MASTER OF ARTS

(ECONOMICS)

(MAEC)

ASSIGNMENT 2026-27

For July 2026 and January 2027 Admission cycle

COURSE CODE: MEC 103

QUANTITATIVE METHODS

SCHOOL OF SOCIAL SCIENCES

INDIRAGANDHINATIONALOPENUNIVERSITY

MAIDAN GARHI, NEW DELHI-68

Dear Student,

As explained in the Programme Guide, evaluation at IGNOU consists of two parts: i) continuous evaluation through assignments, and ii) term-endexamination. In the final result, assignments of a course carry 30% weightage while 70% weightage is given for term-end examination. This Assignment booklet has TMAs for the core course **MEC 103 QUANTITATIVE METHODS** which is a six-credit course.

Before you attempt the assignments, please read the instructions carefully provided in the Programme Guide. It is important that you write the answers to all the TMA questions in your own words. Your answers should be within the approximate range of the word-limit set for a particular section.

As mentioned in the Programme Guide, you need to submit all the assignments within the stipulated time for being eligible to appear in the term-end examination to the **Coordinator of your study centre**. **The assignments should be submitted to the Coordinator of your Study Centre as per the following schedule:**

1. **By 31st March, 2027 by the students who took admission in the Academic Cycle July, 2026**.

2. **By 30th September, 2027 by the students who took admission in the Academic Cycle January, 2027**.

You must obtain a receipt from the Study Centre for the assignments submitted and retain it. If possible, keep a xerox copy of the assignments with you.

The Study Centre will have to return the assignments to you after they are evaluated. Please insist on this. This Study Centre has to send the marks to the Student Evaluation Division at IGNOU, New Delhi.

We expect you to answer each question as per guidelines for each category as mentioned in the assignment. You will find it useful to keep the following points in mind:

Planning: Read the assignments carefully, go through the Units on which they are based. Make some points regarding each question and then rearrange them in a logical order.

Organisation: Be a little selective and analytic before drawing up a rough outline of your answer. Give adequate attention to your introduction and conclusion.

1)

2) Make sure that your answer:

   a) is logical and coherent;

   b) has clear connections between sentences and paragraphs, and

   c) is written correctly giving adequate consideration to your expression, style and presentation.

3) **Presentation:** Once you are satisfied with your answer, you can write down the final version for submission, writing each answer neatly and underlining the points you wish to emphasize. Make sure that the answer is within the stipulated word limit.

MEC 103: QUANTITATIVE METHODS
Tutor Marked Assignments

Course Code: MEC- 103
Assignment Code: Asst /TMA /2026-27
Total Marks: 100

PART I

Answer the following questions. Each question carries 20 marks

$2 \times 20 = 40$

1. For the given Cobb-Douglas production function $Q = AL^{\beta} K^{1-\beta,}$ where Q, L and K are the level of output, labour and capital respectively, prove that:

   (a) The function is homogeneous of degree 1.

   (b) Show that Euler's theorem is holding in this case.

   (c) Elasticity of substitution is unity.

2. (a) Consider the following function: $z = f(x_1, x_2, x_3) = x_1^2 - 3x_1x_2 + 3x_2^2 + 4x_2x_3 + 6x_3^2$

   Check whether the function is having a maximum or minimum?

   (b) Find out whether $x^{1/x}$ possesses a maximum or a minimum value.

PART II

Answer the following questions. Each question carries 12 marks.

5 X 12=60

3. (a) Define a standard normal distribution and discuss its properties.

   (b) If the scores are normally distributed with Mean 30 and Standard Deviation of 5, what percentage of the scores is:

   (i) greater than 30?

   (ii) between 28 and 34?

4. Consider a coefficient matrix A, where:

   $A = \begin{bmatrix} 0.8 & 0.2 \\ 0.9 & 0.7 \end{bmatrix}$

   Examine Hawkins-Simon's condition to conclude whether any solution will be possible for the system or not.

5. Describe characteristics of a good estimator.

6. (a) Show that standard deviation is independent of change of origin.

   (b) Prove that the correlation coefficient r is independent of the choice of both origin and scale.

7. Describe linear programming formulation of zero-sum games with suitable example.