9. Give in detail the analysis of variance for two way classification with one observation per cell.

ØelÙekeâ keâe%ekeâ ce Skeâ Øe#eCe Jeeue eÉOee Jeieekeâle Deekeâ[e nle Øeme jCe eJeMue<eCe keâe JÙeeKÙee keâeepeÙe~

A (Printed Pages 8)

Roll No. ____________

S-695

B.A. (Part-II) Examination, 2015

STATISTICAL INFERENCE & ANALYSIS OF VARIANCE

First Paper

Time Allowed : Three Hours] ***[Maximum Marks : 33***

Note : Answer Question No. 1 and four other questions, selecting one question from each unit.

ØeMve me. 1 leLee ØelÙekeâ FkeâeF me Skeâ ØeMve Ûevele nS, Üeej DevÙe ØeMvee keâ Gòej oeepeS~

1. (a) What do you understand by an estimator? Give an example.

Deekeâueekeâ me Deehe keÙee mecePele n? Skeâ Goenj Ce oeepeÙe~

(b) Show that unbiasedness of an estimator T for θ does not imply that T^2 will also be unbiased estimator of θ^2.

eoKæFÙe ekeâ θ keâ Deekeâuekeâ T keâe DeveeYevelee Ùen Devleeo ° vene keâjlee n ekeâ T^2 Yee θ^2 keâe DeveeYevele Deekeâuekeâ neiee~

(c) Define sufficiency of a statistic with an example.

ØeeleoMepe keâe heÙeehlelee keâe heejYee<ee GoenjCe meenle oeepeÙe~

(d) Explain simple and composite hypothesis with an example.

meeOeejCe leLee meÙeòeâ heejkeâuheveeDee keâe Goenjce meenle mecePeeFÙe~

(e) Explain critical region in testing of hypothesis.

heejkeâuhevee hejer#eCe ce ›eâeeleekeâ #e$e keâe eeFÙe~

7. (a) Explain the problem of Interval estimation. How does it differ from the Point estimation?

Devlejeue Deekeâueve keâe mecemÙee keâe mecePeeFÙe~ Ùen ekeâme lejn eyevo Deekeâueve me eYeVe n?

(b) Derive the likelihood ratio test for testing whether the correlation of a binariate normal distribution is zero.

ekeâmee eÉÛej ØemeeceevÙe mecee ° ce menmecyevOe MevÙe neve keâe heejkeâuhevee keâe hejee#ele keâjve nle Skeâ meYeeeJelee Deveheele hejer#eCe eueeKeÙe~

Unit - IV

FkeâeF - IV

8. What is analysis of variance? Discuss the model and analysis for one-way classification.

ØemejCe eJeMue<eCe me keÙee leelheÙe n? Skeâ0ee eekeâjCe keâ Øeele¤he Deej eJeMue<eCe keâe mecePeeFÙe~

Unit - I

FkeâeF - I

2. Describe the method of moments of estimation and state the properties of these estimators. Find out the estimator of μ and σ^2 in a random sampling from a population $N(\mu,\sigma^2)$ by the method of moments.

Deekeâuekeâ keâe DeelеCe eJeeOe keâe JeCeve keâeepeÙe leLee Fme Deekeâuekeâ keâe ieCeOece yeleeFÙe~ $N(\mu,\sigma^2)$ mecee° me Øeehle ÙeeÂeÛÚkeâ ØeeleoMe Éeje μ Je σ^2 keâ Deekeâuekeâ DeeleCe eJeeOe Éeje %eele keâeepeÙe~

3. What do you understand by consistency? State the sufficient condition of consistency. Show that for a random sample from Cauchy population with density function.

$$f(x,\mu) = \frac{1}{\pi\,[1+(x-\mu)^2]}, \quad -\infty < x < \infty$$

the sample median is a consisten estimator for μ.

meielelee me Deehe keÙee mecePele n? meielelee keâe heÙeehle ØeeleyevOe keÙee n? eoKeeFÙe ekeâ :

$$f(x,\mu) = \frac{1}{\pi\,[1+(x-\mu)^2]}, \quad -\infty < x < \infty$$

me eueÙe ieÙe ÙeeÂeÛÚkeâ ØeeleoMe keâe ØeeleoMe ceeeOÙekeâe μ keâe meiele Deekeâuekeâ n~

Unit - II

FkeâeF - II

4. State and prove Cramer-Rao inequality. Using it determine minimum variance unbiased estimation θ, in $N(0,\theta)$. Also find Cramer-Rao lower bound of variance of estimate of θ.

›eâcej-jeJe Demeecekeâe keâe eueeKeÙe leLee emeæ keâeepeÙe~ Fmekeâe ØeÙeeie keâjle nS $N(0, \theta)$ yešve keâ eueÙe θ keâe vÙevelece ØemejCe DeveeYevele Deekeâuekeâ %eele keâeepeÙe~ θ keâ Deekeâuekeâ keâ ØemejCe keâe ›eâcej-jeJe vÙevelece meecee Yee %eele keâeepeÙe~

5. Define most powerful (MP), uniformly most powerful (UMP) and uniformly most powerful

unbiased (UMPU) tests with suitable examples.

meJeeòece (MP) meceeve¤hee meJeeòece (UMP) leLee meceeve¤hee meJeeòece DeveeYevele (UMPU) hejer#eCee keâe heejYee<eeS GheÙeòeâ GoenjCe meenle oeepeÙe~

Unit - III

FkeâeF - III

6. State and prove Neyman-Pearson Lemma. Use it to obtain the best test for $H_0 : \mu=\mu_0$ on the basis of a random sample of size n drawn from a normal population $N(\mu,1)$ against the alternative hypothesis $H_1 : \mu=\mu_1$ when (i) $\mu_1 > \mu_0$, (ii) $\mu_1 < \mu_0$

veceve-eheÙemeve ØeceeÙekeâe keâe eueeKeÙe leLee emeæ keâeepeÙe~ Fmekeâe ØeÙeeie keâjkeâ Øemeeceevùe mecee° $N(\mu,1)$ GheueyOe n heejceeCe keâ ÙeeeÂeÛÚkeâ Øeeleoe Me hej DeeOeeejle MevÙe heejkeâuhevee $H_0 : \mu=\mu_0$ keâ meehe#e eJekeâuhe heejkeâuhevee $H_1 : \mu=\mu_1$ keâ eueÙe meJeeòece hej e#eCe Øeehle keâeepeÙe peyeekeâ (i) $\mu_1 > \mu_0$, (ii) $\mu_1 < \mu_0$ ne~

(f) What are the type I and type II errors in testing of hypothesis?

heejkeâuhevee hej e#eCe ce ØeLece Øekeâej leLee eÉleeÙe Øekeâej keâe $eešÙee keÙee n?

(g) Write the concept of best confidence intervals.

meJeeÛÛe eJeMJeeme Devlejeue keâe veeele keâe eueeKeÙe~

(h) State two applications of t-distribution.

t-yešve keâ oe GheÙeeiee keâe eueeKeÙe~

(i) In what way analysis of covariance differ from analysis of variance?

menØeme jCe eJeMue<eCe, Øeme jCe eJeMue<eCe me ekeâme Øekeâej eYeVe n?

(j) What are underlying assumptions of the analysis of variance?

Øeme jCe eJeMue<eCe keâe eveenle keâuheveeS keÙee n?