Class – XII
Lesson Plan 3

Topic: Relations and Functions

Brief Description of the lesson:

After studying this lesson, students will be able to link pair of elements from two sets and then introduce relations between the two elements in the pair. They will learn about reflexive, symmetric, transitive and equivalence of relations and different types of Functions.

Objectives:
I - Specific Objectives:

To enable the students to:
S1 identify and analyse types of relations: reflexive, symmetric, transitive and equivalence relations **(Knowledge/Recalling) (Analysis)**

S2 identify and analyse different kind of functions (one-one, many-one, into, onto) **(Understand/Classifying) (Analysis)**

II - Behavioural Objectives:
By understanding and solving variety of problems, students will attain following behavioural objectives:
B1 To develop specific (Imaginative) problem-solving approach required in the topic through a lot of practice **(Apply/Implementation)**

B2 Develop the critical thinking skills by learning and applying different concepts learnt in variety of problems. **(Apply/Implementation)**

Process / Activities:
ACT1 To verify that the relation R in the set L of all lines in a plane, defined by R = {(l, m): l|| m} is an equivalence relation. **(Understand/Interpret)**

ACT2 To verify that the relation R in the set L of all lines in a plane, defined by R = {(l, m): l is perpendicular m} is symmetric but neither reflexive nor transitive relation. **(Understand/Interpret)**

ACT3 Graphical identification a function which is one-one, onto, into, not one-one but is onto etc. **(Understand/Interpret) (Analysis)**

Skills:
1) Imagination
2) Logical thinking
3) Analysis

Assessment:
Assessment of activity will be done based on decided rubrics:
A1 If A = {1, 2, 3} and f, g are relations corresponding to the subset of A × A indicated against them, which of f, g is a function? Why?
f = {(1, 3), (2, 3), (3, 2)}
g = {(1, 2), (1, 3), (3, 1)} **(Knowledge/Recalling)**

A2 Show that the function f: R ® R defined by $f(x) = \frac{x}{x^2+1}$ for all real x, is neither one-one nor onto. **(Apply/Implementation)**
A3 Are the following set of ordered pairs functions? If so, examine whether the mapping is injective or surjective.
(i) {(x, y): x is a person, y is the mother of x}.
(ii){(a, b): a is a person, b is an ancestor of a}.**(Analysis)**

A4 If A = {1, 2, 3, 4 }, define relations on A which have properties of being:
(a) reflexive, transitive but not symmetric
(b) symmetric but neither reflexive nor transitive
(c) reflexive, symmetric and transitive. **(Synthesis)**

Expected Learning Outcomes:

The students would be able to efficiently deal with:
1) Identify and analyse different types of relations and functions, such as reflexive, symmetric, transitive, equivalence relations, one-to-one, many-to-one, and onto functions. **(Knowledge/Recalling) (Analysis)**
2) Determining the domain, codomain, and range of relations and functions. **(Understand/Interpret)**
3) Apply relations and functions to solve real-world problems. **(Apply/Implementation)**

Placements of Objectives, Instructional Activities and Assessment:

Topic/Start Date/Assessment					
Knowledge	Understanding	Application	Analysis	Synthesis	Evaluation
S1	S2	S3	S1		
A1	ACT1	B1	S2		
	ACT2	B2	ACT3	A4	
	ACT3	A2	A3		