KAKATIYA UNIVERSITY
Under Graduate Courses (Under CBCS AY: 2019-2022)
B.Sc. STATISTICS
I Year :: Semester-II

DSC-2/Paper-2: **Probability Distributions**
[4 HPW :: 4 Credits :: 100 Marks (External:80, Internal:20)]

Unit-I

Discrete distributions-I: Uniform and Bernoulli distributions and their properties, functions and properties such as mean, median, mode, moments upto fourth order, moment generating function(m.g.f), cumulants upto fourth order, cumulant generating function(c.g.f), mean, variance and simple examples, derivation of probability mass(p.m.f), probability generating function(p.g.f), characteristic function(c.f), reproductive property (wherever exists) and their real life applications of of: Binomial distribution, Poisson distribution. Poisson approximation to Binomial distribution.

Unit-II

Discrete distributions-II: Negative binomial, Geometric, Hyper-geometric distribution distributions and their properties, Definitions and real life applications, properties of these distributions such as mean, variance, m.g.f, c.g.f., p.g.f., c.f. and moments upto fourth order, reproductive property (wherever exists), lack of memory property for Geometric distribution, Poisson approximation to Negative binomial distribution, Binomial approximation to Hyper-geometric distribution.

Unit-III

Continuous distributions-I: Rectangular and Normal distributions: definition, properties such as mean, variance, moments upto fourth order, m.g.f., c.g.f., c.f., reproductive property (wherever exists) and their real life applications. Normal distribution as a limiting case of Binomial and Poisson distributions. All properties of Normal distribution with examples.

Unit-IV

Continuous distributions-II: Exponential, Gamma distributions: definition, properties, m.g.f., c.g.f., c.f. and moments upto fourth order, reproductive property (wherever exists) and their real life applications. Beta distribution of two kinds: Definitions, mean and variance. Cauchy distribution, its definition and c.f.

Definition of convergence in Law, Convergence in Probability and Almost sure convergence. Definitions of Weak Law of Large Numbers (WLLN), Strong Law of Large numbers (SLLN), Central Limit Theorem (CLT) with simple examples. CLT for identically and independently distributed (i.i.d) random variables with finite variance.

References:

1. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. M. Jagan Mohan Rao and Papa Rao: A Text book of Statistics (Paper-I).
3. Goon A M, Gupta M K, Das Gupta B : Fundamentals of Statistics, (Vol-I), The World Press (Pvt) Ltd., Kolkata.
4. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC, PHI

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Practical-2
Probability Distributions
(3 HPW :: 1 Credit :: 25 Marks)

Part-1 (Using Calculator)

1. Fitting of Binomial distribution-Direct method.
2. Fitting of Binomial distribution-Recurrence relation Method.
3. Fitting of Poisson distribution-Direct method
4. Fitting of Poisson distribution-Recurrence relation Method.
5. Fitting of Negative Binomial distribution.
6. Fitting of Geometric distribution.
7. Fitting of Normal distribution-Areas method.
8. Fitting of Normal distribution - Ordinates method.

Part-2 (Using MS-Excel)

1. Fitting of Binomial distribution-Direct method.
2. Fitting of Poisson distribution-Direct method.
3. Fitting of Normal distribution-Areas method.
4. Fitting of Exponential distribution.
5. Fitting of Cauchy distribution.

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Question Papers Pattern

(A) **Final Examination:**　　　KAKATIYA UNIVERSITY
　　　　　　　　　　　　　　　　B.Sc. (STATISTICS)
　　　　　　　　　　　　　　Theory Question Paper Pattern
　　　　　　　　　　　　　　Academic Years: 2019-2022

Time: 3 hours]　　　　　　　　　　　　　　　　　　　[Max. Marks: 80

Section - A
Answer ALL questions. All questions carry equal marks.　(4Qx12m=48)

Q1. (a)
　　　　[OR]　　　　　From Unit-I
Q1. (b)

Q2. (a)
　　　　[OR]　　　　　From Unit-II
Q2. (b)

Q3. (a)
　　　　[OR]　　　　　From Unit-III
Q3. (b)

Q4. (a)
　　　　[OR]　　　　　From Unit-IV
Q4. (b)

Section - B
Answer any EIGHT questions. All questions carry equal marks.　(8Qx4m=32)

Q5
Q6　　　　　　From Unit-I
Q7

Q8
Q9　　　　　　From Unit-II
Q10

Q11
Q12　　　　　From Unit-III
Q13

Q14
Q15　　　　　From Unit-IV
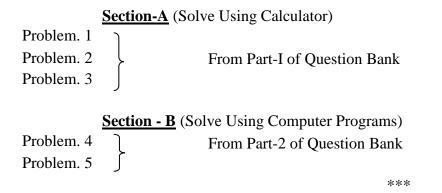Q16

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KAKATIYA UNIVERSITY

B.Sc. (STATISTICS)

Practical Question Paper Pattern
Academic Years: 2019-2022

Time: 2 hours]   **[Max. Marks: 25**

[Practical:15, Record:5, Viva:5]

Note: Solve any THREE problems choosing at least one from each Section

Section-A (Solve Using Calculator)

Problem. 1 ⎫
Problem. 2 ⎬   From Part-I of Question Bank
Problem. 3 ⎭

Section - B (Solve Using Computer Programs)

Problem. 4 ⎫   From Part-2 of Question Bank
Problem. 5 ⎭

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(B) Internal Examinations:

1 Two Internal exams are to be conducted and best of two internal marks is considered.
2 First internal exam is to be conducted after completion of Unit-I &II.
3 Second internal exam is to be conducted after completion of Unit-III & IV.
4 Internal Examination duration: 1 hr 30 min.
5 Internal Theory QP consists of 20 marks.
6 10 Short questions are to be given (5Q from each of 2 Completed units).
7 All TEN questions are to be answered (10QX2m=20m).

Prof A Rajendra Prasad
Chairperson, BOS in Statistics, KU