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VEER NARMAD SOUTH GUJARAT UNIVERSITY

University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.

વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી

યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

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સંદર્ભ:યુનિવર્સિટી પરિપત્ર ક્રમાંક/એસ./આંકડાશાસ્ત્ર/પરિપત્ર/૧૬૦૮૩/૨૦૨૩ તા.૦૧/૦૭/૨૦૨૩

-: પરિપત્ર :-

વિનયન વિદ્યાશાખા હેઠળની સંલગ્ન આંકડાશાસ્ત્ર વિષયની તમામ કોલેજોનાં આચાર્યશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૩-૨૪ થી અમલમાં આવનાર નવા સ્ટ્રક્ચર અનુસાર આંકડાશાસ્ત્ર વિષયના F.Y.B.A. Sem.-1 & 2 ના Major, Minor, Multidisciplinary, SEC અને VAC ના અભ્યાસક્રમ સંદર્ભે આંકડાશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૨૧/૦૭/૨૦૨૩ ની સભાના ઠરાવ ક્રમાંક : ૩ અન્વયે કરેલ ભલામણ સ્વીકારી વિનયન વિદ્યાશાખાની તા.૦૫/૦૮/૨૦૨૩ ની સભાનાં ઠરાવ ક્રમાંક: ૨૨ અન્વયે કરેલ ભલામણ એકેડેમિક કાઉન્સિલ તા.૦૭/૦૮/૨૦૨૩ ની સભાનાં ઠરાવ ક્રમાંક: ૬૯ થી સ્વીકારી મંજૂર કરેલ છે, જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

આંકડાશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૨૧/૦૭/૨૦૨૩ ની સભાનાં ઠરાવ ક્રમાંક: ૩

:: આથી ઠરાવવામાં આવે છે કે, આંકડાશાસ્ત્ર વિષયના F.Y.B.Com.,/B.A. અને B.Sc.Sem- 1 & 2 ના મેજર, માઈનર અને મલ્ટિડિસિપ્લિનરીના અભ્યાસક્રમને ૩ ક્રેડિટને ૪ ક્રેડિટનો તથા SEC, VACનાં અભ્યાસક્રમને ૩ ક્રેડિટને બદલે ૨ ક્રેડિટ તરીકે ગણવો. અને તેના ટાઈટલ નીચે મુજબ રાખવા વિનયન વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.

F.Y.B.A. Sem.-1 (Major)

Statistics - 1

Statistics - 2

F.Y.B.A. Sem.-2 (Major)

Statistics - 3

Statistics - 4

F.Y.B.A. Sem.1 (MDC)

Elements of Statistics

F.Y.B.A. Sem.2 (MDC)

Measures Statistics

F.Y.B.A. Sem.1 (VAC)

Official Statistics

F.Y.B.A. Sem.-1 (Minor)

Statistics - 1

F.Y.B.A. Sem.-2 (Minor)

Statistics - 2

F.Y.B.A. Sem.1 (SEC)

Statistics for Social Science-1

F.Y.B.A. Sem.2 (SEC)

Statistics for Social Science -2

F.Y.B.A. Sem.2 (VAC)

Descriptive Statistics

વિનયન વિદ્યાશાખાની તા.૦૫/૦૮/૨૦૨૩ની સભાનાં ઠરાવ ક્રમાંક: ૨૨

:: આથી ઠરાવવામાં આવે છે કે, આંકડાશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૨૧/૦૭/૨૦૨૩ ની સભાનાં ઠરાવ ક્રમાંક: ૩ અન્વયે કરેલ ભલામણ સ્વીકારી શૈક્ષણિક વર્ષ ૨૦૨૩-૨૪ થી અમલમાં આવનાર આંકડાશાસ્ત્ર વિષયનો F.Y.B.A. Sem.-1 & 2 નો Major, Minor, Multidisciplinary, SEC અને VAC ના અભ્યાસક્રમો મંજૂર કરવા એકેડેમિક કાઉન્સિલને ભલામણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૨૩/૦૬/૨૦૨૩ની સભાનાં ઠરાવ ક્રમાંક: ૬૯

:: આથી ઠરાવવામાં આવે છે કે, વિનયન વિદ્યાશાખા તા.૫/૦૮/૨૦૨૩ ની સભાનાં ઠરાવ ક્રમાંક: ૨૨ અન્વયે કરેલ ભલામણને સુધારા વધાર સાથે સ્વીકારી મંજૂર કરવામાં આવે છે.

(બિડાણ: ઉપર મુજબ)

ક્રમાંક : એસ./ આંકડાશાસ્ત્ર /પરિપત્ર/ ૨૦૭૬૯/૨૦૨૩

તા.૦૮-૦૮-૨૦૨૩

પ્રતિ,

૧) વિનયન વિદ્યાશાખા હેઠળની સંલગ્ન આંકડાશાસ્ત્ર વિષયની તમામ કોલેજોનાં આચાર્યશ્રીઓ.

..... આપશ્રીની કોલેજના સંબંધિત શિક્ષકોને જાણ કરી અમલ કરવા સારું.

૨) અધ્યક્ષશ્રી, વિનયન વિદ્યાશાખા.

૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ.યુનિવર્સિટી, સુરત,....તરફ જાણ તેમજ અમલ સારું.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A. SEMESTER -I

SYLLABUS OF

STATISTICS-I(Major) Credit-4

As per NEP-2020

To be Implemented from the academic year 2023-24

On completion of the course, the student will be able to:			
CO1	They will be able to find linear relation between independent and dependent variables. Compute limits, derivatives, and definite & indefinite integrals of algebraic, logarithmic and exponential functions.		
CO2	They will be able to Compute limits, derivatives, and definite & indefinite integrals of algebraic, logarithmic and exponential functions.		
CO3	The concepts of total differential and partial derivative functions shall be understood		
CO4	Applications of these techniques in the fields of business and commerce shall be done.		
CO5	They shall develop proficiency in using different mathematical tools in solving daily life problems.		
OBJECTIVES			
<ul style="list-style-type: none">❖ Applications of linear equation are useful to estimate value of dependent variable for given value of independent variable.❖ Various uses of function in economics, industry, business and social science.❖ limit differentiation in social sciences , commerce and business for finding maximum profit or minimum cost.			
UNIT-1	<u>Equations</u> <ul style="list-style-type: none">➤ Types of equations<ul style="list-style-type: none">• Uses of equations• Examples..	10%	5 Marks
UNIT-2	<u>Function</u> <ul style="list-style-type: none">• Definition of function.➤ Types of function.<ul style="list-style-type: none">• Linear function.• Parabolic function.• Domain of function.• Range of function.• Graph of linear and parabolic function .• Examples	25%	12.5 Marks

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UNIT-3	<u>limits</u> <ul style="list-style-type: none"> • Definition of limit. • Meaning of $\lim_{x \rightarrow 0}$, $\lim_{x \rightarrow a}$, $\lim_{x \rightarrow \infty}$, $\lim_{x \rightarrow -\infty}$. • Rules of limits. • Examples.. 	25%	12.5 Marks
UNIT-4	<u>Differentiation.</u> <ul style="list-style-type: none"> ➤ <u>Definition of differentiation.</u> <ul style="list-style-type: none"> • Examples based on definition. • Rules of differentiation of function. <ul style="list-style-type: none"> ○ Addition. ○ Subtraction. ○ Multiplication. ○ Divison. • Examples ➤ Uses of differentiation. <ul style="list-style-type: none"> • Maximum and Minimum value of function. • Marginal values of different types of economical functions. 	40%	20 Marks.

Reference Books

1.	Gupta S.P.(2006)	Statistical Methods 34 th Edition S. Chand & Sons., New Delhi.
2.	P.G.Hoel	Elements of statistics.
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II. 8 th Edn.. The world Press, Kolkata.
4.	D.N.Elhance, Veena Elhance.	Fundamental of Statistics.
5.	S.P.Gupta & V.K. Kapoor.	Fundamental of Mathematical Statistics : S. Chand & Co. New Delhi.
6.	D.C.Sancheti, V.K. Kapoor.	Statistics.
7.	Mood, Graybill and Boes (2007)	Introduction to the theory of Statistics. 3 rd Edn.(Reprint), Tata Mcgraw hill Pub. Co. Ltd.
8.	Pavate D.C. Bhagwat	The Element Calculus.
9.	Karmel P.H.(1963)	Applied Statistics for Economics, 2 nd ed.
10.	Prof H.D. Shah.	ગાણિતિક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ – અમદાવાદ, ગુજરાત.
11.	M.C.Jayswal(1974)	અર્થ વિષયક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ – અમદાવાદ, ગુજરાત.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A.

SEMESTER -I

SYLLABUS OF

STATISTICS-II(Major)-Credit-4

As per NEP-2020

To be Implemented from the academic year 2023-24

On completion of the course, the student will be able to:			
CO1	Understand the meaning and calculation of various types of index numbers.		
CO1	Understand the concept of hypothesis and its testing and applications in various fields; Identify the components of a classical hypothesis test, including the parameter of interest, the null and alternative hypotheses, type I error and type II error, Critical region, the test statistic etc;		
CO2	Carry out appropriate statistical test of significance; Obtain different large and small sample tests relate to Find chi-square variates.		
CO3	Understand the difference between large and small sample and tests based on it;		
CO4	Able to make decision rule with use of statistical testing of hypothesis.		
CO5	How it is applicable in Agriculture, business, Industry and social science.		
OBJECTIVES			
The main objective of this course is to acquaint students to study various types of index numbers and how it is useful in planning and to know growth of various countries with techniques of calculating HDI and make analysis. Hypothesis procedure is useful to make decision about assumption about the parameters of the population or probability distribution based on personal institution or from the past experience. Uses of large sample test and small sample test for solving real life problem, social science problem or industrial problem, Agricultural problem.			
UNIT-1	Index number. <ul style="list-style-type: none">➤ Meaning of index number.<ul style="list-style-type: none">• Characteristics of index number• Uses of index number.➤ Construction of wholesale index number.➤ Methods of computation of<ul style="list-style-type: none">• Laspayer's index number• Pasche's index number.	30%	15 Marks

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	<ul style="list-style-type: none"> • Fisher's index number. • Bowley's index number. • Marshal Edgeworth index number. • Human development index number.(HDI) • Time reversal and factor reversal test. ➤ Construction of Cost of living index number. • Examples.. 		
UNIT-2	<p>Testing of hypothesis.</p> <ul style="list-style-type: none"> ➤ Define terms : <ul style="list-style-type: none"> • Hypothesis, • Statistical hypothesis, • Simple and composite hypothesis. • Null and composite hypothesis. • Acceptance and Critical region. • Type – I and Type- II error. • Level of significance. ➤ Procedure for testing of hypothesis. 	20%	10 Marks
UNIT-3	<p>Large sample test.</p> <ul style="list-style-type: none"> ➤ Large sample test for attributes. <ul style="list-style-type: none"> • Test of number of success. • Test of single proportion. • Test of difference of two proportions. ➤ Large sample test for variables. <ul style="list-style-type: none"> • Test for population mean. • Test of differences of two means. • Test of differences of two standard deviations. • Test of correlation of coefficient. 	30%	15 Marks
UNIT-4	<p>Small sample test procedure.</p> <ul style="list-style-type: none"> ➤ Concept of sampling distribution and standard error. <ul style="list-style-type: none"> • Definition of t -statistics • Assumptions of t –statistics ➤ Applications of t – statistics. <ul style="list-style-type: none"> • Test for single mean. • Test for difference of two means. • Test for correlation coefficient. ➤ Chisquare test <ul style="list-style-type: none"> • To test the goodness of fit • To test the independence of attributes. • To test the specified value of the variance of the population. ➤ F test <ul style="list-style-type: none"> • Test for equality of two population variances. 	20%	10 Marks

Reference Books

1.	Gupta S.P.(2006)	Statistical Methods 34 th Edition S. Chand & Sons., New Delhi.
2.	P.G.Hoel	Elements of statistics.
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II. 8 th Edn.. The world Press. Kolkata.
4.	D.N.Elhance, Veena Elhance.	Fundamental of Statistics.
5.	S.P.Gupta & V.K. Kapoor.	Fundamental of Mathematical Statistics : S.

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		Chand & Co. New Delhi.
6.	D.C.Sancheti, V.K. Kapoor.	Statistics.
7.	Mood, Graybill and Boes (2007)	Introduction to the theory of Statistics. 3 rd Edn.(Reprint). Tata Mcgraw hill Pub. Co. Ltd.
8.	Pavate D.C. Bhagwat	The Element Calculus.
9.	Karmel P.H.(1963)	Applied Statistics for Economics, 2 nd ed.
10:	Prof H.D. Shah.	ગાણિતિક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ – અમદાવાદ, ગુજરાત.
11.	M.C.Jayswal(1974)	અર્થ વિષયક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ – અમદાવાદ, ગુજરાત.
12.	Hogg and Craige	Introduction to mathematical statistics.
13.	Stuart G. and Ord. J. K. (1991)	Advanced theory of statistics.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A. SEMESTER -I

SYLLABUS OF

STATISTICS-I(Minor)

Mathematical Statistics (Credit-4)

As per NEP-2020

To be Implemented from the academic year 2023-24

On completion of the course, the student will be able to:			
CO1	They will be able to find linear relation between independent and dependent variables. Compute limits, derivatives, and definite & indefinite integrals of algebraic, logarithmic and exponential functions.		
CO2	They will be able to Compute limits, derivatives, and definite & indefinite integrals of algebraic, logarithmic and exponential functions.		
CO3	The concepts of total differential and partial derivative functions shall be understood		
CO4	Applications of these techniques in the fields of business and commerce shall be done.		
CO5	They shall develop proficiency in using different mathematical tools in solving daily life problems.		
OBJECTIVES			
<ul style="list-style-type: none">❖ Applications of linear equation is useful to estimate value of dependent variable for given value of independent variable.❖ Various uses of function in economics, industry, business and social science.❖ limit differentiation in social sciences , commerce and business for finding maximum profit or minimum cost.			
UNIT-1	<u>Equations</u> <ul style="list-style-type: none">➤ Types of equations<ul style="list-style-type: none">• Uses of equations• Examples..	10%	5 Marks

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UNIT-2	Function <ul style="list-style-type: none"> • Definition of function. ➤ Types of function. <ul style="list-style-type: none"> • Linear function. • Parabolic function. • Domain of function. • Range of function. • Graph of linear and parabolic function . • Examples 	25%	12.5 Marks
UNIT-3	limits <ul style="list-style-type: none"> • Definition of limit. • Meaning of $\lim_{x \rightarrow 0}$, $\lim_{x \rightarrow a}$, $\lim_{x \rightarrow \infty}$, $\lim_{x \rightarrow -\infty}$. • Rules of limits. • Examples.. 	25%	12.5 Marks
UNIT-4	Differentiation. <ul style="list-style-type: none"> ➤ Definition of differentiation. <ul style="list-style-type: none"> • Examples based on definition. • Rules of differentiation of function. <ul style="list-style-type: none"> ○ Addition. ○ Subtraction. ○ Multiplication. ○ Division. • Examples ➤ Uses of differentiation. <ul style="list-style-type: none"> • Maximum and Minimum value of function. • Marginal values of different types of economical functions. 	40%	20 Marks.

Reference Books

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2.	P.G.Hoel	Elements of statistics.
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II, 8 th Edn.. The world Press, Kolkata.
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11.	M.C.Jayswal(1974)	અર્થ વિષયક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ - અમદાવાદ, ગુજરાત.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A.

SEMESTER –I

STATISTICS (Multidesiplinary)

Elements of Statistics.

Credit-4

As per NEP-2020

To be Implemented from the academic year 2023-24

	On completion of the course, the student will be able to:		
CO1	Implement data analysis strategies to develop efficient models for various theoretical postulations.		
CO2	Develop the skills to analyze complex statistical data coming from the various fields like industry, marketing, finance, agriculture and business		
CO3	Create different types of charts		
CO4	Create different types of graphs.		
CO5	Communicate statistical concepts to non-statisticians.		
OBJECTIVES			
The main objective of this course is to acquaint students learn how to visualize your data; Create bar diagram, pie chart, box plot chart etc; Construct and interpret a graph like histogram, frequency polygon and frequency curve for numerical data. Draw meaningful conclusions from a set of data.			
UNIT-1	Nature, scope of statistics, Compilation of data ➤ Meaning, definition, uses and limitations of statistics ➤ Methods of collection of data, <ul style="list-style-type: none">• Primary data and secondary data• Methods of collecting primary data• Sources of secondary data, precautions for use of secondary data, characterise of ideal questionnaire.	30%	15 Marks
UNIT-2	Classification, Tabulation, Diagrammatic and Graphic presentation of Data and Charts ➤ Classification <ul style="list-style-type: none">• Meaning of classification• Characteristics of a good classification• Advantages of classification• Types of classification	40%	20 Marks

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	<ul style="list-style-type: none"> ➤ Tabulation <ul style="list-style-type: none"> • Meaning of tabulation. • Objectives of tabulation. • Rules for construction of tabulation. • Types of tables • Difference between classification and tabulation.. 		
UNIT-3	<ul style="list-style-type: none"> ➤ Diagrams <ul style="list-style-type: none"> • Rules for construction of diagrams • Types of diagrams : Line diagrams, Bar diagrams ➤ Graphs Graphs of frequency distributions: Histogram, Frequency polygon, Frequency curve, Cumulative frequency curve 	30%	15

Reference Books

1.	Gupta S.P.(2006)	Statistical Methods 34 th Edition S. Chand & Sons., New Delhi.
2.	P.G.Hoel	Elements of statistics.
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II. 8 th Edn.. The world Press, Kolkata.
4.	D.N.Elhance, VeenaElhance.	Fundamental of Statistics.
5.	S.P.Gupta& V.K. Kapoor.	Fundamental of Mathematical Statistics : S. Chand & Co. New Delhi.
6.	D.C.Sancheti, V.K. Kapoor.	Statistics.
7.	Mood, Graybill and Boes (2007)	Introduction to the theory of Statistics, 3 rd Edn.(Reprint), Tata Mcgraw hill Pub. Co. Ltd.
8.	Prof H.D. Shah.	ગાણિતિક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ - અમદાવાદ, ગુજરાત.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A. SEMESTER -I

SYLLABUS OF STATISTICS (SEC)

(Statistics for Social Science-I) Credit-2

As per NEP-2020

To be Implemented from the academic year 2023-24

	On completion of the course, the student will be able to:		
CO1	Understand meaning of demand and supply		
CO2	Understand the effect of price on the demand and supply. Student also interpret the market equilibrium situation.		
CO3	Understand about Index numbers, criteria for a good index number, different types of index numbers, construction of index numbers, consumer price index number.		
CO4	uses and limitations of index numbers		
OBJECTIVES			
<p>Students can acquainted Various uses of function in economics, industry, business and social science Students can acquainted use of index number in statistics is a tool that generally uses to measure the difference in relative changes from time to time. The difference can also be from place to place. Students can acquainted use of index numbers how it helps the Government to formulate its price policies. They are also used to-evaluate the purchasing power of money. Index numbers are also being used for forecasting business and economic activities, business cycles.</p>			
UNIT-I	<ul style="list-style-type: none"> ➤ Demand <ul style="list-style-type: none"> ▪ Meaning of demand ▪ Assumptions of demand function. ▪ Graphical representation of demand curve. ▪ Price elasticity of demand. ▪ Interpretation of elasticity of demand. ➤ Supply <ul style="list-style-type: none"> ▪ Assumptions of supply function. ▪ Graphical representation of supply curve. ▪ Price elasticity of supply. ▪ Interpretation of elasticity of supply. ▪ Market equilibrium. ➤ Revenue, Cost and profit function. <ul style="list-style-type: none"> ▪ Procedure for maximization of revenue and profit function. ▪ Procedure for minimization of cost function. 	50%	25 Marks

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UNIT-2	Index number. <ul style="list-style-type: none"> ✓ Meaning of index number. <ul style="list-style-type: none"> • Characteristics of index number • Uses of index number. ✓ Construction of wholesale index number. ✓ Methods of computation of <ul style="list-style-type: none"> • Laspayer's index number • Pasche's index number. • Fisher's index number. • Bowley's index number. • Marshal Edgeworth Index number. • Human development index number. • Time reversal and factor reversal test. • Examples.. 	50%	25 Marks
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Reference Books

1.	Gupta S.P.(2006)	Statistical Methods 34 th Edition S. Chand & Sons., New Delhi.
2.	P.G.Hoel	Elements of statistics.
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II, 8 th Edn.. The world Press, Kolkata.
4.	D.N.Elhance, Veena Elhance.	Fundamental of Statistics.
5.	S.P.Gupta & V.K. Kapoor.	Fundamental of Mathematical Statistics : S. Chand & Co. New Delhi.
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7.	Mood, Graybill and Boes (2007)	Introduction to the theory of Statistics, 3 rd Edn.(Reprint). Tata Mcgraw hill Pub. Co. Ltd.
8.	Prof H.D. Shah.	ગણિતિક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ - અમદાવાદ, ગુજરાત.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A. SEMESTER –I

Statistics (VAC)

Official Statistics. Credit-2

As per NEP-2020

To be Implemented from the academic year 2023-24

	On completion of the course, the student will be able to:		
CO1	Students get idea of development of our country through Indian official statistics.		
CO2	Students acquainted the knowledge of growth of our nation.		
CO3	Students acquainted the knowledge of comparing growth of our countries. with other countries.		
CO4	Students acquainted the knowledge of various methods for calculation of population census		
CO5	Decide which method is appropriate		
OBJECTIVES			
The main objective of this course is to acquaint students learn how to visualize growth of country in various sector like agriculture, industry, communication and in economic sector data;			
Compare the result of various methods of complete enumeration population survey methods			
Decide which method is appropriate for area.			
UNIT-1	<ul style="list-style-type: none">• Indian official statistics• Central statistical organization (CSO)• National Sample survey organization	50%	25 Marks
UNIT-2	<ul style="list-style-type: none">• Population studies• Methods of collection of population.• Different calculation of india and its studies	50%	25 Marks
Reference Books			
1.	Gupta S.P.(2006)	Statistical Methods 34 th Edition S. Chand & Sons., New Delhi.	
2.	P.G.Hoel	Elements of statistics.	
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II, 8 th Edn.. The world Press, Kolkata.	
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7.	Mood, Graybill and Boes (2007)	Introduction to the theory of Statistics, 3 rd Edn,(Reprint), Tata Mcgraw hill Pub. Co. Ltd.	
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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A. SEMESTER -II

SYLLABUS OF

STATISTICS-III (Major)-Credit-4

	On completion of the course, the student will be able to:		
CO1	They will identify independent and dependent variables and establish mathematical relation.		
CO2	Understand use of appropriate method of interpolation for a given values of independent variables for equal intervals and estimate value of dependent variable.		
CO3	Understand use of appropriate method of interpolation for a given values of independent variables for un-equal intervals and estimate value of dependent variable.		
CO4	Permutation is used for the list of data (where the order of the data matters)		
CO5	Combination is used for the list of data (where the order of the data no matters)		
CO6	Be familiar with some basic concepts of probability Disstinguish between random and non-random experiments; Understandaxiomsofprobabilityandvarioustheoremsonprobability; Findtheprobabilitiesofvarioussevents. Understandtheconceptsofconditionalprobabilityandindependenceofevents		
OBJECTIVES			
<ul style="list-style-type: none"> ❖ Use of various methods of interpolation for a given values of independent variables for equal intervals and able to estimate the value of dependent variable. ❖ Use of various methods of interpolation for a given values of independent variables for un equal intervals and able to estimate the value of dependent variable. ❖ Permutations are studied in almost every branch of mathematics. They also appear in many other fields of science. In computer science they are used for analyzing sorting algorithms, in quantum physics for describing states of particles and in biology for describing RNA sequences. ❖ Combinations are studied It also appear in many other fields of science. In computer science they are used for analyzing sorting algorithms, in quantum physics for describing states of particles, and in biology and useful for solving real life problems. ❖ Able to find probabilies of various events which are from daily life problems, social science problems, industrial problems Etc. 			
UNIT-I	<ul style="list-style-type: none"> ➤ Definition of interpolation <ul style="list-style-type: none"> ▪ Assumptions ▪ Uses ➤ Interpolation for equal intervals <ul style="list-style-type: none"> ▪ Newton's forward difference interpolation 	25%	12.5Marks

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	<ul style="list-style-type: none"> formula(without proof) ▪ Newton's backward difference interpolation formula (without proof) ▪ Binomial expansion (without proof) ▪ Examples. ➤ Interpolation for unequal intervals. <ul style="list-style-type: none"> ▪ Lagrange's interpolation formula. (without proof) ▪ Examples. 		
UNIT-2	<ul style="list-style-type: none"> ➤ Permutation <ul style="list-style-type: none"> ▪ Formula ▪ Examples ➤ Combination <ul style="list-style-type: none"> ▪ Formula ▪ Relation of combination and permutations ▪ Examples. 	25%	12.5Marks
UNIT-3	<ul style="list-style-type: none"> ➤ Elementary theory of probability <ul style="list-style-type: none"> ❖ Some important terms <ul style="list-style-type: none"> ▪ Random experiment, Sample space, Event, Mutually exclusive events, Exhaustive events. Equally likely events. Independent events. ▪ Mathematical definition of probability with its limitations ▪ Statistical definition of probability with its limitations ▪ Axiomatic definition of probability. ▪ Addition law. ▪ Conditional probability ▪ Multiplicative law. ▪ Examples. 	30%	15 Marks
UNIT-4	<ul style="list-style-type: none"> ➤ Mathematical expectations and moments. <ul style="list-style-type: none"> ▪ Definition of mathematical expectations. ▪ Properties of mathematical expectations. ➤ Moments of random variables <ul style="list-style-type: none"> ▪ Raw moments ▪ Central moments ▪ Relation of central moments with raw moments. ▪ Coefficient of skewness. ▪ Coefficient of Kurtosis. 	20%	10Marks
References:-	1. I.Gupta S.P.(2006) Statistical Methods 34 th Edition S. Chand & Sons., New Delhi.		
	2. P.G.Hoel Statistical Methods 34 th Edition S. Chand & Sons., New Delhi.		
	3. Goon A.M. , Gupta M.K. and Dasgupta B.(2000) Fundamental of Statistics, Vol-I & II, 8 th Edn.. The world Press, Kolkata.		
	4. D.N.Elhance, Veena Elhance. Fundamental of Statistics.		
	5. S.P.Gupta & V.K. Kapoor. Fundamental of Mathematical Statistics : S. Chand & Co. New Delhi.		

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	6. D.C.Sancheti, V.K. Kapoor. Statistics.		
	7. Mood, Graybill and Boes (2007) Introduction to the theory of Statistics, 3 rd Edn,(Reprint), Tata Mcgraw hill Pub. Co. Ltd.		
	8. Pavate D.C. Bhagwat The Element Calculus.		
	9. Prof H.D. Shah. ગાણિતિક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ - અમદાવાદ, ગુજરાત.		
	10. M.C.Jayswal(1974) અર્થ વિષયક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ - અમદાવાદ, ગુજરાત.		
	11. Shantinakaran : " Text Book of Matrices".		
	12. D.C. Sancheti and V.K. Kapoor: 'Statistics(Theory, methods and application)" Sultan Chand Publication.		
	13B.J Venkatachella Functional Equations		
	14. Karmel P.H Applied Statistics for Economics.		
	15. Sancheti and V.K.Kapoor Mathematical Statistics.		

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A. SEMESTER -II

SYLLABUS OF

STATISTICS-IV(Major)-Credit-4

As per NEP-2020

To be Implemented from the academic year 2023-24

On completion of the course, the student will be able to:			
CO1	The binomial distribution is used to obtain the probability of observing x successes in N trials, with the probability of success on a single trial denoted by p. The binomial distribution assumes that p is fixed for all trials.		
CO2	Use a Poisson distribution to predict or explain the number of events occurring within a given interval of time or space.		
CO3	The Normal distribution is used to analyze data when there is an equally likely chance of being above or below the mean for continuous data whose histogram fits a bell curve.		
CO4	Use of demand and supply data to calculate equilibrium price and quantity		
OBJECTIVES			
<p>Students acquaint use of binomial distribution in the field of drugs and medicine. Whenever a new drug is invented to cure a particular disease, the effectiveness of the drug can be represented by two outcomes, i.e., whether the drug cures the disease or it does not.</p> <p>Students acquaint that Poisson distribution is a discrete probability distribution that expresses the probability of a given number of events occurring in a fixed interval of time or space if these events occur with a known constant rate and independently of the time since the last event.</p> <p>Students acquaint that the normal distribution is widely used in statistical inference and data analysis due to its many desirable properties.</p> <p>Students acquaint that demand, supply, cost, revenue and profit functions are widely used to solve problems of economics, social science and industrial problems.</p> <p>Students acquaint that vital statistics and life table are applicable in life insurance and general insurance for calculation of premium, risk and profit for various policies.</p>			
UNIT-1	<ul style="list-style-type: none"> ➤ Discrete probability distributions <ul style="list-style-type: none"> ▪ Binomial distribution ▪ Properties of binomial distribution. ▪ Examples ▪ Poisson distribution. ▪ Properties of Poisson distribution. ▪ Examples. ➤ Continuous Probability distribution. <ul style="list-style-type: none"> ▪ Normal distribution. ▪ Properties of Normal distribution. 	30%	15Marks
UNIT-2	<ul style="list-style-type: none"> ➤ Demand <ul style="list-style-type: none"> ▪ Meaning of demand ▪ Assumptions of demand function. 	30%	15 Marks

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	<ul style="list-style-type: none"> ▪ Graphical representation of demand curve. ▪ Price elasticity of demand. ▪ Interpretation of elasticity of demand. <p>➤ Supply</p> <ul style="list-style-type: none"> ▪ Assumptions of supply function. ▪ Graphical representation of supply curve. ▪ Price elasticity of supply. ▪ Interpretation of elasticity of supply. ▪ Market equilibrium. <p>➤ Revenue, Cost and profit function.</p> <ul style="list-style-type: none"> ▪ Procedure for maximization of revenue and profit function. ▪ Procedure for minimization of cost function. 		
UNIT-3	<p>➤ Vital Statistics.</p> <ul style="list-style-type: none"> ▪ Meaning of vital statistics. ▪ Uses of vital statistics. ▪ Measurement of mortality. <p>➤ Crude Death rate</p> <ul style="list-style-type: none"> ▪ Merits and demerits of Crude death rate <p>➤ Specific Death rate.</p> <p>Merits and demerits of Specific Death rate.</p>	20%	10 Marks
UNIT-4	<p>➤ Fertility rate</p> <ul style="list-style-type: none"> ▪ General fertility rate (GFR) ▪ Specified fertility rate. (SFR) ▪ Total fertility rate.(TFR) ▪ Examples. <p>➤ Reproduction rates.</p> <ul style="list-style-type: none"> ▪ Net reproduction rate (NRR) ▪ Gross reproduction rate (GRR) ▪ Examples. <p>➤ Life table</p> <ul style="list-style-type: none"> ▪ Definition ▪ Uses. ▪ Limitations ▪ Examples. 	20%	10 Marks

References.

1.	Gupta S.P.(2006)	Statistical Methods 34 th Edition S. Chand & Sons.. New Delhi.
2.	P.G.Hoel	Elements of statistics.
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II, 8 th Edn.. The world Press, Kolkata.
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9.	Karmel P.H.(1963)	Applied Statistics for Economics, 2 nd ed.
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11.	M.C.Jayswal(1974)	અર્થ વિષયક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ – અમદાવાદ, ગુજરાત.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A. SEMESTER -II

SYLLABUS OF STATISTICS-II(Minor)

Mathematical Statistics & Probability-Credit-4

As per NEP-2020

To be Implemented from the academic year 2023-24

On completion of the course, the student will be able to:			
CO1	They will identify independent and dependent variables and establish mathematical relation.		
CO2	Understand use of appropriate method of interpolation for a given values of independent variables for equal intervals and estimate value of dependent variable.		
CO3	Understand use of appropriate method of interpolation for a given values of independent variables for un-equal intervals and estimate value of dependent variable.		
CO4	Permutation is used for the list of data (where the order of the data matters)		
CO5	Combination is used for the list of data (where the order of the data no matters)		
CO6	Be familiar with some basic concepts of probability Distinguish between random and non-random experiments; Understand axioms of probability and various theorems on probability; Find the probabilities of various events. Understand the concepts of conditional probability and independence of events		
OBJECTIVES			
<ul style="list-style-type: none"> ❖ Use of various methods of interpolation for a given values of independent variables for equal intervals and able to estimate the value of dependent variable. ❖ Use of various methods of interpolation for a given values of independent variables for un equal intervals and able to estimate the value of dependent variable. ❖ Permutations are studied in almost every branch of mathematics. They also appear in many other fields of science. In computer science they are used for analyzing sorting algorithms, in quantum physics for describing states of particles and in biology for describing RNA sequences. ❖ Combinations are studied It also appear in many other fields of science. In computer science they are used for analyzing sorting algorithms, in quantum physics for describing states of particles, and in biology and useful for solving real life problems. ❖ Able to find probabilities of various events which are from daily life problems, social science problems, industrial problems Etc. 			
UNIT-I	<ul style="list-style-type: none"> ➤ Definition of interpolation <ul style="list-style-type: none"> ▪ Assumptions ▪ Uses ➤ Interpolation for equal intervals <ul style="list-style-type: none"> ▪ Newton's forward difference interpolation 	25%	12.5Marks

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	<ul style="list-style-type: none"> formula(without proof) <ul style="list-style-type: none"> ▪ Newton's backward difference interpolation formula (without proof) ▪ Binomial expansion (without proof) ▪ Examples. ➤ Interpolation for unequal intervals. <ul style="list-style-type: none"> ▪ Lagrange's interpolation formula. (without proof) ▪ Examples. 		
UNIT-2	<ul style="list-style-type: none"> ➤ Permutation <ul style="list-style-type: none"> ▪ Formula ▪ Examples ➤ Combination <ul style="list-style-type: none"> ▪ Formula ▪ Relation of combination and permutations ▪ Examples. 	25%	12.5Marks
UNIT-3	<ul style="list-style-type: none"> ➤ Elementary theory of probability <ul style="list-style-type: none"> ❖ Some important terms <ul style="list-style-type: none"> ▪ Random experiment, Sample space, Event, Mutually exclusive events, Exhaustive events, Equally likely events, Independent events. ▪ Mathematical definition of probability with its limitations ▪ Statistical definition of probability with its limitations ▪ Axiomatic definition of probability. ▪ Addition law. ▪ Conditional probability ▪ Multiplicative law. ▪ Examples. 	30%	15 Marks
UNIT-4	<ul style="list-style-type: none"> ➤ Mathematical expectations and moments. <ul style="list-style-type: none"> ▪ Definition of mathematical expectations. ▪ Properties of mathematical expectations. ➤ Moments of random variables <ul style="list-style-type: none"> ▪ Raw moments ▪ Central moments ▪ Relation of central moments with raw moments. ▪ Coefficient of skewness. ▪ Coefficient of Kurtosis. 	20%	10Marks

Reference Books

1.	Gupta S.P.(2006)	Statistical Methods 34 th Edition S. Chand & Sons., New Delhi.
2.	P.G.Hoel	Elements of statistics.
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II, 8 th Edn.. The world Press, Kolkata.
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10.	Prof H.D. Shah.	ગાણિતિક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ - અમદાવાદ, ગુજરાત.
11.	M.C.Jayswal(1974)	અર્થ વિષયક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ - અમદાવાદ, ગુજરાત.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A.

SEMESTER -II

SYLLABUS OF

STATISTICS (Multidisciplinary)

Measures of Statistics.

Credit-4

As per NEP-2020

To be Implemented from the academic year 2023-24

	On completion of the course, the student will be able to:
CO1	Understand the meaning measures of central tendency.
CO1	State the need for summarizing a set of data by a single number;
CO2	Communicate statistical concepts of measures of central tendency to non-statisticians.
CO3	Know the limitations of average;
CO4	Study the need of measures of dispersion; Understand various types of measures of dispersion.
CO5	Obtain the measures and then compare them;
CO6	Differentiate between absolute and relative measures.
OBJECTIVES	
The main objective of this course is to acquaint students to study various types of measures of central tendency. Also learn the different types of measures of central tendency for different types of data and able to do analysis from it. Students are acquaint limitations of averages and to need the study of various measures of dispersion and compare them. Students can also compare two and more than two data using coefficient of variation.	

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UNIT-1	Measures of Central tendency. <ul style="list-style-type: none"> ➤ Meaning of central tendency <ul style="list-style-type: none"> • Arithmetic mean • Geometric mean • Harmonic mean • Weighted mean. • Median • Mode • Merits and demerits of different measures of central tendency. • Characteristics of good average. 	30%	15 Marks
UNIT-2	<ul style="list-style-type: none"> • Quartiles • Deciles • Percentiles. • Combined mean • Examples. 	20%	10 Marks
UNIT-3	Measures of Dispersion <ul style="list-style-type: none"> ➤ Meaning of dispersion. <ul style="list-style-type: none"> • Absolute and relative measures of dispersion. • Range • Quartile deviation. • Mean deviation (about mean, median, mode) 	25%	12.5 Marks
UNIT-4	<ul style="list-style-type: none"> • Standard deviation, variance • Coefficient of variation. • Merits and demerits of dispersion. 	25%	12.5 Marks

Reference Books

1.	Gupta S.P.(2006)	Statistical Methods 34 th Edition S. Chand & Sons.. New Delhi.
2.	P.G.Hoel	Elements of statistics.
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II, 8 th Edn.. The world Press, Kolkata.
4.	D.N.Elhance, Veena Elhance.	Fundamental of Statistics.
5.	S.P.Gupta & V.K. Kapoor.	Fundamental of Mathematical Statistics : S. Chand & Co. New Delhi.
6.	D.C.Sancheti, V.K. Kapoor.	Statistics.
7.	Mood, Graybill and Boes (2007)	Introduction to the theory of Statistics, 3 rd Edn,(Reprint), Tata Mcgraw hill Pub. Co. Ltd.
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12.	Hogg and Craige	Introduction to mathematical statistics.
13.	Stuart G. and Ord. J. K. (1991)	Advanced theory of statistics.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

F.Y.B.A. SEMESTER -II

SYLLABUS OF

(Statistics) (SEC)

Statistics for Social Science-II (Credit-2)

As per NEP-2020

To be Implemented from the academic year 2023-24

	On completion of the course, the student will be able to:		
	<p>Linear Correlation Analysis: After successfully completing this course, students will be able to:</p> <p>CO1: comprehend the meaning of the term 'correlation'; CO2: interpret the nature of relationship between two variables; CO3: compute correlation coefficient and interpret its value; CO4: critically examine the degree and direction of the relationships between two or more variables; CO5: understand applications of correlation theory in various fields, viz., agriculture, business, medical science, industry etc.</p>		
	OBJECTIVES		
	<ul style="list-style-type: none"> ❖ Interpret the nature of relationship between two variables. ❖ Understand applications of regression analysis in various fields, viz., agriculture, business, industry etc 		
UNIT I	Linear Correlation Analysis:	50%	25 Marks
	<ul style="list-style-type: none"> ➤ Meaning, Definition and Types of correlation, ➤ Methods of studying correlation: <ul style="list-style-type: none"> (i) Scatter diagram method (with merits and limitations). (ii) Karl Pearson's product moment method (with merits and limitations), and 		

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	(iii) Spearman's Rank Correlation method (with derivation, merits and limitations). ➤ Interpretation correlation coefficient, ➤ Properties, ➤ Problems of above topics.		
UNIT 2	Linear Regression Analysis:	50%	25 Marks
	➤ Meaning, Definition, ➤ Fitting regression lines by principle of least squares, ➤ Regression coefficients and their properties, ➤ Angle between two lines of regression and its interpretation, ➤ Coefficient Determination, ➤ Utility of study of regression, ➤ Problems of above topics.		
Reference Books			
1.	Gupta S.P.(2006)	Statistical Methods 34 th Edition S. Chand & Sons., New Delhi.	
2.	P.G.Hoel	Elements of statistics.	
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II, 8 th Edn.. The world Press, Kolkata.	
4.	D.N.Elhance, Veena Elhance.	Fundamental of Statistics.	
5.	S.P.Gupta & V.K. Kapoor.	Fundamental of Mathematical Statistics : S. Chand & Co. New Delhi.	
6.	D.C.Sancheti, V.K. Kapoor.	Statistics.	
7.	Mood, Graybill and Boes (2007)	Introduction to the theory of Statistics, 3 rd Edn.(Reprint), Tata Mcgraw hill Pub. Co. Ltd.	
8.	Prof H.D. Shah.	ગાણિતિક આંકડાશાસ્ત્ર, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ -- અમદાવાદ, ગુજરાત.	

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT**

**F.Y.B.A. SEMESTER –II
SYLLABUS OF STATISTICS (VAC)**

Descriptive Statistics.

Credit-2

As per NEP-2020

To be Implemented from the academic year 2023-24

On completion of the course, the student will be able to:			
CO1: Introduction to times series data, application of time series to various fields, Components of a times series, measurement of trend by various methods. CO2: understand Seasonal Component: Estimation of seasonal component.			
OBJECTIVES			
Students can acquainted use of time series analysis in statistics, signal processing, pattern recognition, econometrics, mathematical finance, weather forecasting, earthquake prediction, lectroencephalography, control engineering, astronomy, communications engineering, and in applied science and engineering.			
UNIT-1	Time Series: Introduction to times series data. Components of a times series. ➤ Measurement of Trend: ○ Graphical method. ○ Method of semi averages. ○ method of moving averages. ○ method of curve fitting: ▪ Fitting of straight line by method of least Squares. ▪ fitting second degree parabolic Trend ▪ Fitting Exponential curve. ▪ Growth curve and their fitting	50%	25 Marks
UNIT-2	➤ Seasonal Component: • Estimation of seasonal component by Method of simple averages • Ratio to Trend, • Method of moving average	50%	25 Marks
Reference Books			
1.	Gupta S.P.(2006)	Statistical Methods 34 th Edition S. Chand & Sons., New Delhi.	
2.	P.G.Hoel	Elements of statistics.	
3.	Goon A.M. , Gupta M.K. and Dasgupta B.(2000)	Fundamental of Statistics, Vol-I & II, 8 th Edn.. The world Press, Kolkata.	
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