

3rd sem cs

Module 1: Standard distributions

Discrete type – Bernoulli, Binomial, Poisson, Geometric, Uniform --- all pmf, mean, variance, mgf, all derivations – problems – important and named theorems

Continuous type: Uniform, exponential, gamma --- mean, variance, mgf, problems

Normal distribution – all derivations, mean deviation of normal distribution, additive property, standard normal distribution, standard normal table problems, normal distribution as limiting form of binomial distribution

Module 2: Limit theorems

Chebyshev's inequality – theorem and proof

Convergence in probability – theorem

Weak law of large numbers – theorem and proof

Bernoulli's law of large numbers – theorem and proof

Central limit theorem or Lindberg-levy theorem – theorem and proof – very important

All problems

Module 3: definition of population and sample

Methods of random sampling : simple random sampling, stratified random sampling, systematic sampling, cluster sampling (refer the notes on notebook)

Sampling error and non sampling errors

Module 4: Sampling distributions

Definition of parameter and statistic

Definition of sampling distribution

Sampling distribution of sample mean – (derivation important)

Sampling distribution of sample variance – (derivation important)

Chi square statistic, t statistic, F statistic – study

Chi square distribution – pdf -study , mean, variance, mgf, additive property – (derivation)

Relationships:

1. The square of t variate with n df is $F(1, n)$. (Proof)
2. F is the ratio of two chi squares. (Proof)
3. Examples of statistic following student's t distribution (refer notebook or text)

