Class – XII
Lesson Plan 4

Topic: Application of Derivatives

Brief Description of the lesson:

In this chapter, students will study about various applications of derivatives such as rate change of bodies, increasing /decreasing functions, maxima and minima and simple problem based on application of derivatives.

Objectives:

I - Specific Objectives:

To enable the students to understand:
S1 Rate as a measure (**Knowledge/Recalling)**
S2 Increasing and decreasing functions **(Understand/Classifying)**
S3 Maxima and minima **(Apply/Implementation)**
S4 Differentiate Between Rate of change, Increasing and decreasing and Maxima and minima **(Analysis)**

II - Behavioural Objectives:

By understanding and solving variety of problems, students will attain following behavioural objectives:
1) B1 Imagination **(Apply/Implementation)**
2) B2 Systematic approach **(Apply/Implementation)**
3) B3 To handle real life situation **(Apply/Implementation)**

Process / Activities:
1) ACT1 To understand the concept of maxima-minima, with the help of graphs of different functions like linear, quadratic, cubic, rational, trigonometric, logarithmic, exponential. **(Understand/Classifying)**
2) ACT 2 To calculate profit and loss in a business using graphs. **(Apply/Implementation)**

Skills:
1) Analysis
2) Problem solving
3) Application

Assessment:
Assessment of activity will be done based on decided rubrics:
Assessment of activity will be done based on the following questions
A1 (a) Find the intervals in which the function $f(x) = 2x^3 - 9x^2 + 12x + 15$ is strictly or strictly decreasing. **(Understand/Classifying)**

A2 (b) Find the turning points of the following functions and distinguish between them. Also find the local maximum and minimum values of the functions:(i)$f(x) = 2x^3 - 21x^2 + 36x - 20$ (ii)$f(x) = x^3 - 3x^2 + 3x$ **(Apply/Implementation)**
A3 (c) An edge of a variable cube is increasing at the rate of 3 cm/s. How fast is the volume of the cube increasing when the edge is 10 cm long? **(Understand/Classifying)**

A4 (d) Using the knowledge of application of derivatives plot the graph of the function $f(x) = 3x^4 + 4x^3 - 12x^2 - 24x + 12$ **(Synthesis)**

Expected Learning Outcomes:

The students would be able to efficiently deal with:
1) Concept of Rate of change of quantities **(Knowledge/Recalling)**
2) Increasing, decreasing, strictly Increasing, strictly decreasing functions **(Understand/Classifying)**
3) finding maximum and minimum value of the function by using first order and second order derivative tests. **(Apply/Implementation)**

Placements of Objectives, Instructional Activities and Assessment:

Topic/Start Date/Assessment					
Knowledge	Understanding	Application	Analysis	Synthesis	Evaluation
S1	S2	S3	S4	A4	
	ACT1	B1			
	A1	B2			
	A3	B3			
		ACT2			
		A2			