

(4)

(g) What is rank correlation? Give its limits.

केस में मर्यादित की जा सकती है। इसके सीमाएं बताएं-

(h) If  $b_{yx} = -0.9$  and  $b_{xy} = -1.5$ , whether this statement is true or not? Give reasons.

$b_{yx} = -0.9$  तथा  $b_{xy} = -1.5$  का कथन सत्य है या नहीं। इसके कारण बताएं।

(i) What do you mean by dispersion? How is it measured?

विक्षेपण क्या है? इसे कैसे मापा जाता है?

(j) What will be the number of ultimate class frequencies for  $n$  attributes?

$n$  विशेषताओं के लिए अंतिम वर्ग आवृत्तियों की संख्या क्या होगी?

Unit-I

Section-I

2. (a) Prove that the mean deviation when taken about median is least.

मध्यिका के लिए माध्य विचलन न्यूनतम होता है। इसे सिद्ध करें।

S-702

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(Printed Pages 8)

Roll No. \_\_\_\_\_

S-702

B.Sc. (Part-I) Examination, 2015

MATHEMATICAL STATISTICS

Third Paper

(Statistical Method)

*Time Allowed : Three Hours ] [ Maximum Marks : 50*

Note : Answer five questions in all, selecting one question from each unit and Question No. 1, which is compulsory.

सभी प्रश्नों के उत्तर दें, प्रत्येक इकाई से एक प्रश्न चुनें। प्रश्न संख्या 1 अनिवार्य है।

1. (a) Formula for coefficient of variation is :

विक्षेपण गुणांक का सूत्र है :

(i)  $C.V. = \frac{S.D.}{Mean} \times 100$

(ii)  $C.V. = \frac{Mean}{S.D.} \times 100$

(iii)  $C.V. = \frac{Mean \times S.D.}{100}$

(iv)  $C.V. = \frac{100}{Mean \times S.D.}$

P.T.O.

(2)

(b) If the coefficient of Kurtosis  $\gamma_2$  of a distribution is zero, the frequency curve is :

Ùeeb Skeá eleej Ce keáe keegolee iegcekeá ( $\gamma_2$ ) MevÙe nw lee yeej cyeej lee Jeeá neisee :

(i) Leptokurtic

uehŠkeáeŠkeá

(ii) Mesokurtic

cemeekeáeŠkeá

(iii) Platykurtic

hu eškeáeŠkeá

(iv) None of the above

GheÙeeá cellmes keáeŠ & veneR

(c) The mean age of 50 persons was found to be 32 years. Later it was found that age 57 was misread as 27, age 60 was misread as 35 and age 28 was misread as 33. Find the corrected mean age.

50 JÙeebeáÙeeÙkeáe Deemele DeeÙeg 32 Je-e&nw yeeo cellwheÙee ieÙee ekeá Gcei 57 keáe ŠegŠeÙe 27, 60 keáe ŠegŠeÙe 35 Šeb 28 keáe ŠegŠeÙe 33 heÙe eÙee ieÙee Lee- merner Deemele DeeÙeg ðeeÙe keáeŠeS-

(3)

(d) In case of a positive skewed distribution on the relation between mean, median and mode that holds is :

mekeáejelcekeá eÙe-ee eleej Ce keá eÙeŠ ceoÙee, ceoÙeekeá Deej yengrekeá cellmecehele mecyevOe nw:

(i)  $Md > M > Mo$

(ii)  $M > Md > Mo$

(iii)  $M = Md = Mo$

(iv) None of the above

GheÙeeá cellmes keáeŠ & veneR

(e) Write the range of multiple correlation coefficient.

yengcyevOe iegcekeá keá ceve keáe hejeme eÙeeŠeS-

(f) If A and B are positively associated, then :

Ùeeb A Deej B cellmekeáejelcekeá nwÙeeS :

(i)  $(AB) > \frac{(A)(B)}{N}$

(ii)  $(AB) < \frac{(A)(B)}{N}$

(iii)  $(AB) = \frac{(A)(B)}{N}$

(iv) None of the above

GheÙeeá cellmes keáeŠ & veneR

(8)

$$1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

keasS menmejeDe kear heej Yee-ee oap eS- oMeef Ues eka keasS  
menmejeDe ieqceka kea ceve :

$$1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

n#

Unit-IV

FkaeF-IV

8. What is Yule's co-efficient of association? Obtain its limits and find its relation with coefficient of colligation.

Ueue kea meenUeUe ieqceka kelee n# Fmekear mececeSB efrekaeeUeS  
leLee keaereieUe kea ieqceka kea meele Fmekeae mecyevDe %eele  
keaepeS-

9. Show that in a 2x2 Contingency table :

ebKeeFS eka ekaameer 2x2 Deemepve leedrekae :

the value of  $\chi^2$  is

a	b
c	d

ka eueS  $\chi^2$  kea ceve netee n#:

$$\chi^2 = \frac{(a+b+c+d)(ad-bc)^2}{(a+b)(b+d)(a+c)(c+d)}$$

(5)

(b) What is geometric mean? What are its merits and demerits?

ieqceej ceou kelee n# Fmeke kelee ieqe SJobDeleieqe n#

3. (a) Show that if the deviations  $x_i$  are small

compared with mean M so that  $\left(\frac{x_i}{M}\right)^3$  and

higher powers of  $\left(\frac{x_i}{M}\right)$  may be neglected

$$H = M \left[ 1 - \frac{\sigma^2}{M^2} \right]$$

where  $x_i = X_i - M$ , H is harmonic mean and  $\sigma^2$  is the variance of the variable x.

Ueeb eueveve  $x_i$  ceou M kear legvee ceUeS n#leedrekae

$\left(\frac{x_i}{M}\right)^3$  Deej  $\left(\frac{x_i}{M}\right)$  kear TBeer leelWeieCue n#leesebKeeFS

ekeá :

$$H = M \left[ 1 - \frac{\sigma^2}{M^2} \right]$$

peneb eka  $x_i = X_i - M$ , H njelekeá ceou leLee  $\sigma^2$

Deiej Ce n#

(6)

(b) Show that for any discrete distribution, the root mean square deviation about mean is least.

efo KeeFÜes ekeä ekeameer Demetele yeSve keä eueS eue ceeÜÜe Jie&eÜeueve, ceeÜÜe keä eueS vÜeuece nece nw

Unit-II  
FkeäF-I I

4. (a) Show that :

efo KeeFÜes ekeä :

$$\beta_2 \geq 1$$

What do you mean by dispersion. Discuss various measures of dispersion.

efemlej Ce mes Deche keÜe mecePeles nP efemlej Ce keä efceYeve ceeveel/keä Jecete keäcpeS~

(b) Derive first four central moments, in terms of moments about any point.

ÜeLece Üeej keävÖeÜe DeeteCeeX keä ceeve ekeameer efjevog me DeeteCeeX keä heoellcclWJÜeöä keäcpeS~

5. Explain the method of least squares. Derive the normal equation for fitting the curve of the type  $y = a + bx + cx^2$ .

Jecä Deempeve cellvÜeuece Jie&efmeæevle keäs eeFS leLee Jecä

(7)

$y = a + bx + cx^2$  keä Deempeve cellvÜeuece mecekeaj Ce Üeehle keäcpeS~

Unit-III  
FkeäF-III

6. (a) Explain the following :

(i) Multiple correlation coefficient.

(ii) Partial correlation coefficient.

efecveüeeKele keäs mecePeFS :

(i) yeng menmepeÜe iegcekeä

(ii) Deemkeä menmepeÜe iegcekeä

(b) Show that the correlation coefficient is independent of a change of origin of the variables.

oMeeFÜes ekeä menmepeÜe iegcekeä Üej ellkeä cete keä heej Jetele mes mJetele nw

7. (a) If  $R_{1.23} = 0$ , show that  $R_{2.13}$  is not necessarily zero.

Üeeb  $R_{1.23} = 0$ , efmeæ keäcpeS ekeä  $R_{2.13}$  keä MetÜe nece DeejellÜekeä veneR nw

(b) Define rank correlation. Show that the value of rank correlation coefficient is :