



QP CODE: 25022334



Reg No :

Name :

M.Sc DEGREE (CSS) SPECIAL REAPPEARANCE EXAMINATION, APRIL 2025

Third Semester

M.Sc BIOSTATISTICS

CORE - ST020304 - ADVANCED EPIDEMIOLOGY AND BIOASSAYS

2019 ADMISSION ONWARDS

53407F35

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Explain the three key properties of a confounder.
2. How to minimize selection bias in analysis stage?
3. What is attributable risk and Excess risk?
4. What is meant by receiver operator characteristic curve?
5. Define biological assay.
6. List the types of biological assays.
7. What do you mean by median dose?
8. Explain Spearman-Kärber Method.
9. Briefly explain the concept of safe dose.
10. Write a short note on median dose and safe dose.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain interaction with the help of an example.
12. Distinguish between random error and systematic error.
13. Explain differential misclassification bias with an example in an epidemiologic study.
14. Explain necessary and sufficient cause of a disease. Illustrate it with examples.





15. A research team evaluated the DST performance using new positivity criterion. Test sensitivity was 43% and test specificity was 96%. Assuming the prevalence of major depression (approximately) 5%, determine predictive value positive and predictive value negative using Baye's rule.
16. Explain in detail the regression approaches for estimating dose response relationships.
17. Derive the estimation of relative potency in quantal response.
18. Write about the estimation of doses.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight **5** each.

19. Consider the following data on the relationship between depression and obesity from a hypothetical case – control study:

	Obesity		
Depression	Obese	Non Obese	Totals
Overall			
Yes	12241	29155	41396
No	55947	190419	246366
Yes	6211	18851	25062
No	25110	88082	113192
Female			
Yes	6030	10304	16334
No	30837	102337	133174

Is gender a confounder, effect modifier or mediator of the relationship between depression and obesity ? Discuss each possibility and calculate and interpret all relevant measures of association to support your conclusion.

20. Write a note on Information bias in epidemiological study.
21. Write a note on kappa measure of agreement.
22. Discuss the methods of logit and probit analysis. Add a note on their applications in biological assays.

(2×5=10 weightage)

