DEPARTMENT OF STATISTICS
AGENDA OF THE MEETING
MONDAY 29.08.16

1.1   Welcome address by the chair.

1.2   Details of choice base credit system.

1.3   Discussion on Common Core Syllabus.

1.4   Marks allotted for Internal and end Semester exams.

1.5   Discussion on Semester Exam, Semester Exam Model Paper & Internal Exam Model Paper

1.6   Discussion on Practical Exam Model Paper

1.7   Panel of Examiners

1.8   Any other matter

1.9   Vote of Thanks

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
BOARD OF STUDIES
DEPARTMENT OF STATISTICS

Chairperson
Mrs. M. Anitha
Head – Department of Statistics
Hindi Mahavidyalaya
Nallakunta, Hyderabad.

University Nominee
Prof. V. V. Hara Gopal
Ex-Officio Member – BOS
Department of Statistics
Osmania University, Hyderabad.

Members of BOS

1. Dr. C. Jayalakshmi
   Department of Statistics
   Osmania University, Hyderabad

2. B. Bhargavi
   Head - Department of Statistics
   Andhra Mahila Sabha Arts & Science College
   Osmania University, Hyderabad

3. Dr. N. Balakrishna (NIN)
   Hyderabad

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD (AUTONOMOUS)

COMPOSITION OF THE BOARD OF STUDIES IN AN AUTONOMOUS COLLEGE

I. **Composition: Department of Statistics**

1. Head of the department concerned (Chairperson)

     Mrs. M. Anitha , Head – Department of Statistics

2. The entire faculty of each specialization.

     Mrs. M. Anitha

3. One expert to be nominated by the vice-chancellor from a panel if six recommended by the College Principal.

     1. Prof. V. V. Hara Gopal, Ex-Officio Member – BOS, Department of Statistics.

4. Two experts in the subject from outside the college to be nominated by the Academic Council.

     1. Dr. C. Jayalakshmi, Department of Statistics, Osmania University, Hyderabad
     2. B. Bhargavi, Head-Department of Statistics, Andhra Mahila Sabha Arts & Science College, Osmania University, Hyderabad.

(a) Experts from outside the College whenever special courses of studies are to be formulated-To be nominated.

1. Dr. N. Balakrishna (NIN) Hyderabad

(b) Other members of staff of the same faculty.

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc. 1st Year Statistics
Semester – 1
Paper I

Code:
Instruction
Theory Classes   4 Hrs/Week
Credit for Theory   4
Duration of Semester Examination   21/2 Hrs
Duration of Internal Examination   1 Hr
Semester Examination Marks   80 Marks
Internal Examination Marks   20 Marks

Descriptive Statistics and Probability (DSC-2A)

Unit –I

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. Classification and tabulation of data.Measures of central tendency (mean, median, mode, geometric mean and harmonic mean) with simple applications.Absolute and relative measures of dispersion (range, quartile deviation, mean deviation and standard deviation) with simple applications.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 with real life examples.

UNIT-II

Probability: Basic concepts in probability—deterministic and random experiments, trail, outcome, sample space, event, and operations of events, mutually exclusive and exhaustive events, and equally likely and favourable outcomes with examples. Mathematical, statistical and axiomatic definitions of probability with merits and demerits. Properties of probability based on axiomatic definition. 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.

UNIT-III

Random Variables: Definition of random variable, discrete and continuous random variables, functions of random variables, probability mass function and probability density function with illustrations. Distribution function and its properties.Transformation of one-dimensional random variable (simple 1-1 functions only).Notion of bivariate random variable, bivariate distribution and statement of its properties.Joint, marginal and conditional distributions.Independence of random variables.

UNIT-IV

Mathematical Expectation: Mathematical expectation of a function of a random variable. Raw and central moments and covariance using mathematical expectation with examples.
Addition and multiplication theorems of expectation.Definition of moment generating function (m.g.f), cumulant generating function (c.g.f), probability generating function (p.g.f) and characteristic function (c.f) and statements of their properties with applications.Chebyshev's , and Cauchy-Schwartz's inequalities and their applications.

29/08/2016

CHAIRMAN,
Board of Studies
In Statistics O.U.

Associate Professor
DEPARTMENT OF STATISTI
Osmania Univer
HYDERABAD-500 007

N.

DEPARTMENT OF STATISTIC
Osmania University,
HYDERABAD-500007. INDIA

B.Bhargavi

List of reference books:

1. Charles M.Grinstead and Laurie Snell,J:Introduction to Probability,American Mathematical Society
2. Willam Feller: Introduction to Probability theory and its applications. Volume –I,Wiley

3. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand&Sons, New Delhi
4. GoonAM,GuptaMK,Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd.,Kolakota.
5. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.
6. M.JaganMohan Rao and Papa Rao: A Text book of Statistics Paper-I.
7. Sanjay Arora and BansiLal:.New Mathematical Statistics : Satya Prakashan , New Delhi
8. Hogg.Tanis.Rao: Probability and Statistical Inference. 7th edition. Pearson
9. SambhavyataAvadhiSiddantalu—TeluguAcademy
10. Sahasambandham-VibhajanaSiddantamulu – TeluguAcademy
11. K.V.S. Sarma: Statistics Made Simple: do it yourself on PC. PHI
12. Gerald Keller: Applied Statistics with Microsoft excel. Duxbury, Thomson Learning.
13. Levine, Stephen, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel 4th edition. Pearson Publication.
14. Abraham Kendall and Baker: Discrete Mathematics for Computer Science.

29/08/2016

CHAIRMAN,
Board of Studies
in Statistics O.U.

B.Bhargavi

29/8/2016

DEPARTMENT OF STATISTIC
Osmania University,
HYDERABAD-500007 INDIA

Osmania University,
HYDERABAD-500007, INDIA

2

B.Sc Statistics Ist Year

Semester - I

Paper-I: Descriptive statistics and probability

Theory Model Question Paper

Max. Marks: 80

Time: 2 ½ hrs

SECTION - A

4 X 5 = 20 Marks

I Write any Four questions:

1. What are the differences between questionnaire and schedule?

2. What do you mean by skewness and kurtosis?

3. Give mathematical and axiomatic definitions of probability.

4. State and prove Baye's theorem.

5. Define distribution function and state its properties.

6. Define one-dimensional random variable. Write the procedure for transformation of one-dimensional random variable.

7. State and prove Chebyshev's inequality.

8. Define characteristic function and state its properties.

SECTION - B

4 X 15 = 60 Marks

II Answer all 4 Questions

I (a) Define primary data and secondary data with merits and demerits. Explain the methods of collecting primary data.

(OR)

(b) Define central and non-central moments. Establish the relationships between them.

II. (a). (i) Define mutually exclusive and exhaustive events.

(ii) State and prove addition theorem of probability for 'n' events.

(OR)

(b). (i) State and prove Boole's inequality.

(ii) If $P(A \cup B) = \frac{5}{6}$, $P(A \cap B) = \frac{1}{3}$ and $P(\bar{B}) = \frac{1}{2}$, Prove that the events A and B are independent.

III (a) Define random variable. A random variable 'X' has the following probability function.

X:	0	1	2	3	4	5	6	7
P(X):	0	k	2k	3k	k	k^2	$2k^2$	$7k^2+k$

Find (i). the value of K

    (ii). mean and variance

    (iii). Evaluate $P(X \geq 6)$, $P(X<6)$ and $P(0<X<5)$

    (iv). Distribution function.

(OR)

(b) Define probability density function. A continuous random variable 'X' has the following p.d.f

    $f(x) = A + Bx; 0 \leq X \leq 1$. If its mean is $\frac{1}{2}$ then

find (i). the values of A and B.

    (ii). variance of 'x'.

    (iii). Distribution function.

IV. (a) Define MGF and CGF of a random variable. State and prove their properties.

(OR)

(b) (i) State and prove multiplication theorem of expectation.

    (ii) State and prove Cauchy-Schwartz's inequality.

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc Statistics 1ˢᵗ Year
Semester - I
Paper-1
Practical Model Question Paper

Max. Marks: 45+5=50

Time: 2 hrs

Answer any two of the following:

I (a) The following is the frequency distribution of a diameter of 1000 parts of a particular type produced by the ABC Company Limited. Draw histogram to this data and superimpose frequency polygon over it. And hence extract the model value of the distribution.

Diameter in cms :	3.05-3.15	3.15-3.25	3.25-3.35	3.35-3.45
No. of parts:	13	29	65	200

Diameter in cms :	3.45-3.55	3.55-3.65	3.65-3.75	3.75-3.85	3.85-3.95
No. of parts:	278	296	74	40	5

(b) Given below is the recorded data on production from different sectors in four Countries:

Countries	Agriculture	Industry	Services	Others
India	45	49	28	8
America	13	35	61	11
Japan	16	48	43	13
England	13	40	44	16

Represent it by percentage bar diagram- country wise.

II Given below is frequency distribution of intelligence Quotient of 875 students:

Intelligence quotient	55-65	65-75	75-85	85-95	95-105	105-115	115-125	125-135	135-145
No. of students:	6	23	82	152	196	172	146	72	25

Compute Karl Pearson's and Bowley's coefficients of skewness and comment on your findings.

III Find the second, third and fourth central moments of the data given below. Hence find measure of skewness and Kurtosis. And apply Sheppard's corrections for moments.

C.I:	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f:	5	15	20	35	10	10	5

IV (a) Draw the ogives and hence estimate the median for the following frequency distribution:

Class:	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79
Frequency:	8	32	142	216	240	206	143	13

(b) The first four moments of a distribution about the value 5 of the variable are 2, 20, 40 and 50. Obtain, as far as possible, the various characteristics of the distribution on the basis of the information given and comment on your findings.

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc. 1ˢᵗ Year Statistics
Semester – II
Paper-II

Code:
Instruction
Theory Classes
Credit for Theory
Duration of Semester Examination
Duration of Internal Examination
Semester Examination Marks
Internal Examination Marks

4 Hrs/Week
4
21/2 Hrs
1 Hr
80 Marks
20 Marks

Probability Distributions (DSC-2B)

UNIT-I

Discrete distributions: Uniform, Bernoulli, Binomial, Poisson, Negative binomial, Geometric and Hyper-geometric (mean and variance only) distributions their applications and uses.

UNIT-II

Properties of these distributions such as m.g.f, c.g.f., p.g.f., c.f., and moments up to fourth order and their real life applications. Reproductive property wherever exists. Binomial approximation to Hyper-geometric, Poisson approximation to Binomial and Negative binomial distributions.

UNIT-III

Continuous distributions: Rectangular and Normal distributions. Normal distribution as a limiting case of Binomial and Poisson distributions. Exponential, Gamma, Beta of two kinds (mean and variance only) and Cauchy (definition and c.f. only) distributions.

UNIT-IV

Properties of these distributions such as m.g.f., c.g.f., c.f., and moments up to fourth order, their real life applications and reproductive property wherever exists.

Statement and applications of weak law of large numbers, Strong law of large numbers and central limit theorem for identically and independently distributed (i.i.d) random variables with finite variance.

V. V. Hav-Srwal   N. Bhikvishu
29/08/2016
CHAIRMAN
Board of Studies
In Statistics O.U.

B. Bhargavi

29/8/2018
Osmania University,
HYDERABAD-500007, INDIA
Associate Professor,
Department of Statistics,
Osmania University,
HYDERABAD-500007, INDIA.

List of reference books:

1. Willam Feller: Introduction to Probability theory and its applications. Volume –I,Wiley

2. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand&Sons, New Delhi

3. GoonAM,Gupta MK,Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd., Kolakota.

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

5. M.JaganMohan Rao and Papa Rao: A Text book of Statistics Paper-I.

6. Sanjay Arora and BansiLal:.New Mathematical Statistics : Satya Prakashan , New Delhi

7. Hogg.Tanis.Rao: Probability and Statistical Inference. 7th edition. Pearson

8. SambhavyataAvadhiSiddantalu—TeluguAcademy

9. Sahasambandham-VibhajanaSiddantamulu – TeluguAcademy

10. K.V.S. Sarma: Statistics Made Simple: do it yourself on PC. PHI

11. Gerald Keller: Applied Statistics with Microsoft excel. Duxbury, Thomson Learning.

12. Levine, Stephen, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel 4th edition. Pearson Publication.

13. Abraham Kendall and Baker: Discrete Mathematics for Computer Science.

14. Charles M.Grinstead and Laurie Snell,J:Introduction to Probability,American Mathematical Society

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc. 1st Year Statistics
Semester – II
Practical Paper- II

Code:

Instruction	2 Hrs / Week
Duration of Exam	2 Hrs
No. of Credits	2
Marks for Exam	50 Marks (45+5)
Laboratory Course	30 Hrs

1.   Fitting of Binomial distribution – Direct method.
2.   **Fitting of Binomial distribution – Direct method using MS Excel.**
3.   Fitting of binomial distribution – Recurrence relation Method.
4.   Fitting of Poisson distribution – Direct method.
5.   **Fitting of Poisson distribution – Direct method using MS Excel.**
6.   Fitting of Poisson distribution - Recurrence relation Method.
7.   Fitting of Negative Binomial distribution.
8.   Fitting of Geometric distribution.
9.   Fitting of Normal distribution – Areas method.
10. **Fitting of Normal distribution – Areas method using MS Excel**
11. Fitting of Normal distribution – Ordinates method.
12. Fitting of Exponential distribution.
13. **Fitting of Exponential distribution using MS Excel.**
14. Fitting of a Cauchy distribution.
15. **Fitting of a Cauchy distribution using MS Excel.**

V. V. Haveshwal   N. A. Vaishnu   29/8/2016
29/08/2016   DEPARTMENT OF STATISTIC
                                    Osmania University
                                    HYDERABAD-500007, INDIA
Board of Studies   B. Bhargavi   Associate Professor,
In Statistics O.U.   DEPARTMENT OF STATISTICS,
                                    Osmania University,
                                    HYDERABAD-500007, INDIA.

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc Statistics I Year
Semester - II
Paper - II
Theory Model Question Paper

Time: 2 ½ hrs   Max. Marks: 80

SECTION- A

Answer any Four questions: Marks: 4x5=20

1. Define Bernoulli distribution. Obtain Mean and Variance.
2. Define Discrete uniform distribution. Obtain Mean and Variance.
3. State and prove additive property of Binomial distribution.
4. Define Geometric distribution. Derive its moment generating function
5. Define Cauchy distribution, write its properties.
6. Write chief characteristics of normal distribution.
7. The mean and variance of a continuous uniform random variable 'x' are 1.5 abd 0.75 respectively. Obtain the probability density function of 'x'.
8. State weak law of large numbers.

SECTION -B

Answer all questions: Marks: 4x15=60

I (a) Define negative binomial distribution. Derive its mean and variance through expectation.

(OR)

(b) Define Hyper geometric distribution, give an example. Obtain its Mean and Variance.

II (a) (i) Define Bionomial distribution. Obtain movement generating function.

(ii) Prove that Bionomial distribution is the limiting case of Hypergeometric distribution by stating the Condition.

(OR)

(b) (i) Show that Poisson distribution satisfies the reproductive property.

(ii) The number of monthly breakdowns of the computer is a random variable "X" having a Poisson Distribution with mean 2. Find the probability that this computer will function for a month

(a) Without a breakdown   (b) With exact one breakdown

III (a) Define Standard normal distribution. Derive normal distribution is the limiting case of Poisson distribution.

(OR)

(b) (i) Define exponential distribution. Obtain its moment generating function.

(ii) State and prove its lack of memory property.

IV (a) Show that for a Normal distribution,

QD : MD : SD = 10 : 12 : 15

(OR)

(b) Define Beta distribution of 1st and 2nd kinds. Obtain Mean and Variance of these distributions.

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
B.Sc Statistics Ist Year
Semester - II
Paper-II
Practical Model Question Paper

Time: 2 hrs   Max. Marks: 45+5=50

Answer any two of the following:

I. A set of 8 symmetrical coins was tossed 256 times and the frequencies of throws observed were as follows:

No. of heads: 0   1   2   3   4   5   6   7   8

Frequecy of
throws: 2   6   24   63   64   50   36   10   1

Fit an appropriate distribution to the given data
Find Mean and standard deviation of fitted distribution.

II. Given below is the marks distribution of 350 students of UG standard in statistics:

Marks: 0-10 10-20 20-30 30-40 40-50 50-60 60-70 70-80 80-90 90-100
No. of parts: 5   18   32   45   57   63   52   39   25   14

Fit normal distribution by ordinates method.

III. (a). The following data give frequency of aircraft accidents experienced by 2546 pilots during a four-year period:

No. of accidents: 0   1   2   3   4   5
No. of pilots   :   2036   422   71   13   3   1

Fit poisson distribution by estimating 'λ'.

(b). Given the hypothetical distribution:

No. of cells (x):   0   1   2   3   4   5   Total
Frequencies(f):   213   128   37   18   3   1   400

Fit a negative binomial distribution and calculate the expected frequencies.

IV.(a). Fit exponential distribution for the following data: using MS- Excel

C.I :   0-2   2-4   4-6   6-8   8-10   10 and above
F :   122   48   19   7   3   2

(b). Fit Cauchy distribution to the following data: using MS - Excel.

C.I : -α to -29 -29 to -21 -21 to -13 -13 to -5 -5 to 3 3 to11 11 to19 19 to27 27 to35 35 to α
F :   12   10   20   38   40   32   20   10   8   0

V. V. Haveswal   N. S. L. Krishna   29/8/2016
29/08/2016   Usmo... HYDERABAD-500007 INDIA
CHA...   Associate Professor
Board of Studies   B. Bhargav   DEPARTMENT
Statistics O.U.   Osmania University

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
DEPARTMENT OF STATISTICS
BOARD OF STUDIES
Academic Year – 2016-17

Minutes of BOS Meeting

BOS meeting of the Department of Statistics was held on Monday , at 01:30 PM.

the following members were present

Prof. V. V. Hara Gopal	-	University Nominee
Mrs. M. Anitha	-	Chairperson
Dr. C. Jayalakshmi	-	Member
Dr. N. Balakrishna (NIN)	-	Member
B. Bhargavi	-	Member

(Signatures present: Board of Studies in Statistics O.U. 29/08/2016, DEPARTMENT OF STATISTICS, Osmania University, HYDERABAD-500007 IND)

1.1 Welcome address by the chair

The chair welcomed the University Nominee, Ex-officio Member BOS, O.U Department of Statistics and Members of B.O.S.

1.2 Details of choice based credit system.

Members were informed that TSCHE has referred that from the academic year 2016-17 autonomous institutions have to follow CBCS i.e. From the Academic Year 2016-17 Osmania University has instructed all the Degree colleges including Autonomous Degree colleges to follow CBCS under which after passing the exam student will get the Grade in the Final Result. 4 Credits are given for theory paper and 2 credits are given for practical in each semester.

1.3 Discussion and Distribution of Common Core Syllabus.

    i. Members were informed by the chair that Department of Statistics, Hindi Mahavidyalaya is following common core syllabus prescribed by Osmania University.

    ii. We are adopting Osmania University same syllabus of each Semester as it is without any changes

Syllabus copy for both the semesters is enclosed.
Syllabus was approved by the Member of BOS.

1.4   Marks allotted for Internal and end Semester exams.

1. Internal assessment is of 20 Marks. In each Semester two internal assessment of 20
   Marks each will be conducted and an average of both the internal assessments will be
   added in the marks of Theory exam.
2. Theory Question paper is of 80 marks.
3. Total allotted marks are 100.
The distribution of marks was approved by the Member of BOS.

1.5   Discussion on Pattern and Model Paper of Semester exam and Model Paper of
        Internal Exam

1. It was informed by the department that in each Semester Two Internal exams will be
conducted.
2. Semester exam will be conducted as per the Almanac which will be provided by the exam
branch. Internal exam duration will be 1 hour, and Semester exam duration will be of 21/2 hrs.
3. Model Question paper for Semester I and Semester II was discussed. Theory paper for each
Semester will have 2 sections.
i) Section A contains 8 short Questions. The student has to answer any four short questions.
Each Question carries 5 Marks (4X5=20)
ii)Section B contains 4 long answer type Questions with internal choice. Each Question carries
15 Marks (4X15=60)

Pattern of Model Question Papers for Paper I and Paper II are enclosed.
Pattern of Model Question Paper was approved by Member of BOS.

1.6   Discussion on Practical Exam Model paper.

It was decided in BOS meeting that 50 Marks Practical Exam will be held in each Semester and
2 credits will be given for Practical in each Semester.
The Practical model paper was approved by the Member of BOS.

1.7   Panel of Examiners

The panel of examiners was approved by the members.
List is enclosed

1.8   Any other matter.

Added one practical question in the syllabus and approved by BOS.

1.9   Vote of Thanks

Meeting concluded with the Vote of Thanks by Ms. M. Anitha.

Chairperson	University Nominee	Members	Principal

Mrs. M. Anitha
Head – Department of Statistics
Hindi Mahavidyalaya
Nallakunta, Hyderabad
	Prof. V. V. Hara Gopal
	Ex-Officio Member – BOS
	Department of Statistics
	Osmania University,
	Hyderabad.
	
	V. V. Hare Gopal
	CHAIRMAN, 29/08/2016
	Board of Studies
	in Statistics O.U.
		1.Dr. C. Jayalakshmi
		  Department of Statistics
		  Osmania University, Hyderabad
		
		DEPARTMENT OF STATISTIC
		Osmania University
		HYDERABAD-500007 INDIA
		2.B. Bhargavi
		  Head – Department of Statistics
		  Andhra Mahila Sabha Arts &
		  Science College
		  Osmania University, Hyderabad
		
		B. Bhargavi
		
		3.Dr. N. Balakrishna (NIN)
		  Hyderabad	