

2/82

0706E439

Candidate's Seat No : _____

M.Sc Sem.-2 Examination

P - 407

Statistics

June 2022

Time : 2-00 Hours]

[Max. Marks : 50

INSTRUCTIONS:

- **ALL QUESTIONS IN SECTION 1 CARRY EQUAL MARKS.**
- **ATTEMPT ANY THREE QUESTIONS IN SECTION-I.**
- **SECTION-II IS COMPULSORY WITH INTERNAL OPTIONS.**

SECTION-I

ATTEMPT ANY THREE QUESTIONS FROM THE FOLLOWING: [42]

- Q-1:** State the exponential lifetime model. Also state all the properties of the exponential lifetime model. [14]
- Q-2 (A):** Explain the parallel system and establish the relation between cdf of parallel system and components. [07]
- Q-2 (B):** Explain parallel in series system in detail. [07]
- Q-3 (A):** Define system reliability. Explain the series system and establish the relation between cdf of series system and components. [07]
- Q-3 (B):** Explain series in parallel system in detail. [07]
- Q-4:** Write a detailed note on Redundancy and describe in detail reliability of 'k' out of 'n' system. [14]
- Q-5:** Explain Type I Censoring Scheme without replacement. [14]

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- Q-6 (A):** State and prove the memoryless property of the exponential lifetime model. Also prove its converse. [07]
- Q-6 (B):** What do you mean by mtbf and mttf? Explain in detail. Also establish the relation between mtbf and $R(t)$. [07]
- Q-7:** Explain Type II Censoring Scheme without replacement. [14]
- Q-8 (A):** Write a detailed note on standby system with perfect switching. [07]
- Q-8 (B):** Write a detailed note on standby system with imperfect switching. [07]

SECTION-II

Q-9 ANSWER IN SHORT: [ANY 8] [08]

1. Define Reliability.
2. Define Lifetime.
3. Define Hazard Function.
4. Define Initial Failure Rate.
5. Define Wear Out Failure Rate.
6. Define Instantaneous Failure Rate.
7. In which distribution, hazard rate is constant?
8. In which distribution, hazard rate increases with time?
9. In which distribution with discrete nature, hazard rate is parameter itself?
10. What is fully redundant system?
11. What is partially redundant system?
12. What is non redundant system?
13. Define Redundancy.
14. Define Perfect Switching.
15. Define Imperfect Switching.
16. Define mtbf.