MATHEMATICAL METHODS-I

II B.A ECONOMICS

Mathematical methods meaning

- This module is designed to teach you about a variety of mathematical methods which are used in modelling through their application to solving real world problems .These methods include differential equations ,linear algebra and vector calculus.

Arithmetic operation

- Arithmetic is a branch of mathematics ,that involves the study of numbers ,operation of numbers that are useful in all the other branches of mathematics.It basically comprises of operation such as Addition,Subtraction,Multiplication and Division.

BASIC RULES OF ARITHMETIC OPERATIONS

- The four basic arithmetic operations in maths:
- Addition
- Subtraction
- Multiplication
- Division

Addition Definition

- The addition is a mathematical process of adding thing together.The addition process is denoted by `+'sign.It can involve any type of number whether it be a real or complex number,fraction or decimals.

Rules for addition

- i)Addition of two positive numbers is a positive numbers.
- Example

  10+5=15

  10+20=30

Continue

- ii)Addition of two negative numbers is a negative numbers.

  Example

  (-10)+(-5)=-15

  (-20)+(-15)=-35

- iii)While adding positive and negative numbers ,subtract the numbers and use the sign of the largest numbers .

  Example

  5+(-3)=2

  -5+3=-2

Subtraction Definition

- Subtraction operation gives the difference between two numbers .Subtraction is denoted by ``-''sign.The addition of the term with the negative term is known as subtraction.

Example

15-7 the term can also be re-written as 15+(-7)=8

Rules

i)If both the signs of the numbers are positive ,the answer, will be the positive numbers.

Example

5+6=11

Continue

- ii)If both the signs of the integers are negative ,the answer will be the negative integer.

  Example

  (-4)-(-8)=-12

iii)If the signs of the integers are different, subtract the values,and take the sign from the largest integer value.

Example

14-11=3

Multiplication Definition

- Multiplication is known as repeated addition .It denoted by `x' .It also combines with the two or more values to result in one a single value.The multiplication process involves mutiplicand,multiplier.The result of the multiplication of multiplicand and the mutiplier is called the product.

Example

2x3=6,``2"is the multiplier,

``3" is the multiplicand result ``6" is the product.

Multiplication Rules

- i)The product of two positive numbers is a positive numbers.

  Example

  4x8=24

ii)The product of two negative numbers is a positive numbers.

  Example

  -2 x -4 =8

iii)The product of positive and negative numbers is a negative numbers.

  Example

  -4 x 5=-20

Division Definition

- The division is usually denoted by `/'and is the inverse of mutiplication.It constitutes two terms dividend and divisor,where the dividend is divided by the divisor to give a single term value.

Example

4/2=2 , ``4'' is the dividend, `2''is the divisor,and the result ``2''is called quotient.

Division Rules

- i)The division of two positive integers is a positive integer.

  Example

  4/2=2

ii)The division of two negative number is a positive integer.

Example

-4/-2=2

iii)The division of integers with different signs results in the negative integer.

Example

-4/2=-2

Uses of Mathematical Techniques in Economic Analysis

- Economic analysis is a primary tool used to evaluate a nation's economy.Economic analysis is commonly defined as a systematic approach to determining the optimum use of scarce or limited economic resources.The analysis often includes several assumptions or constraints found in the economic market place.

USES

i)Facts

Economic analysis often uses quantitative methods when reviewing specific information in an economy .Quantitatives methods are mathematical or statistical calculations that provide economists with indicators for comparing the current economic analysis to those of previous periods.

ii)Calculus

Calculus is the most common type of maths found in economics .Calculus includes the use of various formulas to measure limits,functions and derivatives.Many economists use differential calculus when measuring economic information.

Continue

- iii)Considerations

Economic analysis is only as good as the numbers used in the mathematical equations or economic models.Minor distortions in these numbers can present serious difficulties when attempting to explain or justify economic trends.

iv)Significance

Business owners can use economic information to help forecast expected sales for their business operations.The use of economic analysis in a business is an important management tool when making business plans and decisions.

Operation with zero and one

i)Zero

Zero is the additive identity in arithmetic.That is the number `0' for which x+0=x,0+x=x, -x+0=-x

0-x=-x for all numbers x.So zero has no value or effect in addition and subtraction.

Example

5+0=5 ,-5+0=-5 -8+2+0=-6

Continue

- But multiplication ,the product of zero with any other number is zero.

Example

5x0=0, 0x8=0, 2x6x5x0=0

Division of zero by any non-zero number is zero

Example

0/K=0, 0/4 =0

Continue

ii)One

The multiplicative identity for real number is one .That is the number 1 for which 1x y=y,y x 1=y

When a number is multiplied by -1,it only changes its sign .

Example

5x1=5 , 10x1=10 , 5x-1=-5 1x-5=-5

5/1=5 10/1=10