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0105N092

Candidate's Seat No :_____

MSc Sem.-2 Examination

407

Statistics

Time : 2-30 Hours] **May-2025** **[Max. Marks : 70**

Q-1 (A): Establish the relationship between hazard rate and pdf for a continuous variable. **[07]**

Q-1 (B): Prove the independence of variables on the basis of iid exponential variates with parameter λ. **[07]**

=OR=

Q-1 (A): What is exponential lifetime model? What is memoryless property? Explain hazard function, hazard rate and types of failure in detail. **[07]**

Q-1 (B): Explain mtbf and mttf with suitable examples and establish the relation between mtbf and R (t). **[07]**

Q-2 (A): Write a short note on phenomenon of censoring. **[07]**

Q-2 (B): Explain Type II Censoring Scheme without replacement in detail. **[07]**

=OR=

Q-2 (A): Explain Rayleigh Life Time Model using type I censoring scheme with replacement. **[07]**

Q-2 (B): Explain weibull life time model considering type II censoring. **[07]**

Q-3 (A): Explain two parameter exponential life time model considering type II censoring without replacement. **[07]**

Q-3 (B): Explain geometric life time model considering type I censoring. **[07]**

=OR=

Q-3 (A): Explain sample size determination with minimum cost under type-II censoring using Fisher's Method. **[07]**

(P.T.O)

Q-3 (B): Explain hazard rate estimation for weibull life time model using Sinha and Fu method. **[07]**

Q-4 (A): Explain in detail series system in reliability. **[07]**

Q-4 (B): Explain in detail parallel system in reliability. **[07]**

=OR=

Q-4 (A): Write a short note on redundancy and also explain the classification of redundancy with the help of a suitable chart. **[07]**

Q-4 (B): Explain stand-by system with any one of the switching methods. **[07]**

Q-5: ANSWER IN SHORT: [ANY 7] **[14]**

1. In which distribution with discrete nature, hazard rate is parameter itself?
2. Define Redundancy. Give suitable example.
3. Define Perfect Switching. Give suitable example.
4. Define Imperfect Switching. Give suitable example.
5. What is fully redundant, partially redundant and non redundant system?
6. Explain the term Reliability with suitable example.
7. Explain the term Lifetime with suitable example.
8. Define Hazard Function and Hazard Rate.
9. Define Initial Failure Rate. Give examples.
10. Define Wear Out Failure Rate. Give examples.
11. Define Instantaneous Failure Rate. Give examples.
12. In which distribution, hazard rate is constant? In which distribution, hazard rate increases with time?

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