To be effective from Year 2016-2017

New Syllabus of Gujarat University for B. Com. **Semester - III**

CC 205 STATISTICS – III

Unit 1 : Limit And Continuity of Function (25 %)

Concept of function of one variable (Linear, Quadratic and Exponential function). Domain, Co-domain and Range of the function. (Theoretical explanation with illustration and without examples)

Limit of a function, Rules of limit (without proof), Formulae for limit of standard functions, $\frac{x^n-a^n}{x-a}$, $\frac{a^x-1}{x}$ and $\frac{e^x-1}{x}$.

Sums of limit of function y = f(x) where f(x) is a polynomial function of x or a rational function showing the ratio of two polynomial function or a function on the basis of standard form.

Meaning of continuity (including the concept of left hand limit and right hand limit). Sums of continuity of function y=f(x) where f(x) is a polynomial function or a rational function.

Unit 2: Probability (25%)

Random experiment, sample space, event and definition of various events. Mathematical, Statistical and Axiomatic definitions of probability. Addition and multiplication rule and sub rules of the probability (without proof). Simple examples of probability and conditional probability. Bayes' theorem (without proof) and sums showing use of it up to three events.

Unit 3 : Mathematical Expectation and Moments (25 %)

Meaning of discrete random variable, concept of probability function of discrete random variable. Definition of expected value (mathematical expectation) of random variable and its properties (without proof). Definition of variance and covariance and their formulae. Simple mathematical and applied examples of on it.

Central and Raw Moments (First four) of discrete random variable, Formulae showing the relation between central moments and raw moments (without proof). Concept of Skewness and Kurtosis and their interpretations. Simple examples based on unclassified data, classified data (frequency distribution) and probability distribution.

Unit –4 : Negative Binomial and Geometric Distribution (25 %)

Meaning, definition, properties (without proof) and uses of Negative Binomial Distribution. Simple related examples. Deriving probability mass function of Geometric distribution from Negative Binomial distribution, its properties (without proof) and uses. Simple related examples.

Reference Books :

1. Goon. Gupta, Dasgupta, An outline of Statistical Theory, Vol -1 and II World Press, Calcutta.
2. Sancheti & Kapoor, Business Statistics. Sultan Chand & Sons, New Delhi.
3. David R. Anderson, Dennis J. Sweeney, Thomas A. Williams, Statistics For Business and Economics, South - Western Cengage Learning India Pvt. Ltd. New Delhi.
4. Levin and Rubin, Statistics for Management, Prentice Hall of India Pvt. Ltd. New Delhi.
5. Parimal Mukhopadhyay : Theory and Methods of Survey Sampling, Perntice Hall of India, New Dlehi.
6. Trivedi and Trivedi: Business Mathematics, Pearson India Ltd. New Delhi.

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New Syllabus of Gujarat University for B. Com. **Semester - III**

CORE ELLECTIVE ADVANCED SATISTICS

CE 201 (B) Advanced Statistics – III

1: Principle of Mathematical Induction and Binomial Theorem **[**25%]

Meaning of Principle of Mathematical Induction and Simple illustrative problems based on it. Binomial expansion of $(x \pm a)^n$ where n is a positive integer, Characteristics of Binomial expansion, its application in simple examples.

2: Multiple and Partial Correlation and Regression : **[25%]**

Definition and concept of Partial and Multiple Correlation (three variables), Concept Multiple Regression equations, Numerical example.

3: Sampling Methods - 1 : **[25%]**

Meaning of population and sample, need for sampling, Definition of population size and sample size, points to be considered for determining sample size, Theoretical description of different sampling methods (i) Non probabilistic sampling methods- convenience, quota, judgmental, purposive (ii) Probabilistic sampling methods- simple random sampling method, stratified random sampling method, systematic sampling method, two stage sampling method, cluster sampling method, sequential sampling method, and their comparisons.

4: Sampling Methods - 2 : **[25%]**

Verification of various results- (i) mean of sample mean is an unbiased estimator for sample mean (ii) verification of the formulae for variance of sample mean (iii) sample variance is an unbiased estimator for population variance, (for with replacement and without replacement simple random sampling) Simple numerical examples for stratifies random sample- to verify the result that the stratified random sample mean is an unbiased estimator for population variance and calculation of the variance of stratified sample mean, Simple numerical examples for systematic sample- to verify the result that the systematic random sample mean is an unbiased estimator for population variance and calculation of its variance.

Reference Books :

1. Goon. Gupta, Dasgupta, An outline of Statistical Theory, Vol - 1 and II. World Press, Calcutta.
2. Sancheti & Kapoor, Business Statistics. Sultan Chand & Sons, New Delhi.
3. David R. Anderson, Dennis J. Sweeney, Thomas A. Williams, Statistics For Business and Economics, South-Western Cengage Learning India Pvt. Ltd. New Delhi.
4. Levin and Rubin, Statistics for Management, Prentice Hall of India Pvt. Ltd. New Delhi.
5. Parimal Mukhopadhyay, Theory and Methods of Survey Sampling, Perntice Hall of India, New Dlehi.
6. Amir D Aczel, Jayavel Sounderpandian, Complete Business Statistics, Tata Mc Graw Hill, New Delhi.

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New Syllabus of Gujarat University for B. Com. **Semester - III**

CE 202 (B) Advanced Statistics - IV

1. Input - Output Analysis : [25%]

Meaning of Input - output analysis, assumption and limitations, Leontief's static open model - importance and application of the model, Simple examples up to the matrix of order 3×3.

2. Distribution of Income and Economic Models : [25%]

Concept of Income Distribution models, Study of Paroto's income distribution-analysis and interpretations. Lorentz curve of concentration, Fitting of Pareto and Lorentz curves - numerical examples only. Classical models- structural equations and structural parameters of model, Linear homogeneous equation system, study of (i) price determination model and (ii) income determination model.

3. Time Series : [25%]

Meaning and uses of time series, Various components of time series, determination of trend by using graphical, moving average and least square method, To separate seasonal component by using sale forecasts and seasonal variation by using moving average method, link relative method, with examples.

4. Interpolation and Extrapolation: [25%]

Meaning and scope for Interpolation and Extrapolation. Understanding of the operators Δ and E. Newton's method, Binomial expansion method and Lagrange method.

Reference Books :

1. J. K. Sharma, Mathematics for Business and Economics, Asian Books Private Ltd
2. S. C. Gupta, V. K. Kapoor, Fundamentals of Applied Statistics, Sultan Chand & Sons, New Delhi.
3. David R. Anderson, Dennis J. Sweeney, Thomas A. Williams, Statistics For Business and Economics, South - Western Cengage Learning India Pvt. Ltd. New Delhi.
4. S.C. Gupta: "Fundamentals of Mathematical Statistics" S. Chand, New Delhi.
5. Levin and Rubin: "Statistics for Management", Prentice Hall of India Pvt. Ltd. New Delhi.