

# **Assignment MST-019**

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. Rajesh)**  
**Course Coordinator, MST-019**  
**Email: [rajesh.sos@ignou.ac.in](mailto:rajesh.sos@ignou.ac.in)**  
**Mob. No. : 9416413104/8860416548**

### 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 CODE: MST-019/TMA/2025**

NAME: \_\_\_\_\_

ENROLLMENT NO: \_\_\_\_\_

ADMISSION CYCLE: \_\_\_\_\_

PROGRAMME CODE: MSCAST

COURSE CODE: MST-019

COURSE TITLE: EPIDEMIOLOGY AND CLINICAL TRIALS

REGIONAL CENTRE CODE: \_\_\_\_\_

STUDY CENTRE CODE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

CONTACT NUMBER: \_\_\_\_\_

EMAIL ID: \_\_\_\_\_

DATE OF SUBMISSION: \_\_\_\_\_



School of Sciences

**Indira Gandhi National Open University**

Maidan Garhi, New Delhi-110068 (INDIA)

**TUTOR MARKED ASSIGNMENT**  
**MST-019: Epidemiology and Clinical Trials**

Course Code: MST-019

Assignment Code: MST-019/TMA/2025

Maximum Marks: 50

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

1. (a) In the natural history of a disease define total preclinical phase, detectable pre-clinical phase and clinical phase. Suppose on 09 am on 25.01.2024 a disease A onset you biologically. Suppose a test of disease A can detect it exactly after the completion of 30 days of biological onset. Suppose signs and symptoms develop exactly after the completion of 34 days of biological onset. Suppose you consult a doctor exactly after 37 days of the biological onset of the disease. Suppose the outcome of the treatment is the cure. What is the duration of the (i) total preclinical phase (ii) detectable pre-clinical phase (iii) clinical phase?
  - (b) If  $p$  denotes proportion and  $q$  denotes odds then prove that  $q = \frac{p}{1-p}$ . Find the range of  $q$ . If the odds of smokers in a study are 0.75 then find the proportion of smokers in the study. Assume that each subject of the study is either a smoker or a non-smoker.
  - (c) A trial is conducted in which some people with disease X were randomly allocated into two groups. The first group was advised to do some morning walks for 30 minutes and take light food each day and the second group was given one injection and one 100 mg tablet once a day to control disease X. The injection can cause loose motion in some cases and 100 mg tablet has no side effect. At the end of two months, 90% of group I and 80% of group II had recovered from disease X.
    - i) What are the regimens for group I and group II in this trial?
    - ii) What are the efficacies in group I and group II?
    - iii) What are the safety issues in group I and group II in this trial?
- (4 + 4 + 2)**
2. Explain the entire procedure of any one of the three study designs (a) Cross Sectional (b) Cohort (c) Case Control.

**(20)**
  3. If you are told that hemoglobin (Hb) level in blood measures the iron content. The normal level in healthy people is around 15 g/dL. Most Indian women have less and some have even less than 8 g/dL. They are called anemic. Iron supplementation is given to increase this level. Suppose one supplementation increases the mean Hb level in anemics by 3.2 g/dL, after one month of use and the other by 3.6 g/dL, in an equivalence trial on 500 women each. The respective SD's of the of the increases are 0.52 and 0.72 g/dL. The doctors determine that the supplementations can be clinically equivalent if the difference between the increases by the two supplementations does not exceed 0.52 g/dL. Can these two supplementations be considered clinically equivalent at 5% level of significance?

**(20)**