[This question paper contains 4 printed pages.]

**Your Roll No.....**

**Sr. No. of Question Paper : 5807** **H**

Unique Paper Code : 237502

Name of the Paper : Applied Statistics III

Name of the Course : **B.Sc. (Hons.) Statistics**

Semester : V

Duration : 3 Hours Maximum Marks : 7

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt o this question paper.
2. Attempt **six** questions in all.
3. Use of simple calculator is allowed.

1. (a) Explain why the mortality situations of two places shoul not be compared on the basis of crude death rate. Wh are the standardised death rates better for the sa comparison? Describe the Indirect method standardising death rates.

(b) Define the term Vital Statistics and outline its uses.

(7½

2. (a) Discuss the procedure of converting a set of ratings judges, into scores.

(b) Define stable population and stationary population. Sh that

(i) $m_x = \frac{2q_x}{2-q_x}$

(ii) $\mu_x e_x^0 = 1 + \frac{de_x^0}{d_x}$ (5½

3. (a) Discuss the method of fitting of Makeham's graduati formula by Partial Sums.

(b) Define force of mortality. If $\mu_x = A + B.C^x$, find expression for $l_x$. (6,6

4. (a) The following values were obtained by administering 100 item geometrical drawing ability test to a group 250 students of a local technical school :

Mean score = 49.95

s.d = 12.53

Obtain an estimate of test reliability by Ruder Richards method.



(b) Explain briefly the concept of validity of scores in educational and psychological experiments. Discuss different types of validity. (5,7½)

5. (a) What is IMR? Why is it considered as the most sensitive index of health conditions?

(b) Define G.R.R and N.R.R. Assuming that sex ratio of birth remains constant at all ages of the women in reproductive period, find an approximate value of G.R.R. Also show that for any community, the N.R.R is necessarily less than the G.R.R. (4½,8)

6. (a) Write short notes on the following :

(i) Intelligence quotient

(ii) Speed and Power tests

(iii) Z (or σ) scores

(b) Derive the logistic equation starting from a suitable assumption regarding the relative growth rate of population. (6,6½)

7. (a) Define curate expectation of life .Given that the complete expectation of life at ages 30 and 31 for a particular group are respectively 21.39 and 20.91 years and that

the number living at age 30 is 41176. Find (i) the nu
that attains the age 31 and (ii) the number that wi
without attaining the age 31.

(b) Define a T-score. Describe how T- scores are
found given that test scores are in the form of freq
distribution.

8. (a) Show that the reliability of a test length k in ter
its reliability $\rho_{k'}$ at length k' is :

$$\rho_k = \frac{k\rho_{k'}}{k' + (k - k')\rho_{k'}}$$

(b) Distinguish between complete and abridged life ta
Explain how you would complete a life table give
death rate at each individual age.