

Assignment MST-025

for

M.Sc. (Applied Statistics) (MSCAST)

Valid from January 2025 to December 2025

SCHOOL OF SCIENCES

Indira Gandhi National Open University New Delhi - 110068

Dear Learner,

Welcome to the M.Sc. (Applied Statistics) Programme.

As per the university guidelines, you need to complete the assignment for each theory course. Note that there are no assignments for lab courses in the MSCAST programme, namely, MSTL-011, MSTL-012, MSTL-013, MSTL-014, and MSTL-015. You should remember that writing answers to an assignment's questions will improve your writing skills and prepare you for the term-end examination.

It is compulsory to submit the assignments within the stipulated time to be eligible to appear in the term-end examination. You will not be allowed to appear for the term-end examination for a course if you do not submit the assignment for that course by the due date. As per the University guidelines, if you appear in the term-end examination of a course without submitting its assignment, the result of the term-end examination is liable to be cancelled/ withheld.

The assignments constitute the continuous component of the evaluation process and have 30% weightage in the final grading.

Before you write the assignments, you are advised to first go through the self-learning material for that course and then prepare the assignments carefully by following the instructions pertaining to the assignments. Your responses should not be a verbatim reproduction of the textual materials provided for self-learning purposes, but it should be in your own words.

If you have any doubts or problems pertaining to the course material and assignments, contact the programme in charge or the academic counsellor at your study centre. If you still have problems related to this assignment, feel free to contact the course coordinator.

Wishing you all the best in successfully completing the programme.

(Dr. Neha Garg) Course Coordinator, MST-025 Email: nehagarg@ignou.ac.in

Instructions:

- Submit the assignments within the stipulated time. Otherwise, you will not be permitted to appear for the term-end examination.
- Solve the latest assignments uploaded for the current year/session.
- Read the instructions related to the assignments mentioned in the Programme Guide.
- Use only A-4 size paper to write your responses. It is mandatory to write all assignments neatly in your own handwriting. Typed or printed copies of the assignments will not be accepted. Note that you may use the printout only if a question specifically asks for the output of a program in MST-015 and MST-024.
- > All questions given in the assignments are compulsory for each course.
- Express your response in your own words. You are advised to restrict your response based on the marks assigned to it. This will also help you to distribute your time in writing or completing your assignments on time.
- Securely fasten multiple pages together (you can staple or tie them) and number them carefully for each assignment separately.
- Do not forget to enclose the assignment question sheet of that course after the cover page of the assignment response (answer sheets). It is not compulsory to write each question separately before answering the question. Mention the question number for each answer.
- The solved assignment must be submitted at the Study Centre allotted to you before the due date set by the University. Please check the IGNOU website for updated information regarding the due date of assignment submission.
- You are advised to mention all information on the first page of the assignment response sheet, given on the next page.
- Keep a copy of the assignment answer sheets with you before submission for future reference.

ASSIGNMENT	Т СОЛЕ• ИСТ_ООС /	ТМА /9095
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NAME:		
ENROLLMENT NO:		
ADMISSION CYCLE:		
PROGRAMME CODE: <u>MSC</u>	CAST	
COURSE CODE: <u>MST-025</u>		
COURSE TITLE: <u>CATEGO</u>	RICAL AND SURVIVAL ANALY	<u>515</u>
REGIONAL CENTRE COD	E:	
STUDY CENTRE CODE:		
ADDRESS:		
CONTACT NUMBER:		
EMAIL ID:		
DATE OF SUBMISSION:		
K	ignou THE PEOPLE'S UNIVERSITY	
•	School of Sciences	

Course Code: MST-025 Assignment Code: MST-025/TMA/2025 Maximum Marks: 50

Note: All questions are compulsory. Answer in your own words.

- 1. Differentiate between the following:
 - (a) Relative risk and odds ratio
 - (b) Chi-square tests for association and proportions

(10)

2. To study the association between diabetic patients and their family history of diabetes, the following data were obtained on 70 subjects.

Diabetes in Family	Diabetes in Subject		Total
	Yes	No	
Yes	14	3	17
No	3	50	53
Total	17	53	70

Which test is appropriate in this situation? Check whether the diabetes runs with generations in families or not at a 5% level of significance using a suitable test. (15)

- **3.** Describe censoring and differentiate between different types of censoring with the help of examples. (10)
- 4. A study was conducted on 185 patients aged more than 45 years, which were followed until the time of death or up to 10 years, whichever comes first. The patients have different covariates: age, gender (male/female), systolic blood pressure, smoking (yes/no), total serum cholesterol, and diabetes (yes/no). This study aims to determine which covariate influences the survival time. An analysis is conducted to investigate differences in all-cause mortality between men and women participating in the study. Suppose we obtain the following results after applying the Cox regression hazard model analyses:

Risk Factor	Parameter Estimate	SE
Age	0.150	0.010
Gender	0.450	0.150
Systolic Blood Pressure	0.015	0.008
Smoking	0.650	0.170
Total Serum Cholesterol	0.002	0.004
Diabetes	-0.350	0.250

- (i) Obtain hazard ratio and interpret the results.
- (ii) Find the 99% confidence interval for the hazard ratio.
- (iii) Test whether the covariates are significant or not at 1% level of significance.