B.A. (Honours) Examination, 2019
Semester–VI
Economics
Course – H-13
(Quantitative Methods-II)

Time: Three Hours **Full Marks: 40**

Questions are of value as indicated in the margin.

Answer ***anyfour***questions.

1. (a) What do you mean by 'Sampling fluctuations'? 2
   (b) Define Chi-Square Variable. 2
   (c) Write the probability density function of the Chi-Square distribution. 1
   (d) State the properties of Chi-Square distribution. 5
2. (a) Distinguish between simple random sampling with replacement and simple random sampling without replacement. 5
   (b) State the Central Limit Theorem. 3
   (c) What do you mean by percentage point of the distribution? 2
3. Given an outline of the NeymanPearson theory of testing hypothesis, explaining the concepts of type I and Type II error, power of a test, most powerful test and uniformly mostpowerful test. 10
4. In the context of CLRM (2 variables case)
   (a) Show Total Sum of Square is the sum of explained sum of square and residual sum of squares.
   (b) State and prove the Gauss-Marker Theorem. 4+6
5. (a) Considering some iid observations based on a sample from N (μ, σ^2), where μ and σ^2 are both unknown, find the maximum likelihood estimators of population mean μ and population variance σ^2.
   (b) If T_1 and T_2 be statistics with expectation $E(T_1) = 2\theta_1 + 3\theta_2$and $E(T_2) = \theta_1 + \theta_2$, find the unbiased estimator of parameters θ_1 and θ_2. 7+3
6. (a) State and explain the important uses of the student's t distribution in sampling theory.
   (b) The standard deviations calculated from two random sample of sizes 9 and 13 are 2.1 and 1.8 respectively can the samples be regarded as drawn from normal populations with same standard deviation? (The 5% value of F from table with degrees of freedom 8 and 12 is $F_{0.05}$=2.85). 5+5

P.T.O.

7. (a) Show that sampling from a Normal population $N(\mu, \sigma^2)$ the sample mean is MVUE for parameter μ.

   (b) State the Cramer-Rao inequality. 7+3

8. Write short note of the following:

   (a) F Distribution.

   (b) Methodology of Econometrics. 5+5
