**P.R.GOVERNMENT COLLEGE (A), KAKINADA**

**I B.Sc. – Statistics / Semester- I (2018-2019)**

**Paper-I**

**Course: DESCRIPTIVE STATISTICS & PROBABILITY**

**Total Hrs. of Teaching: 52 @ 4 h / Week Total Credits: 03**

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**Objective: Descriptive statistics** is the discipline of quantitatively describing the main features of a collection of information, or the quantitative description itself. Descriptive statistics are distinguished from [inferential statistics](http://en.wikipedia.org/wiki/Statistical_inference), in that descriptive statistics aim to summarize a [sample](http://en.wikipedia.org/wiki/Sample_%28statistics%29), rather than use the data to learn about the [population](http://en.wikipedia.org/wiki/Statistical_population) that the sample of data is thought to represent. This generally means that descriptive statistics, unlike inferential statistics, are not developed on the basis of [probability theory](http://en.wikipedia.org/wiki/Probability_theory). Even when a data analysis draws its main conclusions using inferential statistics, descriptive statistics are generally also presented.

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**Module -1 (12h)**

**Descriptive Statistics:**

Concept of primary and secondary data, methods of collection and editing of primary data-

Designing a questionnaire and a schedule- Sources and editing of secondary data-

 Measures of central tendency with simple applications with real life examples.

**Module-2 (12h)**

**Measures Of Dispersion, Skewness & Kurtosis:**

Importance of moments, central and non-central moments, and their interrelationships**-**Sheppard’s corrections for moments for grouped data. **-**Measures of skewness based on quartilesand moments and kurtosis based on moments.

**Module-3 (13h)**

**Probability**:

Basic concepts in probability-Mathematical, statistical and axiomatic definitions of probability

-Conditional probability and independence of events- Addition and multiplication theorems for n events-

Boole’s inequality and Bayes’ theorem- Problems on probability using counting methods and theorems**.**

**Module-4 (15h)**

**Random Variables**:

Definition of random variable-functions of random variables with illustrations- Distribution function (Uni and Bivariate) and its properties-Transformation of one-dimensional random variable (simple 1-1 functions only)-Notation of bivariate random variable-Joint, marginal and conditional distributions. Independence of random variables**.**

**List of Text Books:**

 1.V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan

 Chand&Sons, New Delhi

 **List of reference Books:**

1. Goon AM, Gupta MK,Das Gupta B : Outlines of Statistics , Vol-II, the World Press

 Pvt.Ltd., Kolakota.

 2. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.

 3. Sanjay Arora and BansiLal:New Mathematical Statistics SatyaPrakashan, New Delhi.

**SEMESTER-I: DISCRIPTIVE STATISTICS**

 **Model blue print for the Question Paper setter**

**Max. marks: 60 Time: 2 ½ Hrs.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Unit / Chapter name** |  | **Short Answer Questions** | **Essay Questions** | **Marks allotted to the Unit/Chapter** |
| **Unit - 1** |
| **Descriptive Statistics** |  | **2** | **2** | **30** |
| **Unit - 2** |
| **Dispersion , Skewness & Kurtosis** |  | **1** | **2** | **25** |
| **Unit - 3** |
| **Probability**:  |  | **2** | **2**  | **30** |
| **Unit - 4** |
| **Random Variables**: |  | **1** | **2** | **25** |
| **Any of the above Units (i.e., 1-4)** |
| - |  |  |  |  |
| **Total No. of Questions including choice (14)** |  | **6** | **8** | **-** |
| **Total marks allotted to all questions including choice =** | **110** |

**P.R. Government College (Autonomous), Kakinada**

**I year B.Sc., Degree Examinations – Semester-I**

**Statistics Paper–I: DISCRIPTIVE STATISTICS & PROBABILITY**

**Model Paper**

**Time: 2 ½ Hrs. Max. Marks: 60**

  **Section – A**

 **Answer any four of the following questions. 4x5 = 20 M**

1. Explain about the primary and secondary Data.
2. Show that the sum of absolute deviation from median is minimum.
3. What is dispersion. Explain mean deviation and standard deviation.
4. What is the chance that leap year selected at random will contain 53 Sundays.
5. A problem in statistics is given to the three students A,B and C whose chances of

 solving it are 1/2, 3/4 and 1/4 respectively. What is the probability that the problem will be solved it all of them solve independently.

1. For a continuous random variable X with p.d.f. f(x)=3x2 ,0≤ x ≤ 1. Find a and b such

 that i) p(X ≤ a) = p(X>a) and ii)p(X>b)=0.05

**Section – B**

**Answer any two questions 2x10 = 20 M**

1. Distinguish between questionnaire and schedule? Prepare a questioner for conducting a survey of a population profile of a region?
2. Explain measures of central tendency with their relative merits and demerits?
3. Define raw and central moments and establish relationship between them?

 10. For the following data compute β1 andβ2 ?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| CI | 0-5 | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 |
| F | 2 | 6 | 8 | 10 | 8 | 6 | 2 |

**Section – C**

 **Answer any two questions 2x10 = 20 M**

11.State and prove additive law of probability of n events.

12. State and prove Baye’s theorem probability.

13.A random variable X lies the following probability distributions

 X: 0 1 2 3 4 5 6 7 8

 P(X): a 3a 5a 7a 9a 11a 13a 15a 17a

 Find the values of a)a b) p(X<3) c)p(X≥3) d)p(0<X<5) e)p(X≤7)

14. Define i) Probability density function

 ii) Distribution function.

Suppose that the random variables X takes the values 3,4 and 5 with probabilities 1/2 , 1/6 and

1/3 respectively. Obtain distribution function of the random variable X.