

2/EH-28 (ii) (Syllabus-2015)

2 0 1 9

(April)

STATISTICS

(Elective/Honours)

**(Probability Distribution and Statistical
Inference)**

[STEH-2 (TH)]

Marks : 56

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

**Answer any five questions, taking one
from each Unit**

UNIT—I

- 1. Derive Poisson distribution as a limiting form of binomial distribution. Hence, find β_1 and β_2 of the distribution. (Notations have their usual meanings).**

12

- 2. (a) Obtain moment generating function of geometric distribution and hence obtain its mean and variance.**

6

(2)

- (b) Let X_1 and X_2 be independent r.v.s each having geometric distribution $q^k p$; $k = 0, 1, 2, \dots$. Obtain the conditional distribution of X_1 , given $X_1 + X_2$. 6

UNIT—II

3. (a) Obtain the mode, median and moment generating function of normal distribution. 9
(b) Write briefly the importance of normal distribution. 2
4. (a) Write the assumptions to derive bivariate normal distribution and also write its density function. 5
(b) Obtain the moment generating function of bivariate normal distribution. 6

UNIT—III

5. (a) What do you mean by sampling distribution and distribution of functions of random variables? 3
(b) What is chi-square variate? Show that the sum of independent chi-square variates is also chi-square variate. 4

D9/1602

(Continued)

(3)

- (c) Write a brief note on 'goodness of fit' and 'chi-square probability curve'. 4

6. Write notes on the following : $5\frac{1}{2} \times 2 = 11$

- (a) Weak law of large numbers and its applications
(b) Central limit theorem and its application

UNIT—IV

7. Define the following :

- (a) Likelihood function and method of maximum likelihood and its properties 5
(b) Method of moments 3
(c) Minimum variance unbiased estimation and its properties 3

8. (a) In random sampling from normal population $N(\mu, \sigma^2)$, find the maximum likelihood estimators for

- (i) μ when σ^2 is known ;
(ii) σ^2 when μ is known ;
(iii) the simultaneous estimations of μ and σ^2 6

D9/1602

(Turn Over)

- (b) Find the maximum likelihood estimate for the parameter λ of the Poisson distribution.

5

UNIT—V

9. (a) What is 'hypothesis testing'? What do you mean by one-tailed and two-tailed tests? 3
- (b) Write a note on p -values. 4
- (c) Write briefly the procedure for testing of hypothesis. 4
10. Write notes on Large sample tests for :
(a) single mean, (b) single proportion and
(c) difference of two means. Write their 95% confidence limits. 2+3+3+3=11
