PAPER CODE: STA-2A

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN:ELURU

II B.Sc. – III SEMESTER END EXAMINATION – OCTOBER 2016

STATISTICS PAPER III

STATISTICAL METHODS

Time: 3 hrs. Max.Marks:50

SECTION - I

Answer any THREE of the following: 3x8=24M

1. Derive the Spearman's rank correlation coefficient.
2. Regression equations are given 8x-10y+66=0; 40x-18y=214 and variance of X=9. Obtain i) Mean values of X and Y. ii) Correlation coefficient between X and Y.
3. Fir a second degree parabola for the following data

X:	0	1	2	3	4
Y:	1	1.8	1.3	2.5	6.3

4. Define the concept of consistency of data in attributes. Explain the conditions of consistency with respect to three attributes.
5. Explain chi-square and F-distributions along with their properties.
6. Explain method of Maximum Likelihood Estimation with its properties.

SECTION – II

Answer any FOUR questions from the following: 4x4=16M

7. Discuss the properties of correlation coefficient.
8. Distinguish between correlation and regression.
9. Explain the method of fitting the curve of the form $Y=ab^x$ to the given data.
10. Explain any one method of measuring the association of attributes.
11. Discuss about t-distribution.
12. Let $x_1, x_2 \ldots . x_n$ be a random sample drawn from a normal population, the sample variance S^2 is a consistent estimator for the population variance σ^n.

SECTION – III

Answer ALL the following questions. 5x2=10M

13. Scatter diagram.
14. Principle of least squares.
15. Corder of classes in attributes.
16. Properties of t-distribution.
17. Method of moments.

SUBJECT CODE: STA-2A

CH.S.D.ST. THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU

II B.Sc. – III SEMESTER END EXAMINATION – OCTOBER 2017

STATISTICS PAPER III

STATISTICAL METHODS AND INFERENCE

Time: 3 hrs. Max.Marks: 50

SECTION - I

I Answer any THREE of the following: 3x8=24M

1. Calculate correlation coefficient to the following data.

X :	10	15	12	17	13	16	24	14	22	20
Y :	30	42	45	46	33	34	40	35	39	28

2. Derive the regression line of X on Y.
3. Fit an exponential curve of the form $Y=ab^x$ to the following data.

X :	1	2	3	4	5	6	7	8
Y :	1.0	1.2	1.8	2.5	3.6	4.7	6.6	9.1

4. What is Association. Write the coriferion of association of attributes.
5. If X and Y are two independent chi-square random variables with n_1 and n_2 d.f respectively, then prove that X/Y is β -distribution of second kind with parameters $n_1/2$ and $n_2/2$.
6. Show that x is a consistent estimation of μ.

SECTION – II

II Answer any FOUR of the following: 4x4=16M

7. Show that correlation coefficient is independent of shifting the origin and Scale.
8. In a trivariate distribution it is found that $r_{12} = 0.7$, $r_{13}=0.61$, $r_{23}= 0.4$. Find partical correlation coefficients.
9. Fit an exponential curve of the form $Y =ab^x$
10. Derive the relation between Q and Y.
11. Write the applications of F-distribution.
12. If T is an unbiased estimator of 'θ'. S.T T^2 is not an unbiased estimator for θ^2.

SECTION – III

III Answer ALL the following: 5x2=10M

13. Positive correlation with examples.
14. Write the normal equations for straight line.
15. Order of a class and class frequency.
16. Define Statistic.
17. What is likelihood function.

PAPER CODE: STA-2B

CH.S.D.ST. THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU.

II B.Sc. – IV SEMESTER END EXAMINATION – APRIL 2016

STATISTICS PAPER II

STATISTICAL METHODS AND INFERENCE

Time: 3 hrs. Max.Marks: 50

SECTION - I

Answer any THREE of the following questions: 3x8=24

1. State and prove N.P. Lemma.
2. Obtain the best critical region and to test $\theta = \theta_1(<\theta_o)$ and $\theta = \theta_1(>\theta_o)$ against $\theta = \theta_o$ in the case of Normal population $N(\theta, \sigma^2)$, where σ^2 is known also find the power of the test.
3. Give the procedure for the test of significance for the difference of proportions.
4. Give the procedure of F-test for equality of variances.
5. Explain chi-square for goodness of fit.
6. Define RUN and Explain Wald Walfowitz run test.

SECTION – II

Answer any FOUR of the following questions. 4x4=16

7. If 'p' be the probability that a coin will fall head in a single toss inorder to test Ho : p = ½ against H_1: p=3/4. The coin is tossed 5 times and 'H_o' is rejected if more than 3 heads are obtained. Find the probabilities of Type-I and Type II errors and power of the test.

8. Define the following with detail explanation
   i) Most powerful Test
   ii) Level of Significance
9. The mean of two large Samples of sizes 1000 and 2000 are 67.5 and 68.0 respectively. Test the equality of means of 2 populations each with S.D's 2.5.
10. A random sample of 27 pairs of observations from a normal population gave a correlation coefficient of 0.6. Is this significant of correlation in the population?

11. A Survey of 800 families with four children each revealed the following data:

No. of boys:	0	1	2	3	4
No. of girls:	4	3	2	1	0
No. of Families:	32	178	290	236	64

Is this result consistent with the hypothesis that male and female births are equally probable?

12. Give the Assumptions of NP-tests.

P.T.O

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SECTION – III

Answer "ALL" the following questions. 5x2=10

13. Define Non-Randomized Test.
14. Explain Types of Errors.
15. Give the critical values of Z_α at 5% and 1% I.O.S for left tailed test.
16. Give the formula for paired t-test.
17. Give the formula for U-test in casé of large samples.

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SUBJECT CODE: STA-3A

CH.S.D.ST. THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU

III B.Sc. – V SEMESTER END EXAMINATION - OCTOBER 2017

STATISTICS PAPER V

SAMPLING AND EXPERIMENTAL DESIGNS

Time: 3 hrs. Max.Marks: 50

SECTION – I

Answer any THREE of the following: 3x8=24M

1. Explain the principle steps involved in a sample survey.
2. What is Simple random sample. Explain various methods to select a simple random sample.
3. If the population consists of a linear trend, then
   Prove that $V(\bar{Y}_{st}) \leq V(\bar{Y}_{sys}) \leq V(\bar{Y}_n)_{ran}$
4. Carry out the analysis of variance to the following data.

A	10	12	13	11	10	14	15	13
B	9	11	10	12	13			
C	11	10	15	14	12	13		

5. Define CRD. Write the advantages, disadvantages and applications of CRD.
6. Explain the difficulties in estimation of National income in India.

SECTION – II

Answer any FOUR of the following: 4x4=16M

7. Define (i) Population (ii) Sample. Give examples.
8. Explain Lottery method.
9. Show that $V(\bar{Y}_n) = \frac{N-1}{N}\frac{S^2}{n}$ in SRSWR.
10. Show that $E[MSE] = \sigma^2$ in ANOVA two way classification.
11. Discuss about absolute and comparative experiments with examples.
12. Discuss about various defects in agricultural statistics.

SECTION – III

Answer the following: 5x2=10M

13. Probability Sampling.
14. Praportinal allocation.
15. What is critical difference.
16. What is design of experiment.
17. What is GDP.

SUBJECT CODE: STA-4A

CH.S.D.ST. THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU

III B.Sc. – V SEMESTER END EXAMINATION - OCTOBER 2017

STATISTICS PAPER VI

OPERATIONS RESEARCH

Time: 3 hrs. Max.Marks: 50

SECTION - I

Answer any THREE of the following: 3x8=24M

1. What is Operations research. Write the applications of O.R in different fields.

2. Solve the following LPP using Simplex method.

$$\text{Maximize } Z = 5x_1+3x_2$$
$$\text{STC: } 3x_1+5x_2 \leq 15$$
$$5x_1+2x_2 \leq 10$$
$$\text{And } x_1, x_2 \geq 0.$$

3. Solve the following LPP by using duality method.

$$\text{Minimize } Z = 20x_1 + 10x_2$$
$$\text{Subject to constraints: } x_1+x_2 \geq 10$$
$$3x_1+2x_2 \geq 24$$
$$\text{And } x_1, x_2 \geq 0.$$

4. Obtain an IBFS by using Vogel's Approximation method to the following transportation problem.

	D_1	D_2	D_3	D_4	Capacities
	6	6	4	4	
	7	9	1	2	
	6	5	16	7	
	11	9	10	2	
Requirements	10	5	10	5	

5. Explain Hungarian method for solving an Assignment problem.

6. We have five jobs, each of which must go through two machines A and B in the order AB. Processing times (in hours) are given below.

Jobs	1	2	3	4	5
Machine A	5	1	9	3	10
Machine B	2	6	7	8	4

Determine a sequence for the five jobs that will minimize the elapsed time, Also the idle times.

P.T.O. -2-

SECTION – II

Answer any FOUR questions from the following: 4x4=16M

7. Write the mathematical form of Linear programming problem.

8. Write the procedure of changing primal LPP into dual LPP.

9. Show that transportation problem as a special case of LPP.

10. Obtain an IBFS by using least Cost entry method.

	D_1	D_2	D_3	D_4	Availability
	6	8	8	8	
	5	9	7	9	
	8	7	13	6	
Requirement	35	28	32	25	

11. Write the Mathematical formulation of an Assignment problem.

12. How do you formulate traveling salesman problem an assignment problem?

SECTION – III

Answer the following: 5x1=5M

13. Feasible Solution
14. What is duality
15. What is a Loop
16. What is a buffer Stock.
17. Processing Order.

PAPER CODE: STA-3A

CH.S.D.ST.THERESA'S AUTONOMOUS COLLEGE FOR WOMEN:ELURU

III B.Sc. – V SEMESTER END EXAMINATION – OCTOBER 2016

STATISTICS PAPER III

APPLIED STATISTICS

Time: 3 hrs. Max.Marks:50

SECTION – I

Answer any THREE Questions from the following: 3x8=24M

1. Explain the Principle steps in a sample survey.
2. In SRSWOR, derive the variances of the mean Y from a SRS.
3. Explain stratified random sampling along its allocations.
4. Explain the ANOVA – two way classification.
5. Explain the analysis of LSD
6. Discuss the functions and organization of NSSO.

SECTION – II

Answer any FOUR questions from the following: 4x4=16

7. Explain about non-sampling errors.
8. Discuss about SRSWR and SRSWOR.
9. Explain the mixed sampling.
10. Describe local control.
11. Write the merits of RBD.
12. Explain the agricultural statistics.

SECTION – III

Answer ALL the following questions. 5x2=10

13. Define Sampling unit.
14. What is a sampling distribution.
15. Define systematic sampling with an example.
16. Write E.S.S. degrees of freedom in RBD.
17. What is a national income .

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PAPER CODE: STA-4B

CH.S.D.ST. THERESA'S AUTONOMOUS COLLEGE FOR WOMEN: ELURU.

III B.Sc. – VI SEMESTER END EXAMINATION – MARCH 2016

STATISTICS PAPER IV

QUALITY AND RELIABILITY

Time: 3 hrs. Max.Marks: 50

SECTION - I

I Answer any THREE of the following: 3x8=24

1. What is control charts for variables? Construction of X-chart and also R-Chart?
2. Explain control limits for Number of defects per unit? And find No. of defects per unit in 25 Lots Draw a suitable control chart and comment on the Nature of the production process.
   2+2+4=8
   24, 31, 29, 36, 28, 17, 39, 22, 30, 28, 36, 33,
   27, 19, 21, 34, 37, 28, 40, 27, 38, 35, 32, 39, 26.
3. What are the specification limit? An 2
   explain about process capacity Analysis? 6
4. Explain procedure of Double Sampling plan? 3+4+1
   And write its OC and ASN functions for using Binomial distribution.
5. Explain exponential distribution model as failure life model? And also write lack of memory property? 3+2+3
6. Derivation of Reliability function interms of hazard rate? 4+4

SECTION – II

II Answer any FOUR questions from the following: 4x4=16

7. Distinguish with b/w control chart for variables and control chart for Attributes.
8. Explain process control and product control.
9. Explain about producer Risk and consumer Risk?
10. Distinguish clearly b/w (i) AQL (II) LTPD
11. Explain various causes and categories of failures?
12. How many types of System with explanation?
    And Examples? And also Draw series and parallel configurations?

SECTION – III

III Answer ALL the following questions. 5x2=10

13. Controlled and uncontrolled Charts.
14. 3σ control limits.
15. AOQL
16. Hazard rate
17. K-out-of –N System.