

FACULTIES OF ARTS AND SCIENCE**B.A. / B.Sc. III – Year Examination, March / April 2015****Subject : STATISTICS (Theory)****Paper – III****Applied Statistics****Time : 3 hours****Max. Marks : 100**

Note : Answer all questions. Answer questions I to IV by choosing any two from each and any three from question V. All questions carry equal marks. Scientific calculators are allowed.

- I
- 1 What is a sample survey? Discuss briefly the basic principles of a sample survey.
 - 2 Derive the variances of sample mean in case of SRSWOR and SRSWR, compare and comment.
 - 3 Describe the procedure of stratified random sampling. Which of the following two is an unbiased estimator of the population mean.

i)
$$\frac{\sum_i n_i \bar{y}_{ni}}{\sum_i w_i}$$

ii)
$$\frac{\sum_i N_i \bar{y}_{ni}}{\sum_i N_i}$$

State the variance of the unbiased estimator.

- 4 Prove that systematic sampling will yield better results only if the units within the sample are heterogeneous.
- II
- 5 Explain the meaning of 'Analysis of variance' technique. State assumptions and applications of it.
 - 6 Identify the given type of design and describe the analysis appropriate for this design.

A	B	C	D
E	A	B	C
D	E	A	B
C	D	E	A
B	C	D	E

- 7 Derive an expression to measure the efficiency of RBD relative to CRD.
- 8 Explain basic principles of experimentation. How far these principles are met in LSD discuss.

- 2 -

- III 9 Define a time series. Explain briefly the components of time series.
- 10 Explain functions and organization of NSSO.
- 11 What is an index number. S.T. Fisher's index number is an ideal index number.
- 12 Fit a logistic curve $y = \frac{K}{1 + e^{a+bt}}$ by the method of three selection points.

- IV 13 a) Explain price and income elasticities of demand.
- b) Find the equilibrium price and quantity exchanged, for the demand curve $d = 250 - 3P^2$ and supply curve $S = P^2 + 2P^4$.
- 14 a) Define a life table, complete life table, and abridged life table.
- b) Fill the blanks in the following life table

Age x :	l_x	dx	px	fx	L_x	T_x	e_x^0	m_x
30 :	762227	-	-	-	-	27296632	-	-
31 :	758580							

- 15 Define the term vital statistics. Describe the methods of collection of vital statistics.
- 16 Explain Pigou's method for time series data.
- V Write short notes on any three of the following :
- 17 Random numbers method
- 18 Missing plot techniques in LSD
- 19 Cost of living index number
- 20 CSO and its functionalities
- 21 Death and birth rates
