(i) Printed Pages : 4 Roll No. .....

(ii) Questions : 9 Sub. Code : 0 6 6 8

Exam. Code : 0 0 0 8

B.A./B.Sc. (Hons.) 4th Semester

(2053)

ECONOMICS

Paper : III Theory of Statistics

Time Allowed : Three Hours] [Maximum Marks : 90

Note :—Attempt any **NINE** short answer questions out of 1st question of **2** marks each. Attempt any **ONE** question from each unit of **18** marks each.

I. Attempt any **NINE** questions :—

(a) Differentiate between partial and multiple correlation coefficients.

(b) What is characteristic function ?

(c) What are continuous variables ?

(d) Differentiate between Random variable and variable.

(e) Define Geometric growth curve.

(f) What are mutually exclusive events ?

(g) What is probability density function ?

(h) What is Chebychev's inequality ?

(i) What are maximum likelyhood estimates ?

(j) What is statistical quality control ?

(k) Differentiate between one way and two way ANOVA.

(l) Differentiate between large sample and small sample tests. 9×2=18

UNIT—I

II. What are growth curves ? Discuss the types of growth curves. Also explain the methods of estimation of different growth curves. 18

III. Find the multiple regression equation of X_1 on X_2 and X_3 from the data given below :

X_1 :	2	4	5	7	11	13
X_2 :	12	9	5	3	1	0
X_3 :	30	24	20	14	10	4

Estimate best value of X_1 when $X_2 = 4$ and $X_3 = 10$ and interpret your result. 18

UNIT—II

IV. (a) Three groups of children contain respectively 3 girls and 1 boy; 2 girls and 2 boys; 1 girl and 3 boys. One child is selected at random from each group. Show that the chance of three selected children consists of 1 girl and 2 boys is 13/32.

(b) A bag contains 8 red and 5 white balls. Two successive drawings of 3 balls are made such that (i) balls are replaced before second trial, (ii) the balls are not replaced before the second trial. Find the probability that the first drawing will give 3 white balls and the second 3 red balls. 9+9=18

V. Discuss the properties of Normal Distribution. The life-time in hours of a certain electrical equipment has the normal distribution with Mean = 80 and Standard Deviation = 16.

(i) What is the probability that the equipment lasts at least 100 hours ?

(ii) If the equipment has already lasted 88 hours, what is conditional probability that it will last at least another 12 hours ? 18

UNIT—III

VI. (a) Differentiate between :

(i) Two tailed and One tailed tests

(ii) Type I and Type II errors.

(b) Discuss concepts of :

(i) Level of significance

(ii) Critical Region. 9+9=18

VII. Differentiate between Point estimation and Interval estimation. Also discuss properties of point estimates. 18

UNIT—IV

VIII. What are Non-parametric tests ? The following figures show the distribution of digits in numbers chosen at random from a telephone directory :

Digit	0	1	2	3	4	5	6	7	8	9	Total
Frequency	1026	1107	997	966	1075	933	1107	972	964	853	10000

Test whether the digits may be taken to occur equally frequently in the directory (χ^2 value for g.d.f. at 5% l.o.s. is 16.92)

18

IX. (a) Two random samples from two normal populations are drawn and following information is given :

Population	**Size of Sample**	**Sum of Observations**	**Sum of squares of observations**
I	8	9.6	61.52
II	11	16.5	73.26

You are to decide if the two populations can be taken to have same variance. What test function would you use ? How it is distributed and what value it has in this sampling experiment ?

(b) In district A, 450 persons were considered regular consumers of tea out of a sample of 1000 persons. In another district B, 400 were regular consumers of tea out of sample of 800 persons. Do these facts reveal a significant difference between the two districts as far as tea drinking habit is concerned ? Use 5% l.o.s.

9+9=18