K21U 0234

Reg. No. : .....

Name : .....

III Semester B.Sc. Hon's (Mathematics) Degree (Reg./Supple./Improv.) Examination, November 2020
(2016 Admission Onwards)
BHM304 : THEORY OF SAMPLING AND ESTIMATION

Time : 3 Hours Max. Marks : 60

SECTION – A

Answer **any 4** questions out of **5** questions, **each** question carries **one** mark.

1. Define parameter and statistic.
2. Define consistency of an estimator.
3. Give the formula for F statistic.
4. Define standard error.
5. What is alternate hypothesis ? **(4×1=4)**

SECTION – B

Answer **any 6** questions out of **9** questions **each** carrying **2** marks.

6. Let X be distributed in the Poisson form with parameter θ. Show that only unbiased estimator of exp $\{-(k+1)\theta\}$, $k > 0$, is $T(X) = (-k)^X$.
7. Differentiate between point and interval estimation.
8. Define type 1 and type 2 errors.
9. Write properties of maximum likelihood estimators.
10. Describe confidence limit and confidence interval.

P.T.O.

11. What is probable error and give example ?

12. Define simple and composite hypothesis.

13. Find the maximum likelihood estimate of p for a binomial population with parameters (n,p).

14. Describe procedure for hypothesis testing. **(6×2=12)**

SECTION – C

Answer **any 8** questions out of **12**.

15. Define consistency of a sample and state invariance property of consistent estimator.

16. Explain stratified sampling in detail with example.

17. "In every hypothesis testing, the two types errors are always present", if this is true then explain what is the use of hypothesis testing.

18. Explain Bayesion estimation.

19. Describe level of significance of large samples.

20. A random sample of 500 apples was taken from a large consignment and 60 were found to be bad. Obtain the 98% confidence limits for the percentage of bad apples in the consignment.

21. Define critical values and significant values.

22. Explain the large sample test for testing equality of proportions.

23. Define stratified and purposive random sampling.

24. State Neyman person lemma.

25. Explain the term efficiency and also show that for normal distribution sample mean the more efficient estimator than sample median.

26. Write the test procedure for testing the significance for single mean. **(8×4=32)**

SECTION – D

Answer **any 2** questions out of **4**.

27. State and prove central limit theorem.

28. Explain each type of sampling :
    1) Purposive sampling
    2) Random sampling
    3) Stratified sampling
    4) Systematic sampling.

29. Write the procedure for testing the significance for difference of means of two large samples.

30. Explain each property of a good estimator and give example for each. **(2×6=12)**