

[LF 1014]

OCTOBER 2014

Sub. Code: 2865

**M.Sc., NON-MEDICAL DEGREE EXAMINATION
SECOND YEAR
(New Regulation)
BRANCH II - BIOSTATISTICS
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code : 282865

Time : Three hours

Maximum : 100 marks

I. Elaborate on :

(2 x 20 = 40)

1. Explain the adequacy of logistic regression analysis by
 - a) evaluating the model and its fit
 - b) assessing the predictive efficiency and
 - c) investigating the assumptions
2.
 - a) Why do we perform multiple linear regression analysis? what are its assumptions?
 - b) Explain the assessment of goodness of fit in multiple regression analysis.
 - c) How will you handle outliers and influential observations?

II. Write notes on:

(10 x 6 = 60)

1. Explain dummy variables and its role in regression analysis
2. Explain multicollinearity by giving an example in medical research.
3. Compare the odds ratio and relative risk.
4. Explain multinomial and ordinal logistic regression.
5. Explain conditional logistic regression.
6. What is Poisson regression? Give an example.
7. What is confounding and interaction? Explain by giving an example.
8. What is censored data? Explain proportional hazard assumption.
9. Explain the term 'survival' and 'hazard' in survival analysis.
10. Explain the measures of agreement using kappa and weighted kappa.

[LH 0415]

OCTOBER 2015

Sub. Code: 2865

**M.Sc., NON – MEDICAL DEGREE COURSES
BRANCH II - BIOSTATISTICS
SECOND YEAR
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code: 282865

Time: Three hours

Maximum: 100 marks

I. Elaborate on:

(2 x 20 = 40)

1. (a) Explain the role of multiple logistic regression analysis by giving an example.
(b) Mention the use of Negalkar R-square in logistic regression?
(c) Explain the two major components of discrimination and calibration in the evaluation of logistic regression model performance.
2. (a) Explain the proportional hazard regression analysis.
(b) How will you assess the goodness of fit in Cox-regression?
(b) What are the problems encountered in survival analysis?

II. Write notes on:

(10 x 6 = 60)

1. Why do we perform multiple regression analysis? What are its assumptions?
2. How will you use nominal, ordinal and numerical explanatory variables in multiple linear regression analysis?
3. What is confounding and interaction? Explain by giving an example.
4. Compare the odds ratio and relative risk.
5. Explain multinomial and ordinal logistic regression.
6. What is censored data? What is informative censoring?
7. What is Kaplan-Meier estimate? Explain the use of log rank test.
8. Explain a matched case-control study.
9. Explain the measures of agreement using kappa and weighted kappa.
10. What is generalized linear model?

[LJ 1016]

OCTOBER 2016

Sub. Code: 2865

**M.Sc. BIOSTATISTICS EXAMS
SECOND YEAR
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code: 282865

Time: Three hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Explain with example for Kaplan – Meir survival analysis.
2. a) How do you evaluate the model and fit in logistic regression?
b) Assumptions for logistic regression.

II. Write notes on:

(10 x 6 = 60)

1. Explain unconditional logistic regression.
2. Role of dummy variables in regression analysis.
3. Cox and Snell R square.
4. Difference between odds ratio and relative risk.
5. Censored data with example.
6. Ordinal regression.
7. Weighted Kappa.
8. Hypothesis of independence.
9. Stratified analysis.
10. Log linear models for three way table.

[LL 1017]

OCTOBER 2017

Sub. Code: 2865

**M.Sc. BIOSTATISTICS EXAMS
SECOND YEAR
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code: 282865

Time: Three hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Explain multiple regression analysis in detail.
2. Describe log linear models for two and three way tables.

II. Write notes on:

(10 x 6 = 60)

1. Explain ordinal, polytomous and count data.
2. Describe residual analysis.
3. Explain conditional models of a logistic regression analysis.
4. Describe the sampling distributions for discrete data.
5. How will you test the hypothesis of Independence in a contingency table?
6. Explain measure of agreement.
7. Explain Kaplan-Meier estimate.
8. Describe log-rank test and explain its uses.
9. What is meant by time dependant covariate?
10. What is stratified analysis?

[LN 1018]

OCTOBER 2018

Sub. Code: 2865

**M.Sc. BIOSTATISTICS EXAMS
SECOND YEAR
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code: 282865

Time: Three hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. What are the measure of agreement? What are the conditional and unconditional probability models for binary variables?
2. What is Count data and Poission regression in Multiple regression?
What are the types of variables used in multiple regression with an example?

II. Write notes on:

(10 x 6 = 60)

1. Explain Logistic regression for ordinal data.
2. How to estimate odds ratio?
3. Explain residual analysis.
4. Hypothesis of homogeneity.
5. What are the measure of association?
6. Measure of Kappa and weighted kappa.
7. Conditional logistic regression.
8. Weibull for parametric distribution.
9. Log rank for uncensored data.
10. Cox's proportional Hazard model.

[LO 0519]

MAY 2019

Sub. Code: 2865

**M.Sc. BIOSTATISTICS EXAMS
SECOND YEAR
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code: 282865

Time: Three hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Multiple regression for continuous data and residual analysis.
2. Cox-proportional hazard model and log plot.

II. Write notes on:

(10 x 6 = 60)

1. Sources of multicollinearity.
2. Logistic regression for ordinal data.
3. Dummy variables in multiple regression.
4. Poisson regression.
5. Contingency tables.
6. Relative risk and odds ratio.
7. Weighted Kappa measure of agreement.
8. Left and right censoring.
9. Logrank test for censored data.
10. Stratified analysis.

[LP 1019]

OCTOBER 2019

Sub. Code: 2865

**M.Sc. BIOSTATISTICS EXAMS
SECOND YEAR
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code: 282865

Time: Three hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Residual analysis and methods of scaling residuals.
2. Log linear models for two and three way models.

II. Write notes on:

(10 x 6 = 60)

1. Logistic regression.
2. Testing of multiple regression coefficients.
3. Ordinal, polytomous and count data.
4. Poisson regression.
5. Estimation of odds ratio.
6. Measures of agreement.
7. Collapsibility and model building in categorical data analysis.
8. Log rank test for censored data.
9. Proportional hazard model.
10. Stratified analysis.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0321]

MARCH 2021

Sub. Code: 2865

(OCTOBER 2020 EXAM SESSION)

M.Sc. BIOSTATISTICS

SECOND YEAR (From 2011-2012 onwards)

PAPER I – APPLIED REGRESSION METHODS

Q.P. Code : 282865

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Assumptions of the model and fit in logistic regression.
2. Log linear models for two and three way tables.

II. Write Short Notes on:

(10x6 = 60)

1. Sources of multicollinearity
2. Analysis of contingency tables.
3. Hypothesis of homogeneity and Independence.
4. Logistic model for ordinal data and Polytomous data.
5. Kappa measure of agreement.
6. Censored data.
7. Relative risk and odds ratio.
8. Weibull and exponential distribution.
9. Hazard functions.
10. Stratified analysis

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[AHS 0122]

**JANUARY 2022
(OCTOBER 2021 EXAM SESSION)**

Sub. Code: 2865

**M.Sc. BIOSTATISTICS
SECOND YEAR (From 2011-2012 onwards)
PAPER I – APPLIED REGRESSION METHODS
*Q.P. Code : 282865***

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Count data and Poisson regression.
2. Types of censoring.

II. Write Short Notes on:

(10x6 = 60)

1. Mantel-Haenszel procedure.
2. Estimating Odds ratio.
3. Logistic model for ordinal data.
4. Log linear models for two way tables.
5. Collapsibility and model building.
6. Cox's proportional hazard model.
7. Log plot.
8. Exponential distribution.
9. Dummy variables in multiple regression.
10. Analysis of contingency tables.

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[AHS 1022]

OCTOBER 2022

Sub. Code: 2865

**M.Sc. BIostatistics
SECOND YEAR (From 2011-2012 onwards)
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code : 282865

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Multiple regression for continuous data and residual analysis.
2. Kaplan – Meir survival analysis with an example.

II. Write Short Notes on:

(10x6 = 60)

1. Sources of multicollinearity
2. Unconditional logistic regression.
3. Analysis of contingency tables.
4. Log linear models for three way tables.
5. Weighted Kappa.
6. Cox's proportional hazard model.
7. Relative risk and odds ratio.
8. Generalized Wilcoxon test for censored data.
9. Logistic regression for ordinal, polytomous data.
10. Hypothesis of independence.

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[AHS 1023]

OCTOBER 2023

Sub. Code: 2865

**M.Sc. BIOSTATISTICS
SECOND YEAR (From 2011-2012 onwards)
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code: 282865

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. (a) Explain the role of Hosmer – Lemeshow test in multiple logistic regression analysis by giving an example? (b) Under what situation logistic regression could be used? Explain.
2. How will you compare two survival functions? Describe the test used in this regard.

II. Write Short Notes on:

(10x6 = 60)

1. Test used to estimate the common odds ratio and to test whether the overall degree of association is significant.
2. Models to describe association and interaction patterns among categorical variables.
3. Model used to assess Hazard risk.
4. What is Poisson regression? Give an example.
5. Collapsibility and model building in log linear model.
6. Left and right censoring.
7. Suppose you want to fit an exponential survival model to your data. Before doing that, how would you check whether this model is suitable for your data?
8. Generalized Wilcoxon test for censored and uncensored data.
9. Confidence interval for measures of association.
10. What is count data in Poisson regression and why it is used?

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[AHS 1024]

OCTOBER 2024

Sub. Code: 2865

**M.Sc. BIOSTATISTICS
SECOND YEAR (From 2011-2012 onwards)
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code: 282865

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. a. Discuss a parameter estimation method in non linear regression model. Also discuss criteria for evaluating subset regression models.
b. How do you interpret the parameters in a Logistic regression model? In Health Research how the model is useful?
2. (a) What do you mean by censoring? What are the different types of censoring? How will you construct the likelihood if the data is right censored? Give an example. Find expressions for median survival λ .

II. Write Short Notes on:

(10x6 = 60)

1. Mean time and mean residual survival time for Exponential distribution.
2. Multicollinearity in multiple regressions.
3. What is contingency tables and how it could be analysed?
4. Concepts of logistic model for polytomous data.
5. Estimating and interpreting Odds ratio.
6. Sampling distribution for continuous data.
7. Count data and Poisson Regression.
8. Mantel-Hansel procedures.
9. Test for homogeneity and Independence of data.
10. Types of finding measure of agreement.

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[AHS 1025]

OCTOBER 2025

Sub. Code: 2865

**M.Sc. BIOSTATISTICS
SECOND YEAR (From 2011-2012)
PAPER I – APPLIED REGRESSION METHODS**

Q.P. Code: 282865

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate notes on:

(2 x 20 = 40)

1. Structural component, functional component and link function for a binary outcome.
2. Concept of linear regression by explaining assumptions, evaluating the model fit and diagnostics of a proper model.

II. Write Short Notes on:

(10x6 = 60)

1. Measures of agreement.
2. Contingency tables.
3. Left and right censoring.
4. Method of scaling residuals.
5. Generalized Wilcoxon test for censored and uncensored data.
6. Concept of multicollinearity and VIF.
7. Hypothesis of Homogeneity and Independence.
8. Stratified Cox model.
9. Odds Ratio and confidence interval.
10. Key Diagnostics for Count Regression.
