UNIT 5: Limit and derivative

Specific Objectives:

1. To understand and to accept intuitive concept of limit.
2. To be able to evaluate limits of simple functions.
3. To understand the idea of derivative.
4. To be able to find the derivatives of simple functions from first principles.

Detailed Content		Time Ratio	Notes on Teaching
5.1	**Limit of a function**	3	Revision on the concept of function is expected. The concept of limit should be taught only with an intuitive approach. Tables showing infinitesimal changes may be used for illustration purposes. Use of computer printouts would be a convincing method. Examples on the existence of a limit and the non-existence of a limit should be discussed with students, however, ε–δ approach should be avoided. Limits on trigonometric functions are not required. Theorems on limits of sum, dlfference, product, quotient, scalar multiplication and composite functions should be stated without proof. Emphasis should be put on the evaluation of limit.
5.2	**Derivation of a function**	4	Students should know how to find the derivatives of simple functions from first principles. Teachers are expected to demonstrate the methods in finding derivatives of the following functions, such as x^4 ; $\sqrt{x+1}$; $x^2(x+2)$ and $\frac{x^2+x+1}{x-1}$ The format $\lim_{h\to 0}\frac{f(x+h)-f(x)}{h}$ should be stressed to facilitate smooth introduction to the concept of differentiation.
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