

B.A/B. Sc-III Semester- VI

Paper-I (ST-601)

Time: 3 Hours

M.M.:B.Sc: 40+10*

B.A: 28+7*

* Internal Assessment

Statistical Quality Control

Note : There will be nine questions in all. Question No.1 will be compulsory covering whole of the syllabus and comprising 5 to 8 short answer type questions. Rest of the eight questions will be set from the four units uniformly i.e. two from each unit. The candidate will be required to attempt five questions in all selecting one question from each unit and the compulsory one. All the questions will carry equal marks except the compulsory question, the distribution of marks for which will be as follows:-

B.Sc.8 marks and B.A. 6 marks.

UNIT-I

Statistical Quality Control : Meaning and uses of SQC, causes of variations in quality, product and process control, control charts, 3- σ control limits, control chart for variables- \bar{X} and R chart, criteria for detection of lack of control in \bar{X} & R Charts, Interpretation of \bar{X} & R charts.

UNIT-II

Control chart for standard deviation (σ chart), control charts for attributes: 'p' chart and 'c' chart, Concept of 6- σ limits.

UNIT-III

Acceptance sampling : Problem of lot acceptance, stipulation of good and bad lots, producer's and consumers risks, single and double sampling plans, their OC functions, concepts of AQL, LTPD, AOQL, average amount of inspection and ASN function.

UNIT-IV

Demand Analysis : Laws of demand and supply, price elasticity of demand, demand function with constant price elasticity, partial and cross elasticities of demand, types of data required for estimating elasticities: family budget data, time series data- Leontief's and Pigous's methods to estimate demand functions. Engel's law of income and expenditure, Pareto's Law of income distribution, curves of concentration, Lorenz curve and Gini's coefficient.

Books recommended

S. No.	Title of Book	Name of author	Publisher
1.	Statistical Quality Control	Grant E.L.	McGraw Hill
2.	Statistical Methods in Quality Control	Cowden D.J.	Asia Pub. Society
3.	Statistical Theory and Methodology in Science & Engineering	Brownlee K.A.	John Wiley & Sons
4.	Engineering Statistics	Bowker H.A. & Liberman G.T.	Prentice Hall
5.	Fundamentals of Applied Statistics	Gupta S.C. & Kapoor V.K.	Sultan Chand & Sons
6.	Fundamentals of Statistics, Vol. II	Goon A.M., Gupta & M.K. Dasgupta B.	World Press Calcutta

B.A/B. Sc-III Semester- VI

Paper-II (ST-602)

Time: 3 Hours

M.M.:B. Sc: 40+10*

B.A: 28+7*

* Internal Assessment

Operations Research

Note : There will be nine questions in all. Question No.1 will be compulsory covering whole of the syllabus and comprising 5 to 8 short answer type questions. Rest of the eight questions will be set from the four units uniformly i.e. two from each unit. The candidate will be required to attempt five questions in all selecting one question from each unit and the compulsory one. All the questions will carry equal marks except the compulsory question, the distribution of marks for which will be as follows:-

B.Sc.8 marks and B.A. 6 marks.

UNIT-I

Objective of O.R., nature and definitions of O.R., Scope of O.R., Meaning and necessity of O.R. models, classification of O.R. models, Advantages & disadvantages of O.R. models. Steps in model formulation, principles of modeling. Characteristics of a good model, Allocation problems.

UNIT-II

Linear programming problem (LPP): Definition, objective function, constraints, graphical solution of L.P.P., limitations of graphical method, Simplex method to solve L.P.P., concept of initial basic feasible solution, computation procedure for Simplex method.

UNIT-III

Artificial variable techniques: Big-M method, Two-phase method. Duality in Linear Programming; Concept of duality, Fundamental properties of duality.

UNIT-IV

Transportation Problem (T.P.): Formulation, Basic feasible solution. Different methods to find initial feasible solution: North-West corner rule, Row minima method, column minima method, Matrix minima method (Least cost entry method), Vogel's Approximation method (or Unit cost penalty method). UV-method (Modi's method) for finding the optimum solution of T.P.

Books recommended

S. No.	Title of Book	Name of author	Publisher
1.	Operations Research	Hillier F.S. & Lieberman G.J.	Tata McGraw Hill
2.	Linear Programming	Hadley G.	Narosa
3.	Operations Research: An Introduction	Taha H.A.	Macmillan Pub. Co.
4.	Operations Research	Goel B.S. & Mittal S.K.	Pragati Prakashan
5.	Operations Research	Sharma S.D.	KedarNath & Co.
6.	Operations Research	Sharma J.K.	Macmillan Pub.

B.A/B. Sc-III

Paper-III (Practical ST-603)

Time: 3 Hours

Max. Marks: B. Sc: 100

B.A: 60

Practical

Note: Five questions will be set. The candidate will be required to attempt any three.

1. To construct \bar{X} and R-chart, and comment on the state of control of the process.
2. To construct p-chart and d-chart, and comment on the state of control of the process.
3. To obtain control limits for number of defects and comment on the state of control plotting the appropriate chart.
4. To calculate price and quantity index numbers using the formulae given by Laspyre, Paasche, Marshal- Edgeworth and Fisher.
5. To obtain cost of living index numbers for the given data using (i) Aggregate Expenditure Method. (ii) Family Budget Method
6. To test the given data whether the formulae given by Laspyre, Paasche, Marshal- Edgeworth and Fisher, satisfy reversal tests.
7. To work out trends using curve fitting method for given data.
8. To work out trends using moving average method for given data.
9. To obtain seasonal variation indices using simple average method.
10. To obtain seasonal variation indices using ratio to moving average method.
11. To calculate the crude and standardized death rates of the population using Direct Method and Indirect Method regarding one of the populations as standard population.
12. To calculate the following for the given data
CDR, CBR, Sex/Age SDR, GFR, TFR, GRR, NRR.
13. To complete the given incomplete life table by computing various elements of life table.
14. To interpolate the required value for the given data using Newton's Forward/backward interpolation formula for equal intervals.
15. To interpolate the required value for the given data of using Newton's divided difference and Lagrange's interpolation formula.

16. To evaluate the integral of the type $\int_a^b f(x) dx$ using

- (i) Trapezoidal rule, (ii) Simpson's one-third rule
- (iii) Simpson's three-eighth rule

17. Fitting of Pareto's curve to income data.

18. Estimation of price-elasticity from time series data.

Distribution of marks:

	B. Sc.	B.A
Class Record:	10	06
Viva Voce:	10	06
Practical:	80	48

