M.Sc. Part–II Semester–III (CBCS) Examination
STATISTICS
BIOASSAY–I
Paper–XI

Time : Three Hours] [Maximum Marks : 80

N.B.:—Solve either **A** or **B** from each question.

1. (A) (a) Define :

(i) Direct assay

(ii) Indirect assay

(iii) Qualitative assay

(iv) Quantitative assay.

(b) Define ratio estimators used in bioassay ; also derive its variance. 8+8

OR

(B) (i) Explain assymetric Parallel line assay and various tests involved in it.

(ii) Explain the procedure for estimating relative potency in direct assay. 8+8

2. (A) (a) Define probit for the dose response relationship $Y = a + bx$. Obtain the estimate of median effective dose under this approach.

(b) Define logit. Discuss the logit approach when dose response curve is unknown for standard preparation. 8+8

OR

(B) (i) Obtain Relative Potency in Probit approach.

(ii) Define Quantal Response. Give comparison between logit and probit approach in quantal assay. 8+8

3. (A) (a) Describe Thomson's moving average method to estimate median effective dose in quantal assay.

(b) Describe Spearman Karber method to estimate median effective dose. 8+8

OR

(B) (i) Explain Dose allocation scheme in Bioassay. Define optimum sampling strategy.

(ii) Explain the method suggested by Muller and Schmitt for allocation of doses in bioassay. 8+8

4. (A) (a) Describe Dixon and Mood's sequential approximation method for estimating median effective dose.

(b) Define 'Safe dose'. State the problem of estimation of safe dose in quantal assay. 8+8

OR

(B) (i) Describe likelihood function under various experimental data.

(ii) Explain the stopping rule and describe the importance of this rule. 8+8

5. (A) (a) Define "Dirichlet Distribution". State all its properties.

(b) Explain the importance of ANOVA in bioassay. Write down ANOVA tables for one way and two way. 8+8

OR

(B) (i) Explain the Bayesian approach problem in Bioassay.

(ii) Which prior is used to estimate ED50 ? Explain the concept of prior in Bayes approach for bioassay. 8+8