



QP CODE: 25024532



Reg No : .....

Name : .....

**M.Sc DEGREE (CSS) EXAMINATION, APRIL 2025**

**Fourth Semester**

M Sc OPERATIONS RESEARCH AND COMPUTER APPLICATIONS

**CORE - CE020401 - ADVANCED RELIABILITY THEORY**

2019 ADMISSION ONWARDS

6B53BDEA

Time: 3 Hours

Weightage: 30

**Part A (Short Answer Questions)**

*Answer any **eight** questions.*

*Weight 1 each.*

1. Explain the duration of Adequate performance.
2. Define Structure function.
3. Define Coherent system and a parallel system.
4. Briefly explain that the failure rate is constant if the life time distribution is exponential.
5. How to define Reliable life?
6. Define Rayleigh distribution with its life time properties.
7. Explain IFRA, IFR and Bath tub curve.
8. Define Ageing distributions with examples.
9. Explain the properties of mean residual life.
10. What do you mean by Progressive type I censoring?

(8×1=8 weightage)

**Part B (Short Essay/Problems)**

*Answer any **six** questions.*

*Weight 2 each.*

11. Define parallel system and k out of n system. Distinguish the reliabilities of parallel and k out of n system.
12. Explain a) Reliability b) Parallel system c) Series system d) k out of n system e) Coherent system f) Irrelevant component
13. Express the relationship between Hazard rate function and Reliability function.





14. State and prove lack of memory property of exponential distribution.
15. Define exponential distribution with its ageing properties.
16. Define Inverse Gaussian distribution with its Ageing properties.
17. Describe Right censoring and Left censoring.
18. Define:
  - a) Random censoring
  - b) Marginal probability

(6×2=12 weightage)

**Part C (Essay Type Questions)**

*Answer any **two** questions.*

*Weight **5** each.*

19.
  1. Explain Reliable life.
  2. Express exponential reliable life.
  3. Describe the reliable life of Weibull distribution.
20. Compare the life time properties of Logistic distribution and Log-logistic distribution.
21. Explain the Ageing properties of Gompertz distribution and Makeham distribution.
22. Describe IFR, DFR, NBU, NBUE, DMRL classes and its properties.

(2×5=10 weightage)

