The overall program is divided into eight papers, with four papers in each Semester.

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SEMMESTER I

Paper - I Descriptive Statistics I (M. Marks: 100)

1. The thrust of the paper is on basic concepts and applications of statistics and not on mathematical derivations.

2. The paper is divided into two Units.

3. The question paper will have 9 questions carrying equal marks. The candidate will be required to attempt five questions including the first compulsory question and two questions out of four questions from each unit, in three hours duration. The compulsory question shall consist of short answer type questions covering the whole syllabus with no internal choice.

4. The students are allowed to use electronic calculators with four basic Mathematical operations and up to one memory.

5. The distribution of 100 marks is as follows:

Final Examination: 80 marks
Internal Assessment: 20 marks

Objective: The objective of the course is to make the students conversant with various techniques used in summarization and analysis of data.

UNIT –I


UNIT –II

Measures of variation: range, quartile deviation, mean deviation, variance and standard deviation, Coefficient of Variation. Central and Non-Central Moments. Measures of skewness: Karl Pearson’s, Bowley’s and Coefficient of skewness based on moments, Box and Whisker Plot. Measure of kurtosis based on moments.

References:

   B. Dasgupta (2013)

Paper - II Probability and Sampling Distributions (M. Marks: 100)

1. The thrust of the paper is on basic concepts and applications of statistics and not on
classical derivations.

2. The paper is divided into two Units.

3. The question paper will have 9 questions carrying equal marks. The candidate will be required
to attempt five questions including the first compulsory question and two questions out of four
questions from each unit, in three hours duration. The compulsory question shall consist of
short answer type questions covering the whole syllabus with no internal choice.

4. The students are allowed to use electronic calculators with four basic Mathematical operations
and up to one memory.

5. The distribution of 100 marks is as follows:

**Final Examination: 80 marks**
**Internal Assessment: 20 marks**

Objective: This course will lay the foundation to probability theory of outcomes of real life random
experiments through various Statistical distributions.

**UNIT-I**

Probability: Random experiments, sample space, events. Mutually exclusive events, exhaustive
events, complementary events, equally likely events, independent and dependent events, exhaustive
events.Classical, statistical (empirical) and axiomatic approaches to probability. Additive and
multiplicative laws of probability, conditional probability, partition of sample space, theorem of total
probability and Bayes' theorem. Discrete and continuous random variables and their probability
functions.Mathematical expectation.

**UNIT-II**

Theoretical distributions: Bernoulli, Binomial, Poisson, Normal, Uniform Exponential, Gamma
Geometric, Hyper Geometric and their properties and applications. Sampling distributions associated
with normal distribution (Chi-square, t and F). Law of large numbers and central limit theorem
(definitions and applications only).

**References :**

               IBH Publishers
               B. Dasgupta (2013)
Paper - III  Basic Business Statistics (M. Marks: 100)

1. The thrust of the paper is on basic concepts and applications of statistics and not on mathematical derivations.
2. The paper is divided into two Units.
3. The question paper will have 9 questions carrying equal marks. The candidate will be required to attempt five questions including the first compulsory question and two questions out of four questions from each unit in three hours duration. The compulsory question shall consist of short answer type questions covering the whole syllabus with no internal choice.
4. The students are allowed to use electronic calculators with four basic Mathematical operations and up to one memory.
5. The distribution of 100 marks is as follows:

   Final Examination: 80 marks
   Internal Assessment: 20 marks

Objective: The paper introduces the applications of Statistics to maintain quality in Engineering or industrial set up. The theory of control charts and sampling plans is dealt with.

UNIT-I

Index Numbers: Purpose of the index numbers, problems in the construction of index numbers. Construction of index numbers: un-weighted and weighted aggregate methods and method of weighted averages of price relatives. Chain index numbers. Conversion of fixed base to chain base index numbers and vice versa. Tests for Index numbers. Cost of living index numbers. Splicing and deflating of index number series

UNIT-II


References:

Paper - IV Research Methods (M. Marks: 100)

1. The thrust of the paper is on basic concepts and applications of statistics and not on mathematical derivations.

2. The paper is divided into two units.

3. The question paper will have 9 questions carrying equal marks. The candidate will be required to attempt five questions including the first compulsory question and at least one out of three from Unit-I and at least two out of five questions from Unit-II, in three hours duration. The compulsory question shall consist of short answer type questions covering the whole syllabus with no internal choice.

4. The students are allowed to use electronic calculators with four basic Mathematical operations and up to one memory.

5. The distribution of 100 marks is as follows:

   **Final Examination: 80 marks**
   **Internal Assessment:20 marks**

**Objective:** The objective of this course is to provide an introduction to research and to acquaint the students about the need & merits of sampling over census and the implementation of various sampling schemes.

**UNIT-I**

Introduction to Research : meaning of research, types of research, role of research, characteristics of interest in research. Process of research, report writing and presentation.Use of statistical packages (Excel, Minitab, SPSS) in research.

**UNIT-II**


**References:**


4. Hurbet M. Blalock (Jr.) (1979). *Social Statistics*


SEMESTER II

Paper - V Descriptive Statistics II (M. Marks: 100)

1. The thrust of the paper is on basic concepts and applications of statistics and not on mathematical derivations.

2. The paper is divided into two Units.

3. The question paper will have 9 questions carrying equal marks. The candidate will be required to attempt five questions including the first compulsory question and two questions out of four questions from each unit, in three hours duration. The compulsory question shall consist of short answer type questions covering the whole syllabus with no internal choice.

4. The students are allowed to use electronic calculators with four basic Mathematical operations and up to one memory.

5. The distribution of 100 marks is as follows:

   **Final Examination: 80 marks**
   **Internal Assessment:20 marks**

**Objective:** The objective is to introduce methods for relating two or more variables. The students will get familiar with the need of modeling random responses using independent predictors through linear models in real life situations. Vital statistics shall cover measures of mortality and fertility.

**UNIT-I**

Correlation Analysis: Methods of studying simple correlation: scatter diagram, Karl Pearson's co-efficient of correlation, Spearman's rank correlation, Kendall’s Tau. Multiple and partial correlation, Correlation ratio and intra-class correlation.


**UNIT-II**


**References :**


Paper –VI Testing of Hypotheses (M. Marks: 100)

1. The thrust of the paper is on basic concepts and applications of statistics and not on mathematical derivations.

2. The paper is divided into two Units.

3. The question paper will have 9 questions carrying equal marks. The candidate will be required to attempt five questions including the first compulsory question and two questions out of four questions from each unit in three hours duration. The compulsory question shall consist of short answer type questions covering the whole syllabus with no internal choice.

4. The students are allowed to use electronic calculators with four basic Mathematical operations and up to one memory.

5. The distribution of 100 marks is as follows:
   - **Final Examination**: 80 marks
   - **Internal Assessment**: 20 marks

Objective: The objective of this course is to apprise the students about various techniques of hypothesis testing with the assumptions of parametric set up and also non-parametric set up.

UNIT-I

Tests of Significance: Statistical hypotheses. Type-I and Type-II errors, level of significance, tests of significance for the parameters of the normal distribution (one sample and two samples). Approximate tests concerning proportion, difference of two proportions. Chi-square tests for goodness of fit and independence of attributes. Test for the significance of observed correlation coefficient.

UNIT-II


References:


Paper VII. - Times Series Analysis and Design of Experiments (M. Marks: 100)

1. The thrust of the paper is on basic concepts and application of statistics and not on mathematical derivations.

2. The paper is divided into two units.

3. The question paper will have 9 questions carrying equal marks. The candidate will be required to attempt five questions including the first compulsory question and two questions out of four questions from each unit, in three hours duration. The compulsory question shall consist of short answer type questions covering the whole syllabus with no internal choice.

4. The students are allowed to use electronic calculators with four basic Mathematical operations and up to one memory.

5. The distribution of 100 marks is as follows:

   **Final Examination: 80 marks**
   **Internal Assessment: 20 marks**

**Objective:** The objective is to provide an exposure to Time series for predicting future values based on previously observed values. An orientation of statistics while designing statistical experiments, particularly in agricultural set up and in pharmaceutical production processes shall be introduced.

**UNIT-I**


**UNIT-II**

Design of Experiments. Analysis of variance: one way and two-way classifications. Principles of design of experiments. Completely randomized design, randomized complete block design and Latin square design: their layouts, analysis of variance tables and applications.

**References:**

Paper - VIII  Research Project (Dissertation) (M. Marks: 100)

1. The thrust of the Dissertation-based paper is to give an opportunity to the students to have a first-hand experience of data collection, compilation, analysis and report writing.

2. A list of suggested topics etc. for the Projects shall be provided to the students at the time of enrolment. However, they will be encouraged to undertake Project related to their professional placement.

3. They will execute the Project under the guidance of a member of the Faculty in University/College who is Ph.D. and has at least three research papers to his credit.

4. The project has to be submitted as per the date finalised by the USOL in consonance with the University Admission and Examination schedule.

The distribution of 100 marks is as follows:

**Project Report: 50 marks**
**Viva: 50 marks**