.Sc. Psychology

STA 3I C02—PROBABILITY DISTRIBUTIONS AND PARAMETRIC TESTS

Time : Two Hours Maximum : 60 Marks

Use of calculator and Statistical table are permitted.

Part A (Short Answer Type Questions)

Each question carries 2 *marks.*
Maximum marks that can be scored from this part is 20.

1. Determine the binomial distribution if mean is 6 and variance is 2.
2. What are the main features of normal distribution ?
3. State central limit theorem.
4. If Z has a standard normal distribution find $P(-1 < Z < 3)$.
5. Distinguish between simple random sampling with replacement and without replacement.
6. Define stratified random sampling
7. Distinguish between linear and circular systematic sampling.
8. What is *p*-value ?
9. What are the two types of errors ?
10. What is level of significance ?
11. Write a short note on subjective sampling.
12. What is the test statistic for testing single mean when sample size is large and population variance is known ?

Turn over

Part B (Short Essay/Paragraph Type Questions)

Each question carries 5 *marks.*
Maximum marks that can be scored from this part is 30.

13. The random variable X following Poisson distribution with mean = 0.4. Find $P(X = 0)$ and $P(X = 1)$.

    Given that $e^{-0.4} = 0.6703$.

14. A random sample of 10 boys had the following IQ's :

    70, 120, 110, 101, 88, 83, 95, 98, 107, 100

    Do these data support the assumption of a population mean IQ of 100 ?

15. Describe the terms critical region and power of the test.

16. Define binomial distribution. Write down the mean and variance of binomial distribution.

17. Briefly explain cluster sampling.

18. Describe the test procedure for testing single mean in large sample case.

19. X is a normal variate with mean 30 and standard deviation 5. Find the probabilities that :

    (i) $26 \le X \le 40$; (ii) $X \ge 45$; and (iii) $|X - 30| \le 5$.

Part C (Essay Type Questions)

The question carries 10 *marks.*
Answer any **one** *question.*
Maximum marks that can be scored from this part is 10.

20. i) Explain the test procedure for paired *t*- test.

    ii) Explain chi square test of variance.

21. Two random samples gave the following results :

Sample	Size	Sample mean	Sum of squares of deviations from the mean
1	10	15	90
2	12	14	108

    i) Test the equality of population variances.

    ii) Test the equality of population means.