



QP CODE: 26019265



Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, MARCH 2026

Fourth Semester

M Sc OPERATIONS RESEARCH AND COMPUTER APPLICATIONS

Core Courses - CE020401 - ADVANCED RELIABILITY THEORY

2019 Admission Onwards

B06A8549

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Define Structure function of a System.
2. Explain Reliability of a Parallel system.
3. Explain k out of n system and a series structure.
4. Find the Reliability function of an exponential distribution.
5. Define Normal distribution with its life time properties.
6. Prove that mean residual life function is constant if the distribution is Exponential.
7. How to define linear failure rate function?
8. Define increasing failure rate in average.
9. Define New better than used in expectation in life distributions.
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. Discuss Reliability in Statistics. Also explain structure function.





12. Define
 - a) Irrelevant Component
 - b) Minimal path set
 - c) Minimal cut set
 - d) coherent system
13. If $X \sim U(0, \theta)$, $\theta > 0$. Find the hazard rate function and mean residual life function.
14. Explain Gamma life distribution with its properties.
15.
 - a) Explain the properties of basic ageing classes.
 - b) Describe Ageing properties of IFR and DFR.
16. Describe log-normal distribution and its Ageing properties.
17. Define :
 - a) Censoring
 - b) Type I and type II right censoring
18. Construct likelihood function for type I right censoring.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

Weight 5 each.

19. Define :
 - a) Survival function
 - b) Failure rate
 - c) Life distributions
 - d) Mean time to failure
 - e) Express the relationship between hazard rate function and reliability function.
20. Explain Log-logistic distribution with its life time properties.
21. Compare Ageing properties of Gamma distribution and Exponential distribution.
22. Explain basic Ageing properties in Normal distribution and log-normal distribution.

(2×5=10 weightage)

