BACHELOR OF ARTS
ECONOMICS (HONOURS)
(BAECH)

ASSIGNMENT

2021—22

COURSE CODE: BECC 102

Mathematical Methods in Economics-I

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THE PEOPLE'S
UNIVERSITY

SCHOOL OF SOCIAL SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI 110068

BECC 102 Mathematical Methods in Economics-I
Tutor Marked Assignment

Dear Student,

As we have informed you in the Programme Guide, evaluation at IGNOU consists of two parts: i) continuous evaluation through assignments, and ii) term-end examination. In the final result, assignments of a course carry 30% weightage while 70% weightage is given for term-end examination.

You will have to do three Tutor Marked Assignments (TMA) for a six-credit course, and two TMAs for a four credit course. This Assignment booklet has TMAs for the core course **BECC- 102 Principles of Microeconomics- I** which is a six credit course. The booklet therefore has three TMAs whose total marks add up to 100 and carry a weight of 30 %.

Assignment A has Descriptive Category Questions (DCQs). These are meant for writing essay type answers, with an introduction and a conclusion. These are intended to test your ability to describe your understanding/knowledge about the topic in a systematic, to-the-point and coherent manner.

Assignment B has Middle Category Questions (MCQs). These questions require you to first analyse the topic in terms of arguments and explanations and then write the answers in a concise manner. They are meant to test your ability to distinguish, compare and contrast, or clear understanding of the concepts and processes.

Assignment C has Short Category Questions (SCQs). These questions are meant to improve your skill of recall in brief the relevant/precise information about persons, writing, events, or clear understanding of concepts and processes.

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. Remember, writing answers to assignment questions will improve your writing skills and prepare you for the term-end examination.

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.

Submission of the completed assignments:

Admission batch	Last date of submission	Place of submission
For the students enrolled in July 2021	31st March 2022	Student's study center
For the students enrolled in January 2022	31st October 2022	Student's study center

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. The 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:

1) **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.

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

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.

Wish you all the best !

Discipline of Economics

BECC 102: MATHEMATICAL METHODS IN ECONOMICS
Tutor Marked Assignments

Assignment A
Answer the following Long Category questions in about 500 words each. Each question carries 20 marks. Word limit will not apply in the case of numerical questions.

$2 \times 20 = 40$

1. A monopolist faces the demand curve $Q = 60-P/2$. The cost function is $C=Q^2$. Find the output that maximises this monopolist's profits. What are the prices at profits and that output? Find the elasticity of demand at the profit maximising output.

OR

A monopolist firm has the following total revenue and total cost functions:

$R = -mQ^2 + nQ$ (m,n > 0)
$C = aQ^2 + bQ + c$ (a,b,c > 0)

Suppose that the government plans to levy an excise tax on the product of this firm and wishes to maximise the total tax revenue T from this source. What tax rate   t (rupees per unit of output) should the government choose?

2. A firm in a perfectly competitive market has the following cost function:

$C = 1/3q^3 - 5q^2 + 30q +10$

If the market-clearing price is 6, obtain the profit maximising level of output.

OR

Given the demand function $P_D = 27 - Q^2$ and supply function $P_s = 2Q + 3$. Assuming perfect competition, find (i) the consumers' surplus, (ii) the producers' surplus.

Assignment B
Answer the following Middle Category questions in about 250 words each. Each question carries 10 marks. Word limit will not apply in the case of numerical questions.

$3 \times 10 = 30$

3. Given the total cost function $TC = 9q^2 + 2q + 8100$
(a) Find marginal cost (MC) and average coat (AC) as functions of q
(b) Show that when MC < AC, AC is falling, and when MC > AC, AC is rising

OR

Given the aggregate consumption function $C = 0.9Y + 100$(where C is aggregate consumption and Y is aggregate income)
(a) Find the marginal propensity to consume (MPC) and average propensity to consume (APC)
(b) Find the elasticity of consumption with respect to income, and show that it equals MPC/APC

4 Let $X = \{1,3,5\}$ and $Y = \{2,4,6\}$

Find, $X \cup Y$ and the Cartesian Product of X and Y.

OR

Given A= { 1, 2, }, B= { 3, 4, 5 } and C= { 3, 5, 6, 7, 8 }, show that

(i) $A \cup B = B \cup A$

(ii) $(A \cap B) \cap C = A \cap (B \cap C)$

5. Create a truth table for

(a) $A \Leftrightarrow B$

(b) the converse of 'A implies B'.

OR

Find the Euclidean distance between
(i) (2, 3) and (4, 1)
(ii) (2, 3, 4) and (4, 1, -5)

Assignment C
Answer the following Short Category questions in about 100 words each

5 X 6 = 30

6. What is a point of inflexion ? Does f(x) = x^3 have a point of inflexion at x = 0?

7. Find the integral of
(y^2-1) dx-2dy = 0

8. Evaluate the Limits of

$$\frac{X^2 - X - 2}{X(X - 2)} \ As \ X \to 2.$$

9. If the demand function for a good is Q=140 – 5P, what is the price elasticity of demand at P = 15 rupees?

10. How long will it take a given sum of money (Say in Rupees) to increase 4 times its present value when compounded half yearly at 7% rate of interest?