**Sampling distribution-**

1. ~~Population, sample, random sample, parameter, statistic.~~
2. ~~Sampling distribution of a statistic.~~
3. ~~Standard error of sample mean.~~
4. ~~Sampling distribution of sample mean from N (µ, variance)~~
5. Unbiased estimator for population mean and variance.
6. ~~Application of Central Limit Theorem.~~
7. ~~Sample size for estimating mean with confidence coefficient.~~
8. ~~Joint m.g.f theorem. – 3 cases~~

**Chi – Square Distribution -**

1. Chi – square distribution
2. M.g.f of Chi – square distribution.
3. Mode of Chi – Square distribution
4. Recurrence relation of Chi – square distribution
5. Additive property of chi – square variates
6. Proof, theorem
7. Ratio of 2 chi – square variates.
8. Properties of Chi – Square Distribution.

**Students t distribution -**

1. T-test for single mean.
2. Basic assumptions of usage of t-test
3. T – test for difference of means
4. Assumptions of t-test for difference of means
5. Paired Sample t – test
6. Examples of statistic following students t distribution – 2 theorems and proofs.
7. Constants of t- distribution
8. P.d.f of student’s t distribution.
9. Examples of statistic following students t distribution
10. Properties of Student’s t – distribution.

**F distribution -**

1. F – Test for equality of 2 population variances
2. Properties of F – Distribution.
3. Mean and variance of F-distribution

**Hypothesis testing –**

1. Hypothesis – types.
2. Errors in Hypothesis testing
3. 5 steps in hypothesis testing
4. 1-Tailed & 2-Tailed test
5. Test or significance for large samples
6. Critical values or significant value
7. Test of significance for single proportion
8. Test of significance for difference of proportion
9. Confidence Interval
10. Test of significance for single mean [Large sample single mean test]
11. Confidence limits for population mean
12. Test of significance for difference of means.

**Theory of Estimation –**

1. Parameter Space
2. Estimators
3. Characteristics of Estimators.
4. Problems on Unbiasedness.
5. Consistent estimator
6. Conditions for consistent estimators.
7. Problems on consistency
8. Efficient estimators
9. Most efficient estimator
10. Measure of efficiency
11. Problems on efficiency
12. Minimum variance unbiased estimator [MVUE]
13. Properties of MVUE
14. Sufficient statistics
15. Neyman’s condition for sufficiency – Factorisation Theorem
16. Cramer Rao Inequality
17. Rao- Blackwell Theorem
18. Methods of Estimation
19. Likelyhood function
20. Method of minimum likelyhood estimation
21. Properties of M.L.E
22. Problems on Finding M.L.E
23. Interval estimation