

# O Levels (Math D 1)

(Total Videos # 334)

## Chapter # 01

### Primes, Highest and Lowest Common Factor (44 Videos)

#### 1.1 Prime Numbers

1. Problem-Concept of Factors
2. Types of Natural Numbers
3. More on Types of Natural Numbers
4. Problem-Types of Natural Numbers
5. Prime Numbers and Composite Numbers
6. Properties of Prime Numbers
7. Index Notation
8. Problem-Index Notation
9. Prime Factorisation
10. Problem-Prime Factorization

#### 1.2 Square Roots and Cube Roots

11. Introduction to Square Root of Positive Numbers
12. Problem-Introduction to Square Root of Positive Numbers
13. The Square Root of Numbers Which are Perfect Square
14. Square Root of a Natural Number
15. Problem-Finding Square Roots By Prime Factorization
16. Concept of Cubes and Perfect Cubes
17. Problem-Concept of Cubes and Perfect Cubes
18. Cubes and Cube Roots
19. Problem-Cube Roots of Numbers which are Perfect Cubes
20. Proving Square Root of Prime Number is Irrational Number

#### 1.3 Highest Common Factor and Lowest Common

21. Least Common Multiple (LCM)
22. Problem-Least Common Multiple ( LCM )
23. Find LCM of Four Numbers Up to 2-Digits
24. Problem-Find LCM of Four Numbers Up to 2-Digits
25. LCM by Prime Factorization Method
26. Problem-LCM by Prime Factorization Method
27. LCM by Short Division Method
28. Problem-LCM by Short Division Method
29. Highest Common Factors ( HCF )

- 30. Problem-Highest Common Factors ( HCF )
- 31. Find HCF of Three Numbers, Up to 2-Digits
- 32. Problem-Find HCF of Three Numbers, Up to 2-Digits
- 33. Finding HCF By Prime Factorization Method
- 34. Problem-Finding HCF By Prime Factorization Method
- 35. Finding HCF By Using Division Method
- 36. Problem-Finding HCF By Using Division Method
- 37. Relation Between HCF and LCM of Two Numbers
- 38. Problem-Relation Between HCF and LCM of Two Numbers
- 39. Solve the Real Life Problems Involving HCF and LCM
- 40. Problem-Solve the Real Life Problems Involving HCF and LCM

#### **1.4 Application of HCF and LCM**

- 41. Application of HCF Problem-1
- 42. Application of HCF Problem-2
- 43. Application of LCM Problem-1
- 44. Application of LCM Problem-2

## **Chapter # 02**

### **Integers, Rational Numbers and Real Numbers (38**

**Videos)**

#### **2.1 Negative Numbers**

- 1. Problem-Positive, Negative and Natural Integers or Directed Numbers
- 2. Positive, Negative and Natural Integers or Directed Numbers
- 3. Problem-Representing Integers on the Number Line

#### **2.2 Addition and Subtraction Involving Negative Numbers**

- 4. Sum of Two or More Given Integers or Directed Numbers
- 5. Problem-Sum of Two or More Given Integers or Directed Numbers
- 6. Sum of Two Integers or Directed Numbers With Unlike Signs
- 7. Problem-Sum of Two Integers or Directed Numbers With Unlike Signs
- 8. Sum of Two Integers or Directed Numbers With like Signs
- 9. Rule of Sum of Two Integers With like Signs
- 10. Problem-Rule of Sum of Two Integers With like Signs
- 11. Rule of Sum of Two Integers With Unlike Signs
- 12. Problem-Rule of Sum of Two Integers With Unlike Signs
- 13. Difference of Two Given Positive Integers or Directed Numbers
- 14. Problem-Difference of Two Given Positive Integers or Directed Numbers

#### **2.3 Multiplication and Division Involving Negative Numbers**

- 15. Multiplication of Integers or Directed Numbers With Like Signs
- 16. Problem-Multiplication of Integers or Directed Numbers With Like Signs
- 17. Multiplication of Integers or Directed Numbers With Unlike Signs

18. Prob-Multiplication of Integers or Directed Numbers With Unlike Signs
19. Division of Integers or Directed Numbers with Like Signs
20. Problem-Division of Integers or Directed Numbers with Like Signs
21. Division of Integers or Directed Numbers with Unlike Signs
22. Problem-Division of Integers or Directed Numbers with Unlike Signs
23. Division of an Integers or Directed Numbers by 0 is Not Possible
24. Problem-Division of an Integers or Directed Numbers by 0 is Not Possi
25. Simplifying Expressions Involving Integers or Directed Numbers

## **2.4 Rational Numbers and Real Numbers**

26. Percentages, Fractions and Decimals
27. Conversion of Decimals to Rational Numbers
28. Problem-Conversion of Decimals to Rational Numbers
29. Terminating Decimals
30. Problem-Terminating Decimals
31. Non-terminating Decimals
32. Problem-Non-terminating Decimals
33. Concept of Rational Numbers
34. Problem-Concept of Rational Numbers
35. Representation of Rational Number on a Number Line
36. Problem-Representation of Rational Number on a Number Line
37. Introduction to Real Numbers
38. Problem-Concept of Real Numbers

# **Chapter # 03**

## **Approximation and Estimation (08 Videos)**

### **3.1 Approximation**

1. Rounding Off a Number to a Given Number of Decimal Places
2. More on Rounding Off a Number

### **3.2 Significant Figures**

3. Accuracy and Significant Figures
4. Introduction to Significant Figures
5. Rounding a Number to a Given Number of Significant Figures

### **3.3 Rounding and Truncation Errors**

6. Rounding and Truncation Errors

### **3.4 Estimation**

7. Estimation and Rounding
8. Approximations in Measurements and Accuracy

# Chapter # 04

## Basic Algebra and Algebraic Manipulation (22

Videos)

### 4.1 Fundamental Algebra

1. Introduction to Algebra
2. Problem-Introduction to Algebra
3. Notation in Algebra
4. Introducing Variable and Constant
5. Algebraic Expressions & Algebraic Sentences
6. Introduction to Algebraic Expressions
7. Problem-Introduction to Algebraic Expressions
8. Evaluation of Algebraic Expressions
9. Problem-Evaluation of Algebraic Expressions
10. Row-Wise Addition of Algebraic Expressions
11. Problem-Row-Wise Addition of Algebraic Expressions
12. Column-Wise Addition of Algebraic Expressions
13. Problem-Column-Wise Addition of Algebraic Expressions
14. Row-Wise Subtraction of Algebraic Expressions
15. Problem-Row-Wise Subtraction of Algebraic Expressions
16. Column-Wise Subtraction of Algebraic Expressions
17. Problem-Column-Wise Subtraction of Algebraic Expressions
18. Simplification of Algebraic Expressions
19. Problem-Simplification of Algebraic Expressions

### 4.2 Simplification of Linear Expressions wi

20. Linear Algebraic Expressions with Fractional Coefficients

### 4.3 Factorisation

21. Factorization
22. Problem-Factorization

# Chapter # 05

## Linear Equation and Simple Inequalities (24

Videos)

### 5.1 Linear Equations

1. Linear Equations in one, two and three variables
2. Problem-Introduction to Linear Equations
3. Recognizing and formation of Linear Equations in One and Two Variabl

4. Solution of a Linear Equation in Two Unknowns
5. Solution of Two Linear Equations Involving Two Variables
6. Problem-Solution of Two Equations Involving Two Variables
7. Problems Involving Linear Equations in Two Variables
8. Solving Fractional Linear Equations
9. Problem-Solving Fractional Linear Equations

## 5.2 Formulae

10. Product of Binomial with Same First Term
11. Problem-Product of Binomial with Same First Term
12. Introduction to Algebraic Identities
13. Problem-Introduction to Algebraic Identities
14. Product of Same Binomial
15. More on Product of Same Binomial
16. Problem-Product of Same Binomial
17. Difference of Square of Two Terms
18. Problem1-Difference of Square of Two Terms
19. Problem2-Difference of Square of Two Terms

## 5.3 Application of Linear Equation In Real

20. Word Problem-1 of Linear Equation
21. Word Problem-2 of Linear Equation

## 5.4 Simple Inequalities

22. Equations and Inequalities
23. Introducing Linear Inequality
24. Problem-Introducing Linear Inequality

# Chapter # 06

## Functions and Linear Graphs (71 Videos)

### 6.1 Cartesian Coordinates

1. Cartesian Coordinate System & Cartesian Plane
2. Problem on Cartesian Coordinate System & Cartesian Plane

### 6.2 Functions

3. Introduction to Function
4. More on Introduction to Functions
5. Problem on Introduction to Function
6. Problem2-Introduction to Function
7. Problem3-Introduction to Function
8. Problem4-Introduction to Function
9. Implied Domain
10. Finding Domain and Range of Functions
11. Operations on Functions

12. Into Function
13. Problem on Into Function
14. Problem2-Into Function
15. Onto Function
16. Problem on Onto Function
17. Problem2-Onto Function
18. One to One Function
19. Problem on One to One Function
20. Problem2-One to One Correspondence
21. Bijective Function
22. Problem on Bijective Function
23. Problem2-Bijective Function
24. Injective Function
25. Problem on Injective Function
26. Problem2-Injective Function
27. One-One Function
28. Problem-One-One Function
29. Set Builder Notation for a Function
30. Problem-Set Builder Notation for a Function

### **6.3 Kinds of Functions**

31. Formulization of Functions
32. Algebraic Functions
33. Linear and Quadratic Functions
34. Problem-Linear and Quadratic Functions
35. Inverse of a Function
36. More on Inverse of a Function
37. Problem1-Inverse of a Function
38. Problem2-Inverse of a Function
39. Domain & Range of Inverse Function
40. Square Root and Absolute Value Functions
41. Problem-Square Root and Absolute Value Functions
42. Common Types of Functions
43. Problem-Constant, Identity and Rational Functions
44. Even and Odd Functions
45. Problem-Even and Odd Functions
46. Trigonometric Functions
47. More on Trigonometric Functions
48. The Radian Function
49. Introduction to Binary Operations
50. More on Inverse Trigonometric Functions
51. Further to Inverse Trigonometric Functions
52. Operations on Residue Classes Modulo  $n$
53. Properties of Binary Operations
54. More on Logarithmic Functions
55. Problem-Hyperbolic Functions
56. Inverse Hyperbolic Functions

- 57. Inverse Hyperbolic Functions
- 58. Explicit and Implicit Functions
- 59. Parametric Functions
- 60. Problem-Parametric Functions
- 61. The Modulus of a Function

#### **6.4 Graphs of Linear Functions**

- 62. Constructing table for linear equation in two variables
- 63. Scale of Graph
- 64. Problem-Scale of Graph
- 65. Drawing graph with given slopes & intercepts
- 66. Problem1-Drawing graph with given slopes & intercepts
- 67. Problem2-Drawing graph with given slopes & intercepts
- 68. Drawing graph from a give table of discrete values
- 69. Problem-Drawing graph from a give table of discrete values

#### **6.5 Applications of Linear Graphs in Real w**

- 70. Solving real life problems by graph
- 71. Problem-Solving real life problems by graph

## **Chapter # 07**

### **Number Patterns (05 Videos)**

#### **7.1 Number Sequences**

- 1. Number Sequences

#### **7.2 General Term of a Number Sequence**

- 2. General Term in a Number Sequence
- 3. Problem Solving

#### **7.3 Number Patterns in Real World Contexts**

- 4. Problem Solving
- 5. Number Sequences

## **Chapter # 08**

### **Percentage (12 Videos)**

#### **8.1 Introduction to Percentage**

- 1. Percentages, Fractions and Decimals
- 2. Concept of Percentage
- 3. Problem-Concept of Percentage
- 4. Expressing one Quantity as a Percentage of Another

5. Finding the Percentage of a Number
6. Problem on Percentage by Using Unitary Method
7. Problem on Percentage by Using Proportion
8. Solve Real Life Problems Involving Percentages
9. Problem-Solve Real Life Problems Involving Percentages
10. Comparing Two Quantities by Percentages
11. Ordering fractions using percentage

## 8.2 Percentage Change and Reverse Percentage

12. Increasing or Decreasing a Quantity by a given Percentage

# Chapter # 09

## Ratio, Rate, Time and Speed (15 Videos)

### 9.1 Ratio

1. Introducing Ratio
2. Problem-Concept of Ratio
3. Equivalent Ratios
4. Problem-Equivalent Ratios
5. Concept of Continued Ratio
6. Problem-Concept of Continued Ratio

### 9.2 Rate

7. Rate
8. Problem-Concept of Rate
9. Average Rate

### 9.3 Time

10. Time

### 9.4 Speed

11. Conversion of Units of Speed
12. More on Conversion of Units of Speed
13. Problem-Conversion of Units of Speed
14. Speed and Average Speed
15. Problems Involving Speed and Average Speed

# Chapter # 10



# **Basic Geometry** (18 Videos)

## **10.1 Points, Lines and Planes**

1. Introduction to Point, Line, Line-segment and Ray
2. Problem 1: Introduction to Point, Line, Line-segment and Ray
3. Intersecting Lines
4. Planes

## **10.2 Angles**

5. Introduction to an Angle
6. Measuring an Angle in Sexagesimal System
7. Problem1-Measuring an Angle in Sexagesimal System
8. Kinds of an Angle
9. Perpendicular- Parallel lines
10. Problem 1: Perpendicular and parallel lines
11. Concept of Complementary Angles
12. Concept of Supplementary Angles
13. Vertically Opposite Angles
14. Finding Unknown Angles Involving Vertically Opposite Angles

## **10.3 Angles Formed by Two Parallel lines and**

15. Concept of Corresponding Angles
16. Concept of Alternate Interior Angles
17. Concept of Interior Angles
18. Problem- Finding Angles Formed by a Transversal

# **Chapter # 11**

## **Triangles, Quadrilaterals and Polygons** (14 Videos)

### **11.1 Triangles**

1. Kinds of Triangle
2. Problem 1: Kinds of Triangle
3. Triangle Sum Theorem
4. Interior and exterior angles of triangle
5. Problem 1: Interior and exterior angles of triangle
6. Exterior Angle Theorem

### **11.2 Quadrilaterals**

7. Quadrilateral and its types
8. Problem 1: Quadrilateral and its types

### **11.3 Polygons**

9. Polygons
10. Concept of Polygon

11. Demonstrate the properties of a parallelogram
12. Concept of Regular Pentagon, Hexagon & Octagon
13. Sum of Interior Angles of a Convex polygon
14. Sum of Exterior Angles of a Convex Polygon

## Chapter # 12

### Geometrical Constructions (21 Videos)

#### **12.1 Introduction to Geometrical Construction**

1. Introduction to Practical Geometry
2. Instruments of geometry box

#### **12.2 Perpendicular Bisectors and Angle Bisec**

3. Right Bisector of Line Segment & Angle
4. Theorem Point on Right Bisector of a Line Segment
5. Problem 1: If two lines intersect each other, then vertical angles are
6. Theorem Point on Bisector of an Angle

#### **12.3 Construction of Triangles**

7. Draw triangles using attributes
8. Construct equilateral triangle using protractor and ruler (A.S.A)
9. Construct isosceles triangle using protractor and ruler (A.S.A)
10. Construct scalene triangle using protractor and ruler (A.S.A)
11. Construct triangle when three sides are given
12. Construct acute triangle (S.A.S)
13. Construct right triangle (S.A.S)
14. Construct obtuse triangle (S.A.S)
15. Constructing Triangle when three sides are Given
16. Construction of Triangle with 1 Angle & 2 Sides
17. Constructing Triangle with 1 Side & 2 Angles

#### **12.4 Construction of Quadrilaterals**

18. Draw rectangles using attributes
19. Draw square using attributes
20. Draw pentagon using attributes
21. Draw hexagon using attributes

## Chapter # 13

### Perimeter and Area of Plane Figures (12 Videos)

### **13.1 Conversion of Units**

1. Concept of Altitude of a Geometrical Figures
2. Area of a Triangle

### **13.2 Perimeter and Area of Basic Plane Figur**

3. Formula for Perimeter of a Square & Rectangle
4. Formula for Area of a Square & Rectangle
5. Area of a Triangle
6. Word Problem of Area of a Triangle
7. Area of a Circular Region
8. Measurement of the Circumference of a Circle

### **13.3 Perimeter and Area of Parallelograms**

9. Area of a Parallelogram
10. Word Problem of Area of a Parallelogram

### **13.4 Perimeter and Area of Trapezium**

11. Area of a Trapezium
12. Word Problem of Area of a Trapezium

## **Chapter # 14**

### **Volume and Surface Area of Prisms and Cy (11 Videos)**

#### **14.1 Volume and Surface Area of Cubes and Cu**

1. Volume of Cubes
2. Volume of Cuboids
3. Surface Area of Cuboids
4. Surface Area of Cubes

#### **14.2 Volume and Surface Area of Prisms**

5. Right Prism
6. Volume of Prism
7. Surface Area of a Prism

#### **14.3 Volume and Surface Area of Cylinders**

8. Volume of a Cylinder
9. Volume of a Cylinder By Making a Cuboid
10. Volume of a Cylinder By Staking Coins
11. Surface Area of the Cylinder

## **Chapter # 15**

## **Statistical Data Handling** (19 Videos)

### **15.1 Introduction to Statistics**

1. Introduction to Information Handling

### **15.2 Pictograms and Bar Graphs**

2. Data and its Types
3. Problem-Data and its Types
4. Classification of a Data
5. Problem-Classification of a Data
6. Collection and Presentation of Data
7. Problem on Data, Collection of Data, Presentation of Data
8. Introduction to Graph
9. Draw Block or Column Graphs
10. Block Graph
11. Reading bar graph
12. Problem-Vertical Bar Graph
13. Horizontal Bar Graph
14. Word Problem of Bar Graph-p1
15. Word Problem of Bar Graph-p2
16. Pictograms

### **15.3 Pie Charts**

17. Introduction to Pie Graph
18. Word Problem of Pie Graph

### **15.4 Line Graphs**

19. Line Graphs

## **O Levels (Math D 2)**

**(Total Videos # 309)**

# Chapter # 01

## Direct and Inverse Proportions (12 Videos)

### 1.1 Direct Proportion

1. Direct Proportion
2. Problem-Direct Proportion
3. Solving Problem Involving Direct Proportion
4. Solving Word Problem by Using Unitary Method

### 1.2 Algebraic and Graphical Representations

5. Graphical Representation of Direct Proportion

### 1.3 Other Forms of Direct Proportion

6. Other Forms of Direct Proportion

### 1.4 Inverse Proportion

7. Inverse Proportion
8. Problem-Inverse Proportion
9. Solving Problem Involving Inverse Proportion
10. Solving Word Problem by Using Proportion Method

### 1.5 Algebraic and Graphical Representations

11. Graphical Representation of Inverse Proportion

### 1.6 Other Forms of Inverse Proportion

12. Other Forms of Inverse Proportion

# Chapter # 02

## Linear Graphs and Simultaneous Linear Eq (22 Videos)

### 2.1 Gradient of a straight line

1. Equations of a Straight Line
2. Gradient of a Straight Line

### 2.2 Further applications of linear graphs i

3. Travel Graphs

### 2.3 Graphs of linear equations in the form

4. Constructing table for linear equation in two variables
5. Scale of Graph
6. Problem-Scale of Graph

- 7. Drawing graph with given slopes & intercepts
- 8. Problem1-Drawing graph with given slopes & intercepts
- 9. Problem2-Drawing graph with given slopes & intercepts
- 2.4 Solving simultaneous linear equations u**
  - 10. Solving Simultaneous Linear Equations Graphically
  - 11. Scale of Graph
  - 12. Problem-Scale of Graph
  - 13. Coincident Points & Coincident Lines
  - 14. Perpendicular- Parallel lines
  - 15. Problem 1: Perpendicular and parallel lines
- 2.5 Solving simultaneous linear equations u**
  - 16. Solving Simultaneous Linear Equations-Equating-Co-efficient
  - 17. Solving Simultaneous Linear Equations by Substitution
  - 18. Problem 1: Solving Simultaneous Linear Equations by Substitution
- 2.6 Applications of simultaneous equations in real-world contexts**
  - 19. Solving Simultaneous Linear Equations -p1
  - 20. More on Solving Simultaneous Linear Equations -p1
  - 21. Solving Simultaneous Linear Equations -p2
  - 22. More on Solving Simultaneous Linear Equations -p2

## Chapter # 03

### Expansion and Factorization of Quadratic (18

Videos)

- 3.1 Quadratic Expressions**
  - 1. Introducing Algebraic Expression
  - 2. Linear Algebraic Expressions with Fractional Coefficients
- 3.2 Expansion and Simplification of Quadratic**
  - 3. Addition of Algebraic Expression
  - 4. Problem 1: Addition of Algebraic Expression
  - 5. Subtraction of Polynomials
  - 6. Product of Algebraic Expression
  - 7. Problem 1: Product of Algebraic Expression
  - 8. Division of Algebraic Expression
  - 9. Problem 1: Division of Algebraic Expression
  - 10. Product of Same Binomial
  - 11. More on Product of Same Binomial
  - 12. Problem-Product of Same Binomial
- 3.3 Factorization of Quadratic Expressions**

13. Factorization of Quadratic Expressions
14. Factoring Quadratic Equation-Leading Coefficient-1
15. Problem-Factoring Quadratic Equation-Coefficient1
16. Factoring Quadratic Polynomial-Non-1 Leading Coefficient
17. Problem1-Factoring Quadratic Polynomial-Non-1 Leading Coefficient
18. Problem2-Factoring Quadratic Polynomial-Non-1 Leading Coefficient

## Chapter # 04

### Further expansions and factorization of (15 Videos)

#### 4.1 Expansion using special algebraic ident

1. Product of Same Binomial
2. More on Product of Same Binomial
3. Problem-Product of Same Binomial
4. Difference of Square of Two Terms
5. Problem1-Difference of Square of Two Terms
6. Problem2-Difference of Square of Two Terms
7. Application of Difference of Square of Two Terms

#### 4.2 Factorization using special algebraic i

8. Formulae
9. Construction of Formulae
10. Writing Algebraic Expressions
11. Square of Sum of Two Terms
12. Problem 2: Square of Sum of Two Terms
13. Problem 1: Square of Sum of Two Terms
14. Square of Difference of Two Terms
15. Difference of Square of Two Terms

## Chapter # 05

### Quadratic Equations and Graphs (16 Videos)

#### 5.1 Solving quadratic equations by factoriz

1. Quadratic Equations in 1 Variable
2. Problem-Quadratic Equations in 1 Variable
3. Solving Quadratic Equations by Factorization
4. Problem-Solving Quadratic Equations by Factorization
5. Solving Quadratic Equations-Completing Squares
6. Problem1-Solving Quadratic Equations-Completing Squares
7. Problem1-Solving Quadratic Equations-Completing Squares

8. Solving Quadratic Equation-Quadratic Formula
9. Problem1-Solving Quadratic Equation-Quadratic Formula
10. Problem2-Solving Quadratic Equation-Quadratic Formula
11. Problem-Solving Involving Quadratic Equations

## 5.2 Applications of quadratic equations in

12. Problem on Problem Leading to Quadratic Equations.

## 5.3 Graphs of quadratic functions

13. Quadratic Equations in Two Variables of the Form  $y = ax^2$
14. Graph of General Quadratic Equations in Two Variables
15. Problem Involving Quadratic Graphs
16. Graphical Solution of Quadratic Equations

# Chapter # 06

## Algebraic fractions and formulae (06 Videos)

### 6.1 Algebraic fractions

1. Use of Brackets in Simplification

### 6.2 Multiplication and division of algebrai

2. Dividing & Multiplying Algebraic Expressions

### 6.3 Addition and subtraction of algebraic f

3. Adding and Subtracting Algebraic Expressions

### 6.4 Manipulation of algebraic formulae

4. Changing the Subject of a Formula
5. Further Examples on Changing the Subject of a Formula
6. Finding an Unknown in a Formula

# Chapter # 07

## Relations and functions (09 Videos)

### 7.1 Relations

1. Types of Relations

### 7.2 Functions

2. Introduction to Function
3. More on Introduction to Functions
4. Problem on Introduction to Function



5. Problem2-Introduction to Function
6. Problem3-Introduction to Function
7. Problem4-Introduction to Function
8. Finding Domain and Range of Functions
9. Introducing Dependent and Independent Variables

## Chapter # 08

### Congruence and similarity (16 Videos)

#### 8.1 Congruent figures

1. Congruent Figures and Objects
2. Problem-Congruent Figures and Objects
3. Congruency Tests
4. Problem-Congruency Tests
5. Congruent Triangles

#### 8.2 Similar figures

6. Similar Triangles
7. Problem-Similar Triangles
8. Similar Figures and Objects

#### 8.3 Similarity, enlargement and scale drawi

9. Similarity and Enlargement
10. Problem-Similarity and Enlargement
11. Similarity and Scale Drawings
12. Test for Similarity between two triangles
13. Polygons
14. Condition of Similarity of 2 Polygons
15. Problem-Condition of Similarity of 2 Polygons
16. Constructing Similar Triangles

## Chapter # 09

### Geometrical transformation (06 Videos)

#### 9.1 Rotation

1. Rotation of Axes
2. More on Rotation of Axes

3. Problem1- Rotation of axis

## 9.2 Translation

4. Translation of Axes

5. Problem1-Translation of Axes

6. Problem2-Translation of Axes

# Chapter # 10

## Pythagoras' Theorem (06 Videos)

### 10.1 Pythagoras' Theorem

1. Pythagoras Theorem

2. Problem1-Pythagoras Theorem

3. Problem2-Pythagoras Theorem

### 10.2 Applications of Pythagoras' theorem in

4. Solution of Right Angle Triangle through Pythagoras Theorem

### 10.3 Converse of Pythagoras' theorem

5. Converse of Pythagoras Theorem

6. Problem-Converse of Pythagoras Theorem

# Chapter # 11

## Trigonometric ratios (41 Videos)

### 11.1 Trigonometric ratios

1. Trigonometric Ratios of 45 Degree

2. Problem-Trigonometric Ratios of 45 Degree

3. Trigonometric Ratios of 30 & 60 Degree

4. Problem1-Trigonometric Ratios of 30 & 60 Degree

5. Problem2-Trigonometric Ratios of 30 & 60 Degree

6. Signs of Trigonometric Ratios in Different Quadrants

7. Problem1-Signs of Trigonometric Ratios in Different Quadrant

8. Problem2-Signs of Trigonometric Ratios in Different Quadrant

9. Trigonometric Functions for a Unit Circle

10. Values of Remaining Trigonometric Ratios

11. Values of Trigonometric Ratios at Quadrantal Angle

12. Problem-Values of Trigonometric Ratios at Quadrantal Angle

13. Values of Trigonometrical Ratios

14. Use of Calculator

15. Tables of Trigonometric Ratios
16. Problem1-Tables of Trigonometric Ratios
17. Problem2-Tables of Trigonometric Ratios
18. Problem3-Tables of Trigonometric Ratios
19. Problem4-Tables of Trigonometric Ratios

### **11.2 Applications of trigonometric ratios**

20. Problem 1: when measures of hypotenuse and one angle are given
21. Problem 1: When measures of two sides are given

### **11.3 Applications of trigonometric ratios**

22. Solving Right-Angled Triangles by Trigonometric Ratios
23. Heights and Distances

### **11.4 Applications of trigonometric ratios in**

24. Concept of Angle of Elevation & Depression
25. Problem-Concept of Angle of Elevation & Depression
26. Engineering and Heights and Distances
27. More on Engineering and Heights and Distances
28. Problem1-Engineering and Heights and Distances
29. Problem2-Engineering and Heights and Distances
30. Word problem when one Side and Angle of Elevation are Given
31. Problem-When one Side & Angle of Elevation are Given
32. Heights and Distances
33. Problem-Heights and Distances
34. Word problem when one Side and Angle of Depression are Given
35. Problem1-when One Side & Angle of Depression are Given
36. Problem2-when One Side & Angle of Depression are Given
37. Word problem when Hypotenuse and Angle of Elevation are Given
38. Problem-when Hypotenuse & Angle of Elevation are Given
39. Word Problem with given Sides-Angle of Elevation-Depression
40. Problem1-when Given Sides-Angle of Elevation-Depression
41. Problem2-when Given Sides-Angle of Elevation-Depression

## **Chapter # 12**

### **Volume and surface area of pyramids, con (11 Videos)**

#### **12.1 Volume and surface area of pyramids**

1. Pyramids
2. Volume of Pyramids

3. Total Surface Area of Pyramid

## 12.2 Volume and surface area of cones

4. Cones
5. Volume of Cones
6. Comparison Between Pyramid and Cone
7. Surface Area of Cones

## 12.3 Volume and surface area of spheres

8. Volume of Sphere
9. Surface Area of Sphere

## 12.4 Volume and surface area of composite so

10. Volume of a Cylinder
11. Surface Area of a Cylinder

# Chapter # 13

## Symmetry (05 Videos)

### 13.1 Line symmetry

1. Line of symmetry
2. Identify all lines of symmetry of a shape
3. Reflexive symmetry

### 13.2 Rotational symmetry in plane figures

4. Rotational symmetry
5. Point of rotation and order of rotational symmetry

# Chapter # 14

## Sets (61 Videos)

### 14.1 Introduction to set notations

1. Set Definition
2. Problem-Set Definition
3. Set Notation & its Characteristics
4. Problem-Set Notation & its Characteristics
5. Some Important Sets of Numbers

6. Presentation of a Set
7. Set Builder Notation
8. Problem-Describing a Set
9. Empty Set & Singleton Set
10. Problem on Empty Set & Singleton Set
11. Problem-Empty Set & Singleton Set
12. Equal & Equivalent Sets
13. Problem on Equal & Equivalent Sets

## **14.2 Venn diagrams, universal sets and compl**

14. Introduction to Venn Diagrams
15. Problem on Introduction to Venn Diagrams
16. Universal Set
17. Subset Definition
18. Problem on Subset Definition
19. Problem-Subset Definition
20. Proper Subset & Improper Subset
21. Problem on Proper Subset & Improper Subset
22. Power Set
23. Problem on Power Set
24. Complement of a Set
25. Problem-Complement of a Set

## **14.3 Intersection of two sets**

26. Intersection of Set
27. Problem on Intersection of Set

## **14.4 Union of two sets**

28. Union of Two Sets
29. Problem on Union of Two Sets

## **14.5 Combining universal set, complement of**

30. Commutative Law of Union of Sets
31. Problem-Commutative Law of Union of Sets
32. Commutative Law of Intersection of Sets
33. Problem-Commutative Law of Intersection of Sets
34. Intersection Associativity for Overlapping Sets
35. Problem on Intersection Associativity for Overlapping Sets
36. Intersection Associativity for Disjoint Sets
37. Problem on Intersection Associativity for Disjoint Sets
38. Intersection Associativity for Sets
39. More on Intersection Associativity for Sets
40. Problem on Intersection Associativity for Sets
41. Problem on More on Intersection Associativity for Sets
42. Union Associativity for Overlapping Sets
43. Problem on Union Associativity for Overlapping Sets
44. Union Associativity for Disjoint Sets
45. Problem on Union Associativity for Disjoint Sets
46. Union Associativity for Sets

47. Problem on Union Associativity for Sets
48. More on Union Associativity for Set
49. Problem on More on Union Associativity for Set
50. Distributivity of Union Over Intersection of Sets
51. Problem on Distributivity of Union Over Intersection of Sets
52. Distributivity of Intersection Over Union of Sets
53. Problem on Distributivity of Intersection Over Union of Sets
54. Introducing Field
55. Problem-Introducing Field
56. Difference of Sets for Overlapping Sets
57. Problem on Difference of Sets for Overlapping Sets
58. Difference of Sets for Disjoint Sets
59. Problem on Difference of Sets for Disjoint Sets
60. Difference of Sets for a Set & its Subset
61. Problem on Difference of Sets for a Set & its Subset

# Chapter # 15

## Probability of single events (19 Videos)

### **15.1** Introduction to probability

1. Introduction to Probability
2. Problem-Introduction to Probability
3. Definition of Probability
4. Problem-Definition of Probability

### **15.2** Sample space

5. Experiments and Sample Space
6. Problem-Experiments and Sample Space

### **15.3** Probability of single events

7. Problem Solving Strategies in Probability
8. Possible Outcomes in the Sample Space
9. Problem-Possible Outcomes in the Sample Space

### **15.4** Further examples on probability of sing

10. Multiplication of Probabilities and Independent Events
11. More on Multiplication of Probabilities and Independent Events
12. Problem-Multiplication of Probabilities of Independent Events
13. Addition of Probabilities of Overlapping Events
14. Problem-Addition of Probabilities of Overlapping Events
15. Addition of Probabilities of Disjoint Events
16. Addition of Probabilities of Subset Events
17. Problem-Addition of Probabilities of Subset Events
18. Multiplication of Probabilities of n Independent Events

# Chapter # 16

## Statistical diagrams (15 Videos)

### 16.1 Statistical diagrams

1. Pictograms
2. Reading bar graph
3. Problem-Vertical Bar Graph
4. Horizontal Bar Graph
5. Introduction to Pie Graph
6. Word Problem of Pie Graph
7. Line Graphs

### 16.2 Dot diagrams

8. Dot Diagram

### 16.3 Stem-and-leaf diagrams

9. Stem and Leaf Diagram

### 16.4 Histograms for ungrouped data

10. Constructing Histogram with Equal Intervals
11. Problem on Constructing Histogram with Equal Intervals

### 16.5 Histograms for grouped data

12. Constructing Histogram with Unequal Intervals
13. Problem on Constructing Histogram with Unequal Intervals
14. Construction of Frequency Polygon
15. Problem on Construction of Frequency Polygon

## O Levels (Math D 3)

(Total Videos # 259)

# Chapter # 01

## Quadratic Equations and Function (16 Videos)

## **1.1 Solving Quadratic Equations by Completi**

1. Solving Quadratic Equations-Completing Squares
2. Problem1-Solving Quadratic Equations-Completing Squares
3. Problem2-Solving Quadratic Equations-Completing Squares

## **1.2 Solving Quadratic Equations by Using th**

4. Solving Quadratic Equation-Quadratic Formula
5. Problem1-Solving Quadratic Equation-Quadratic Formula
6. Problem2-Solving Quadratic Equation-Quadratic Formula
7. Problem-Solving Involving Quadratic Equations

## **1.3 Solving Quadratic Equations by Graphica**

8. Graphical Solution of Quadratic Equations

## **1.4 Solving Fractional Equations that can b**

9. Solving Rational Equations
10. Solving Reciprocal Algebraic Equation
11. Problem-Solving Reciprocal Algebraic Equation

## **1.5 Application of Quadratic Equations in R**

12. Exponential Modelling
13. Problem1-Exponential Modelling
14. Problem2-Exponential Modelling

## **1.6 Graph of Quadratic Equation**

15. Graphs of the form  $y = \pm (x - a)(x - b)$
16. Graphs of the form  $y = \pm (x - p)(x - p) + q$

# **Chapter # 02**

## **Further Functions (08 Videos)**

### **2.1 Functions involving Higher Order Expres**

1. Solving Equation Having Degree 2n
2. Problem-Solving Equation Having Degree 2n
3. Problem2-Solving Equation Having Degree 2n

### **2.2 Inverse Functions**

4. Inverse of a Function
5. More on Inverse of a Function
6. Problem1-Inverse of a Function
7. Problem2-Inverse of a Function
8. Domain & Range of Inverse Function



# Chapter # 03

## Linear Inequalities in One Variable (29 Videos)

### 3.1 Inequalities

1. Trichotomy Property of Inequality
2. Problem1-Trichotomy Property of Inequality
3. Problem2-Trichotomy Property of Inequality
4. Archimedian Property of Inequality
5. Transitive property of Inequality
6. Problem1-Transitive property of Inequality
7. Problem2-Transitive property of Inequality
8. Additive property of inequality
9. Problem-Additive property of inequality
10. Multiplicative Property of Inequality
11. Problem1-Multiplicative Property of Inequality
12. Problem2-Multiplicative Property of Inequality
13. Inequality multiplicative Inverse
14. Problem-Inequality multiplicative Inverse

### 3.2 Problem Solving Involving Inequalities

15. Solution of Inequalities
16. Problem-Solution of Inequalities
17. Representing Solution of Inequalities on Number Line
18. Problem 1: Representing Solution of Inequalities on Number Line
19. Inequations with Modulus Sign
20. Equations and Inequalities
21. Introducing Linear Inequality
22. Problem-Introducing Linear Inequality

# Chapter # 04

## Indices and Standard Form (45 Videos)

### 4.1 Indices

1. Exponent or Index Definition
2. Problem-Exponent or Index Definition

### 4.2 Laws of Indices

3. Law of Sum of Power of Exponents

4. Problem-Law of Sum of Power of Exponents
5. Law of Quotient of Power with Same Base
6. Problem-Law of Quotient of Power with Same Base
7. Law of Power of Product of Exponent
8. Problem-Law of Power of Product of Exponent
9. Law of Power of Power of Exponent
10. Problem-Law of Power of Power of Exponent
11. Law of Power of a Fraction
12. Problem-Law of Power of a Fraction

### **4.3 Zero and Negative Indices**

13. Zero and negative Indices
14. Prove of  $x$  raise to power zero is one
15. Problem-Prove of  $x$  raise to power zero is 1
16. Applications of Laws of Exponents
17. Problem-Applications of Laws of Exponents

### **4.4 Rational Indices**

18. Introduction to Rational Exponents
19. Problem-Introduction to Rational Exponents
20. Properties of rational exponents
21. Problem-Properties of rational exponents
22. Introduction to Surds
23. Problem-Introduction to Surds
24. Order of a Surd
25. Order of a Surd
26. Addition and subtraction of surds
27. Problem1-Addition and subtraction of surds
28. Problem2-Addition and subtraction of surds
29. Multiplication and Division of Surds
30. Problem1-Multiplication and Division of Surds
31. Problem2-Multiplication and Division of Surds
32. Problem2-Rationalizing denominator

### **4.5 Standard Form**

33. Introduction to Scientific Notation
34. Problem-Introduction to Scientific Notation
35. Converting Scientific to Common form
36. Problem-Converting Scientific to Common form
37. Movement of Decimal in Scientific Notation
38. Converting common to scientific form

### **4.6 Operations on Scientific Notation**

39. Adding & Subtracting Scientific Notation
40. Problem 1: Adding & Subtracting Scientific Notation
41. Multiplication of Numbers in Scientific Notation
42. Problem 1: Multiplication of Numbers in Scientific Notation
43. Division of Numbers in Scientific Notation
44. Problem 1: Division of Numbers in Scientific Notation

45. Common Prefixes used in everyday life situations

# Chapter # 05

## Application of Mathematics in Practical (29 Videos)

### 5.1 Profit and Loss

1. Introduction to Profit
2. Problem1-Introduction to Profit
3. Problem2-Introduction to Profit
4. Introduction to Loss
5. Problem1-Introduction to Loss
6. Profit and Loss as a percentage of Cost/Sale Price
7. Further Examples on Percentage
8. Problem1-Profit and Loss as a percentage of Cost/Sale Price
9. Problem2-Profit and Loss as a percentage of Cost/Sale Price

### 5.2 Discount, Taxation and Commission

10. Discount
11. Problem1-Discount
12. Marked Price and List Price
13. Relations Regarding Discount
14. Problem1-Relations Regarding Discount
15. Problem2-Relations Regarding Discount
16. Problem-Real Life Problem Regarding Discount
17. Value-added Tax and GST
18. Problem4-Taxation
19. Problem5-Taxation
20. Personal and Household Finances
21. Commission

### 5.3 Simple Interest and Compound Interest

22. Simple Interest
23. Compound Interest

### 5.4 Hire Purchase

24. Hire Purchased

### 5.5 Money Exchange

25. Money Exchange
26. Problem1-Money Exchange
27. Problem2-Money Exchange
28. Problem3-Money Exchange
29. Problem4-Money Exchange

# Chapter # 06

## Coordinate Geometry (19 Videos)

### 6.1 Gradient of a Straight Lin

1. Inclination of Line
2. Problem1-Inclination of Line

- 3. Gradient of a Straight Line
- 4. Gradient of a Straight Line Joining Two Points
- 6.2 Length of a Line Segment**
  - 5. Problem1-Derivation of Distance formula
  - 6. Problem2-Derivation of Distance formula
- 6.3 Equation of Straight Line**
  - 7. Equations of a Straight Line
  - 8. More on Equations of Straight Line
  - 9. Problem-Equations of a Straight Line
  - 10. Derivation of Slope Intercept form
  - 11. Problem1-Derivation of Slope Intercept form
  - 12. Deriving Point-slope Form of Equation of Straight Line
  - 13. Problem1-Deriving Point-slope Form of Equation of Straight Line
- 6.4 Parallel and Perpendicular Lines**
  - 14. Perpendicular- Parallel lines
  - 15. Slope of Collinear Line Segments
  - 16. Slope of Parallel Lines
  - 17. Problem-Slope of Parallel Lines
  - 18. Problem2-Slope of Parallel Lines
  - 19. Problem 1: Perpendicular and parallel lines

## Chapter # 07

### Graph of Functions and Graphical Solution (16

Videos)

- 7.1 Graph of Cubic Functions**
  - 1. Graphs of Cubic Functions
  - 2. Graph of a General Cubic Functions
  - 3. More on Graph of a General Cubic Functions
- 7.2 Graph of Reciprocal Function**
  - 4. Graphs of Reciprocal Functions
  - 5. Graphs of Rational Functions
  - 6. Graph of the function  $y = a/x$
- 7.3 Graph of Exponential Functions**
  - 7. Graph of Exponentials functions
- 7.4 Gradient of a Curve**
  - 8. Problem 1: Circle and its elements
  - 9. Gradient of a Curve
- 7.5 Application of Graph in Real World Cont**

10. Travel Graphs
11. Gradient of a Distance-Time Curve
12. Speed-Time Graphs
13. Graphs in Practical Solutions
14. Graphical Solutions of Problems From Daily Life
15. Piece-Wise Linear Relations
16. Graph of Functions Defined Piece-wise

# Chapter # 08

## Further Trigonometry (32 Videos)

### 8.1 Sine and Cosine of Obtuse Angles

1. Concept of Oblique Triangles
2. Problem-Concept of Oblique Triangles
3. Problem2-Deductions From Fundamental Law
4. Problem1-Trigonometric Ratios and Allied Angles
5. Problem1-Triple Angle Identities
6. Problem2-Triple Angle Identities
7. Problem-Sum or Difference to Product of Sines and Cosines
8. Introduction to Solutions of Trigonometric Equations
9. Problem-Introduction to Solutions of Trigonometric Equations
10. Solution of the Type  $\sin A = k$ ,  $\cos A = k$  and  $\tan A = k$
11. Solution of General Trigonometric Equations
12. Problem1-Solution of General Trigonometric Equations
13. Problem2-Solution of General Trigonometric Equations
14. Problem3-Solution of General Trigonometric Equations
15. Solution of General Trigonometric Equations by Factorization
16. More on Solution of General Trigonometric Equations by Factorization
17. Problem-Solution of General Trigonometric Equations by Factorization
18. Solution of Trigonometric Equations by Trigonometric Identities
19. Problem-Solution of Trigonometric Equations by Trigonometric Identi
20. Solution of Trigonometric Equations by Quadratic Formula
21. Problem-Solution of Trigonometric Equations by Quadratic Formula
22. Trigonometric Equations Containing Principal Functions
23. Problem-Trigonometric Equations Containing Principal Functions

### 8.2 Area of Triangle

24. Area of Triangle by Measuring Two Sides and Their Included Angle
25. Area of Triangle by Hero's Formula

### 8.3 Sine Rule

26. The Sine Rule
27. Examples on Sine Rule

- 28. Application of the Sine Rule
- 8.4 Cosine Rule**
- 29. The Cosine Rule
- 30. More on The Cosine Rule
- 31. Problem1-The Cosine Rule
- 32. Problem2-The Cosine Rule

## Chapter # 09

### Application of Trigonometry (20 Videos)

#### 9.1 Angle of Elevation and Depression

1. Concept of Angle of Elevation & Depression
2. Problem-Concept of Angle of Elevation & Depression
3. Engineering and Heights and Distances
4. More on Engineering and Heights and Distances
5. Problem1-Engineering and Heights and Distances
6. Problem2-Engineering and Heights and Distances
7. Word problem when one Side and Angle of Elevation are Given
8. Problem-When one Side & Angle of Elevation are Given
9. Heights and Distances
10. Problem-Heights and Distances
11. Word problem when one Side and Angle of Depression are Given
12. Problem1-when One Side & Angle of Depression are Given
13. Problem2-when One Side & Angle of Depression are Given
14. Word problem when Hypotenuse and Angle of Elevation are Given
15. Problem-when Hypotenuse & Angle of Elevation are Given
16. Word Problem with given Sides-Angle of Elevation-Depression
17. Problem1-when Given Sides-Angle of Elevation-Depression
18. Problem2-when Given Sides-Angle of Elevation-Depression

#### 9.2 Bearing

19. Bearing
20. Compass and True Bearing

## Chapter # 10

### Arc Length, Area of a Sector and Radian (11 Videos)

## 10.1 Length of Arc

1. Problem1-Relationship of Radius-Central Angle-Arc Length

## 10.2 Area of Sector

2. Area of a Circular Sector.
3. Problem1-Area of a Circular Sector.
4. Problem2-Area of a Circular Sector.

## 10.3 Radian Measure

5. Problem1-Radian Measure of an Angle
6. Problem2-Radian Measure of an Angle
7. Relationship Between Radians & Degrees.
8. Area of Triangle by Measuring Two Sides and Their Included Angle

## 10.4 Arc Length and Area of Sector using Rad

9. Relationship of Radius-Central Angle-Arc Length
10. Problem1-Relationship of Radius-Central Angle-Arc Length
11. Problem2-Relationship of Radius-Central Angle-Arc Length

# Chapter # 11

## Congruence and Similarity Tests (13 Videos)

### 11.1 Congruence Test

1. Triangles Congruence
2. Problem-Triangles Congruency
3. Congruent Figures and Objects
4. Problem-Congruent Figures and Objects
5. Congruency Tests
6. Problem-Congruency Tests

### 11.2 Similarity Test

7. Similar Triangles
8. Similarity and Scale Drawings
9. Test for Similarity between two triangles
10. Condition of Similarity of 2 Polygons
11. Problem-Condition of Similarity of 2 Polygons

### 11.3 Application of Congruent and Similar Tr

12. Problem-Similar Triangles
13. Problem-Similarity and Enlargement



# Chapter # 12

## Area and Volume of Similar Figures and Solids (02

Videos)

### 12.1 Area of Similar Figures

1. Area of Similar Figures

### 12.2 Volume of Similar Solids

2. Volumes of Similar Solids

# Chapter # 13

## Geometrical Properties of Circles (26 Videos)

### 13.1 Symmetric Properties of Circles

1. The perpendicular bisector of chord of circle passes through centre o
2. Perpendicular radius bisects chord
3. Problem 1: Perpendicular radius bisects chord
4. Converse of perpendicular radius bisects chord
5. Theorem Congruent Chords are Equidistance from Circle
6. Problem1-Congruent Chords Equidistance from Circle
7. Theorem Chords Equidistance of Circle are Congruent
8. Problem2-Congruent Chords Equidistance from Circle
9. Problem-Chords Equidistance of Circle are Congruent
10. Introduction to Circle & its Characteristics
11. Problem-Introduction to Circle & its Characteristics
12. Concept of Secant & Tangent Line
13. Problem-Introducing Secant and Tangent Line
14. Theorem on Radial Segment and Tangent of a Circle
15. Theorem on Circle Relation of Tangent and Radial Segment
16. Problem-Tangent to Circle
17. Problem-Converse of Tangent to Circle
18. Theorem on Circle Equal Tangents
19. Theorem on Externally Touching Circles
20. Problem-Equal Tangent Segments from a Point to a Circle
21. Problem-Distance of Centers of Externally Tangent Circles
22. Theorem on Circle Angle of Minor Arc
23. Problem1-Central Angle Theorem
24. Problem2-Central Angle Theorem
25. Theorem on Angle in a Semi-Circle

## 26. Theorem related to Angles in a Same Segment

# O Levels (Math D 4)

(Total Videos # 298)

## Chapter # 01

### Linear inequalities in two variables (19 Videos)

#### 1.1 Linear inequalities in two variables

1. Density Property
2. Problem-Density Property
3. Archimedian Property of Inequality
4. Transitive property of Inequality
5. Problem1-Transitive property of Inequality
6. Problem2-Transitive property of Inequality
7. Additive property of inequality
8. Problem-Additive property of inequality
9. Multiplicative Property of Inequality
10. Problem1-Multiplicative Property of Inequality
11. Problem2-Multiplicative Property of Inequality
12. Inequality multiplicative Inverse
13. Problem-Inequality multiplicative Inverse
14. Linear Equations in one, two and three variables
15. Problem 1: Linear Equations in one, two and three variables
16. Graphing of Linear Inequality in Two Variables
17. Procedure for Graphing Linear Inequality in Two Variables
18. Problem1-Graphing of Linear Inequality in Two Variables
19. Problem2-Graphing of Linear Inequality in Two Variables

## Chapter # 02

### Further sets (04 Videos)

#### 2.1 Applications of Venn diagrams in proble

1. Intersection of Set
2. Problem-Intersection of Two Sets
3. Associative Property of Intersection of Sets
4. Problem-Intersection of Three Sets

# Chapter # 03

## Probability of combined events (12 Videos)

### **3.1 Probability of single events**

1. Experiments and Sample Space
2. Problem-Experiments and Sample Space
3. Definition of Probability
4. Problem-Definition of Probability

### **3.2 Simple combined events, possibility dia**

5. Simple Combined Events and Possibility Diagrams
6. Problem-Simple Combined Events and Possibility Diagrams
7. Simple Combined Events and Tree Diagrams

### **3.3 Addition law of probability and mutual**

8. Addition of Probabilities and Mutually Exclusive Events
9. Problem-Addition of Probabilities of Mutually Exclusive Events

### **3.4 Multiplication law of probability and i**

10. Multiplication of Probabilities and Independent Events
11. More on Multiplication of Probabilities and Independent Events
12. Problem-Multiplication of Probabilities of Independent Events

# Chapter # 04

## Statistical data analysis (12 Videos)

### **4.1 Cumulative frequency table and curve**

1. Construction of Cumulative Frequency Table
2. Problem on Construction of Cumulative Frequency Table
3. Drawing of Cumulative Frequency Polygon
4. Problem on Drawing of Cumulative Frequency Polygon
5. Cumulative Frequency Curve

### **4.2 Median, quartiles, percentiles, range a**

6. Median, Quartiles and Percentiles
7. Interquartile Range

### **4.3 Box-and-Whisker plots**

8. Box-and-Whisker Plots

#### 4.4 Standard deviation

9. Introduction to Variance & S.D
10. Problem on Introduction to Variance & S.D
11. Uses and Properties of Standard Deviation
12. Problem 1: Uses and Properties of Standard Deviation

## Chapter # 05

### Matrices (53 Videos)

#### 5.1 Introduction to matrices

1. Introducing Matrix
2. More on Introducing Matrix
3. Problem-Introducing Matrix
4. Equal Matrices
5. Problem1-Equal Matrices
6. Problem2-Equal Matrices

#### 5.2 Addition and subtraction of matrices

7. Addition of Matrices
8. Problem-Addition of Matrices
9. Subtraction of Matrices
10. Problem-Subtraction of Matrices

#### 5.3 Matrix multiplication

11. Multiplication of Matrix by Real Number
12. Problem-Multiplication of Matrix by Real Number
13. Multiplication of Matrices
14. More on Multiplication of Matrices
15. Problem1-Multiplication of Matrices
16. Problem3-Multiplication of Matrices

#### 5.4 Determinant of a matrix

17. Determinant of 2-by-2 Matrix
18. Minor of an Element of a Matrix and Its Determinant
19. Problem-Minor of an Element of a Matrix or Its Determinant
20. Cofactor of an Element of a Matrix
21. Problem-Cofactor of an Element of a Matrix
22. Determinant of a Square Matrix of Order 3 or greater
23. Problem-Determinant of a Square Matrix of Order 3 or greater
24. Properties of Determinants
25. More on Properties of Determinants
26. Problem 1-Properties of Determinants
27. Problem 2-Properties of Determinants

- 28. Problem 3-Properties of Determinants
- 29. Problem 4-Properties of Determinants
- 30. Properties of Determinants of Order Three
- 31. Problem-Properties of Determinants of Order Three
- 32. Alternate Method For Expanding a Third Order Determinant
- 33. Problem-Alternate Method For Expanding a Third Order Determinant
- 34. Singular and Non-Singular Matrix
- 35. Problem-Singular and Non-Singular Matrix

## 5.5 Inverse of a matrix

- 36. Multiplicative Inverse of Non-Singular Matrix
- 37. Problem-Multiplicative Inverse of Non-Singular Matrix
- 38. Matrix Inverse Using Adjoint
- 39. More on Matrix Inverse Using Adjoint
- 40. Problem1-Matrix Inverse Using Adjoint
- 41. Problem2-Matrix Inverse Using Adjoint
- 42. Problem3-Matrix Inverse Using Adjoint
- 43. Problem4-Matrix Inverse Using Adjoint
- 44. Adjoint of a Square Matrix of Order  $n = 3$  or  $n > 3$
- 45. Problem-Adjoint of a Square Matrix of Order  $n = 3$  or  $n > 3$
- 46. Deriving a Method For Determining Inverses
- 47. Problem-Deriving a Method For Determining Inverses
- 48. Inverse of Matrix by Row Operation
- 49. Problem-Inverse of Matrix by Row Operation
- 50. More on Problem- Inverse of Matrix by Row Operation
- 51. Inverse of Matrix by Column Operation
- 52. Problem-Inverse of Matrix by Column Operation
- 53. More on Problem-Inverse of Matrix by Column Operation

# Chapter # 07

## Vectors (33 Videos)

### 7.1 Vectors in two dimensions

- 1. Scalar and Vector Quantities
- 2. Problem-Scalar and Vector Quantities
- 3. Terminologies and Notations of Vectors
- 4. Equal Vectors
- 5. Vectors which are Opposite
- 6. Problem-Vectors which are Opposite
- 7. Column Vectors

### 7.2 Addition of vectors

- 8. Addition of Vectors

- 9. Problem-Addition of Vectors
- 10. Vector Addition is Associative
- 11. Problem-Vector Addition is Associative
- 12. Zero Vectors
- 7.3 Vector subtraction**
  - 13. Subtraction of Vectors
  - 14. Problem-Subtraction of Vectors
- 7.4 Scalar multiples of a vector**
  - 15. Scalar Multiple of a Vector
  - 16. Problem-Scalar Multiple of a Vector
- 7.5 Expression of a vector in terms of two**
  - 17. Expression of a Given Vector in Terms of two Vectors
  - 18. Problem-Expression of a Given Vector in Terms of two Vectors
- 7.6 Position vectors**
  - 19. Position Vectors
  - 20. Problem-Position Vectors
- 7.7 Applications of vectors**
  - 21. Problem-Properties of Magnitude of Vector
  - 22. Notation for Representing Vectors in Plane
  - 23. Problem-Notation for Representing Vectors in Plane
  - 24. Components of a Vector
  - 25. Properties of Vectors in Plane
  - 26. More on Properties of Vectors in Plane
  - 27. A Unit Vector in the Direction of Another Vector
  - 28. Problem-A Unit Vector in the Direction of Another Vector
  - 29. Notation for Vectors in Coordinate System
  - 30. Problem-Notation for Vectors in Coordinate System
  - 31. The Ratio Formula in Vector
  - 32. Problem1-The Ratio Formula in Vector
  - 33. Problem2-The Ratio Formula in Vector

## Chapter # 09

### Revision: Numbers and Algebra (78 Videos)

- 9.1 Numbers and percentages**
  - 1. Prime Factorisation
  - 2. Problem-Prime Factorization
  - 3. Product Law of Exponents of Rational Numbers
  - 4. Problem-Product Law of Exponents of Rational Numbers
  - 5. Quotient Law of Exponents of Rational Numbers

6. Problem-Quotient Law of Exponents of Rational Numbers
7. Power Law of Rational Numbers
8. Problem-Power Law of Rational Numbers
9. Zero and negative Indices
10. Problem-Negative Exponent of Rational Numbers
11. Demonstration of the concept of power of an integer
12. Applications of Laws of Exponents
13. Problem-Appling Laws of Exponents to Evaluate Expressions
14. Concept of Percentage
15. Problem-Concept of Percentage
16. Problem on Percentage by Using Unitary Method
17. Problem on Percentage by Using Proportion
18. Ordering fractions using percentage
19. Solve Real Life Problems Involving Percentages
20. Problem-Solve Real Life Problems Involving Percentages

## **9.2 Proportion, ratio, rate and speed**

21. Direct Proportion
22. Speed and Average Speed
23. Problems Involving Speed and Average Speed

## **9.3 Algebraic manipulation and formulae**

24. Simplification of Algebraic Expressions
25. Problem-Simplification of Algebraic Expressions
26. Evaluation of Algebraic Expressions
27. Problem-Evaluation of Algebraic Expressions
28. Changing the Subject of a Formula
29. Further Examples on Changing the Subject of a Formula
30. Finding an Unknown in a Formula
31. Number Sequences
32. General Term in a Number Sequence
33. Problem Solving

## **9.4 Equations and inequalities**

34. Solution of a Linear Equations
35. Problem-Solution of a Linear Equations
36. Finding Solution Using Method of Equating the Coefficients
37. Elimination by Substitution Method
38. Finding Solution Using Method of Cross Multiplication
39. Solving Simultaneous Linear Equations -p1
40. More on Solving Simultaneous Linear Equations -p1
41. Solving Simultaneous Linear Equations -p2
42. More on Solving Simultaneous Linear Equations -p2
43. Introducing Linear Inequality
44. Problem-Introducing Linear Inequality

## **9.5 Functions and graphs**

45. Introduction to Function
46. More on Introduction to Functions



- 47. Problem on Introduction to Function
- 48. Problem2-Introduction to Function
- 49. Problem3-Introduction to Function
- 50. Problem4-Introduction to Function
- 51. Types of Relations
- 52. Inverse of a Function
- 53. More on Inverse of a Function
- 54. Problem1-Inverse of a Function
- 55. Problem2-Inverse of a Function
- 56. Domain & Range of Inverse Function
- 57. Graphical Solution of the Equation

## **9.6 Graphs in practical situations**

- 58. Speed-Time Graphs
- 59. Graphs in Practical Solutions

## **9.7 Sets**

- 60. Set Definition
- 61. Problem-Set Definition
- 62. Set Notation & its Characteristics
- 63. Problem-Set Notation & its Characteristics
- 64. Presentation of a Set
- 65. Problem-Presentation of a Set
- 66. Set Builder Notation
- 67. Problem on Set Builder Notation
- 68. Introduction to Venn Diagrams
- 69. Problem on Introduction to Venn Diagrams

## **9.8 Matrices**

- 70. Addition of Matrices
- 71. Problem-Addition of Matrices
- 72. Subtraction of Matrices
- 73. Problem-Subtraction of Matrices
- 74. Multiplication of Matrix by Real Number
- 75. Problem-Multiplication of Matrix by Real Number
- 76. Multiplication of Matrices
- 77. More on Multiplication of Matrices
- 78. Problem1-Multiplication of Matrices

# **Chapter # 10**

## **Revision: Geometry and Measurement (76 Videos)**

### **10.1 Angles, Triangles and Polygons**

- 1. Alternate and corresponding Angles

2. Problem 1: Alternate and corresponding Angles
3. Concept of Alternate Interior Angles
4. Concept of Interior Angles
5. Problem- Finding Angles Formed by a Transversal

## **10.2 Congruence and similarity**

6. Similar Triangles
7. Problem-Similar Triangles

## **10.3 Pythagoras' theorem and trigonometry**

8. Area of a Triangle with Given Sides
9. More on Area of a Triangle with Given Sides
10. Trigonometric Ratios of an Acute Angle
11. Problem-Trigonometric Ratios of An Acute Angle
12. Trigonometric Ratios of 45 Degree
13. Problem-Trigonometric Ratios of An Angle of 45 Degree
14. Trigonometric Ratios of 30 & 60 Degree
15. Problem-Trigonometric Ratios of Angles of 30 & 60 Degree
16. Trigonometric Ratios of an Complementary Angles
17. Problem 1: Trigonometric Ratios of an Complementary Angles
18. Concept of Angle of Elevation & Depression
19. Problem-Concept of Angle of Elevation & Depression
20. Engineering and Heights and Distances
21. More on Engineering and Heights and Distances
22. Problem1-Engineering and Heights and Distances
23. Problem2-Engineering and Heights and Distances
24. Word problem when one Side and Angle of Elevation are Given
25. Problem-When one Side & Angle of Elevation are Given
26. Heights and Distances
27. Problem-Heights and Distances
28. Word problem when one Side and Angle of Depression are Given
29. Problem1-when One Side & Angle of Depression are Given
30. Problem2-when One Side & Angle of Depression are Given
31. Word problem when Hypotenuse and Angle of Elevation are Given
32. Problem-when Hypotenuse & Angle of Elevation are Given
33. Word Problem with given Sides-Angle of Elevation-Depression
34. Problem1-when Given Sides-Angle of Elevation-Depression
35. Problem2-when Given Sides-Angle of Elevation-Depression
36. Bearing
37. Compass and True Bearing

## **10.4 Mensuration**

38. Relationship of Radius-Central Angle-Arc Length
39. Problem1-Relationship of Radius-Central Angle-Arc Length
40. Problem2-Relationship of Radius-Central Angle-Arc Length
41. Area of a Circular Sector.
42. Problem1-Area of a Circular Sector.
43. Problem2-Area of a Circular Sector.

- 44. Problems Using Arcs and Sectors
- 45. More on Problems Using Arcs and Sectors

### **10.5 Geometrical transformation and symmetry**

- 46. Intercepts and Symmetry
- 47. Line of symmetry
- 48. Symmetric shapes on square grid
- 49. Symmetric shapes on dot pattern
- 50. Reflexive symmetry
- 51. Rotational symmetry
- 52. Identify all lines of symmetry of a shape
- 53. Point of rotation and order of rotational symmetry

### **10.6 Coordinate geometry**

- 54. Normal Form of Equation of Straight Line
- 55. Problem1-Normal Form of Equation of Straight Line
- 56. Collinear and Non-collinear Points
- 57. Problem 1: Collinear points and Non-collinear points
- 58. Perpendicular- Parallel lines
- 59. Problem 1: Perpendicular and parallel lines

### **10.7 Vectors**

- 60. Position Vectors
- 61. Problem-Position Vectors

### **10.8 Properties of circles**

- 62. Proof-2 Tangents can be Drawn to Circle from Point
- 63. More on Proof-2 Tangents can be Drawn to Circle from Point
- 64. Length of Tangent to Circle
- 65. To Prove Circles Diameter is 2 Times its Radius
- 66. Chords Perpendicular Passes Centre of Circle
- 67. More on Chords Perpendicular Passes Centre of Circle
- 68. Line From Centre and Midpoint of Chord is Perp to it
- 69. More on Line From Centre and Midpoint of Chord is Perp to it
- 70. Congruent Chords are Equidistance from Centre of Circle
- 71. More on Congruent Chords are Equidistance from Centre of Circle
- 72. Angle in Semi-Circle is Right Angle
- 73. More on Angle in Semi-Circle is Right Angle
- 74. Perpendicular Radial Segment is Tangent to Circle
- 75. More on Perpendicular Radial Segment is Tangent to Circle
- 76. Tangent to Circle is Perpendicular to Radial Segment

# **Chapter # 11**

## **Revision: Probability and statistics (11 Videos)**

## **11.1 Probability**

1. Simple Combined Events and Possibility Diagrams
2. Problem-Simple Combined Events and Possibility Diagrams
3. Multiplication of Probabilities and Independent Events
4. More on Multiplication of Probabilities and Independent Events
5. Problem-Multiplication of Probabilities of Independent Events
6. Multiplication of Probabilities of n Independent Events
7. Problem-Multiplication of Probabilities of n Independent Events
8. Simple Combined Events and Tree Diagrams

## **11.2 Statistics**

9. Dot Diagram
10. Box-and-Whisker Plots
11. Cumulative Frequency Curve

# **O Levels (Biology)**

**(Total Videos # 315)**

## **Chapter # 01**

# **Classification** (26 Videos)

## **1.1 Characteristics of Living Things**

1. Growth
2. Movement
3. Sensitivity
4. Excretion
5. Respiration
6. Reproduction

## **1.2 Classification**

7. Aims and Basis of Classification
8. Species - The Basic Unit of Classification
9. Binomial Nomenclature

## **1.3 The Kingdoms of Living Organisms**

10. Characteristics of Fungi
11. Characteristics of Fungi
12. General Characteristics of Protists
13. Structure of Bacteria (Capsule, Pili and Slime)

## **1.4 Viruses**

14. Viruses
15. Structure of Viruses

## **1.5 Classifying Animals**

16. Class Pisces (Fishes)
17. Class Amphibia
18. Class Reptilia
19. Class Aves
20. Class Mammalia
21. Phylum Arthropoda
22. More on Phylum Arthropoda
23. Classification of Arthropods

## **1.6 Classifying Plants**

24. General Characteristics of Plants
25. Classification of Plantae
26. Plant Body of Angiosperms

# **Chapter # 02**

## **Cells** (19 Videos)

## 2.1 Cell Structure

1. Cell
2. Light Microscope
3. Electron Microscope
4. Cell Membrane
5. Cell Wall
6. Cytoplasm, Cytoskeleton
7. More on Cytoplasm, Cell Organelles
8. Vacuoles
9. Chloroplasts, The Sites of Photosynthesis
10. Nucleus
11. More on Nucleus
12. Mitochondria
13. Mitochondria Convert Energy
14. Ribosomes
15. Stage Micrometre, Units Used in Micrometry

## 2.2 Cells and Organisms

16. Organelle, Cell and Tissue Level
17. Organ and Organ System Level
18. Individual, Population, Community and Biosphere Level
19. Levels of Organization

# Chapter # 03

## Movement In and Out of Cells (04 Videos)

### 3.1 Diffusion

1. Diffusion and Facilitated Diffusion

### 3.2 Osmosis

2. Osmosis
3. Water Balance Problems

### 3.3 Active Transport

4. Passive Transport and Active Transport

# Chapter # 04

## The Chemicals of Life (13 Videos)

#### 4.1 What are you made of?

1. Biological Importance of Water

#### 4.2 Carbohydrates

2. Carbohydrates
3. Monosaccharides
4. Polysaccharides
5. Functions of Carbohydrates

#### 4.3 Fats

6. Lipids Characteristics
7. Uses of Lipids

#### 4.4 Proteins

8. Structure of Amino Acid
9. Peptide Linkage
10. Structure of Protein
11. More on Structure of Protein
12. Functions of Protein

#### 4.5 DNA

13. Watson and Crick Model of DNA

## Chapter # 05

### Enzymes (05 Videos)

#### 5.1 Biological Catalysts

1. Enzymes
2. Nomenclature of Enzymes
3. Mechanism of Enzymes

#### 5.2 Properties of Enzymes

4. Characteristics of Enzymes
5. Factors Effecting the Rate of Enzyme Action

## Chapter # 06

### Plant Nutrition (11 Videos)

#### 6.1 Types of Nutrition

1. Autotrophic and Heterotrophic Nutrition
2. Minerals Requirement in Plants
- 6.2 Photosynthesis**
  3. Photosynthesis
  4. Role of Chlorophyll and Light
- 6.3 Leaves**
  5. Ultrastructure of Plant Cell
  6. Structure of Leaf
  7. Internal Structure of Leaf
- 6.4 Uses of Glucose**
  8. Uses of Carbohydrates
- 6.5 Testing Leaves for Starch**
  9. Starch
- 6.6 Limiting Factors**
  10. Limiting Factors in Photosynthesis
- 6.7 The Importance of Photosynthesis**
  11. Photosynthesis

# Chapter # 07

## Animal Nutrition (25 Videos)

- 7.1 Diet**
  1. Need for Food
  2. Nutrition in Man
  3. Water and Dietary Fiber
  4. Vitamins
  5. Minerals
  6. Lipids
  7. Obesity, Anorexia Nervosa
  8. Problems Related to Nutrition (Malnutrition)
  9. Protein - Energy Malnutrition
  10. Effects of Malnutrition
- 7.2 Digestion**
  11. Digestion in Human
  12. Types of Digestion
- 7.3 Teeth**
  13. Teeth
  14. Types of Teeth



## **7.4 The Alimentary Canal**

15. Human Alimentary Canal
16. Digestion in Oral Cavity
17. Digestion in Pharynx and Oesophagus
18. Digestion in Stomach
19. Digestion in Small Intestine
20. Absorption of Digested Food From Lumen of Intestine
21. Absorption of Protein in Small Intestine
22. Digestion in Large Intestine
23. Functions of Large Intestine
24. Diarrhoea and Vomiting

## **7.5 Assimilation**

25. Ingestion and Digestion of Food in Man

# **Chapter # 08**

## **Transport in Plants (14 Videos)**

### **8.1 Plant Transport System**

1. Transport in Plants
2. Xylem Tissues
3. Phloem Tissues
4. Vascular Plants - Successful Land Plants

### **8.2 Water Uptake**

5. Water in Plants
6. Transport of Water

### **8.3 Transpiration**

7. Transpiration
8. Water Potentials
9. Measurement of The Rate of Transpiration
10. Factors Affecting the Rate of Transpiration
11. Absorption by Roots

### **8.4 Transport of Manufactured Food**

12. Patterns of Transport
13. Pressure Flow Hypothesis
14. Source - Sink Movement

# Chapter # 09

## Transport in Animals (27 Videos)

### 9.1 Circulatory Systems

1. General Characteristics of Circulatory System
2. Double Circuit Circulation
3. Single Circuit Circulation

### 9.2 The Heart

4. Human Heart
5. Structure of Human Heart
6. More on Structure of Human Heart
7. More on Structure of Human Heart
8. Circulation of Blood Inside Heart
9. Coronary Circulation
10. Treatment of Cardiovascular Diseases
11. Angioplasty
12. Heartbeat
13. Valves of Heart
14. More on Valves of Heart

### 9.3 Blood

15. More on Blood Vessels, Arteries
16. Capillaries
17. Veins

### 9.4 Blood

18. Transportation in Man
19. Blood Cells
20. White Blood Cells and Platelets
21. Platelets
22. Functions of Blood
23. More on Functions of Blood

### 9.5 Lymph and Tissue Fluid

24. Tissue Fluid, Lymphatic System
25. Lymphatic System of Man
26. Lymph Nodes
27. Position of Lymph Nodes

# Chapter # 10

## **Pathogens and Immunity** (15 Videos)

### **10.1 Pathogen**

1. Viral Diseases
2. Some Diseases Common Diseases Caused by Viruses (Influenza, Common Co
3. Some Common Diseases Caused by Fungal Pathogens
4. Bacterial Diseases in Humans

### **10.2 Body Defences**

5. First Line of Defense
6. Chemical Components of the Skin's Defense
7. Cilia and Mucus
8. Landfill
9. Sewage Treatment

### **10.3 The Immune System**

10. Structure Model of Antibodies
11. Role of Memory Cell in Immunity
12. Immunization and Vaccination
13. Types of Immunity, Active Immunity
14. Passive Immunity
15. Autoimmune Disease

## **Chapter # 11**

## **Respiration and Gas Exchange** (16 Videos)

### **11.1 Respiration**

1. Respiration
2. Aerobic Respiration
3. Anaerobic Respiration
4. Comparison of Aerobic and Anaerobic Respiration

### **11.2 Gas Exchange in Human**

5. Need of Respiratory Gas Exchange
6. Properties of Respiratory Surfaces
7. Structure of Human Respiratory System
8. The Air Passageway
9. Upper Respiratory Tract (Nose)
10. Pharynx
11. Lower Respiratory Tract (Larynx and Trachea)
12. Bronchi and Bronchioles

### **11.3 Breathing Movements**

13. Mechanism of Breathing
14. Inspiration (Inhalation)
15. Expiration
16. Rate of Breathing

# Chapter # 12

## Excretion (11 Videos)

### 12.1 Excretory Products

1. Excretion in Animals

### 12.2 Nitrogenous Waste

2. Deamination, Urea, Uric Acid
3. Uric Acid
4. Urea

### 12.3 The Human Excretory System

5. Structure of Kidney
6. Structure of Nephron
7. Function of Kidney
8. Urea Formation, Kidney Filtration
9. Kidney (Renal) Failure
10. Peritoneal Dialysis
11. Kidney Transplant

# Chapter # 13

## Coordination and Response (16 Videos)

### 13.1 Coordination in Animals

1. Coordinated Action, Stimuli, Receptors
2. Steps Involved in Coordination

### 13.2 The Human Nervous System

3. Nerve Cell or Neuron
4. Components of Nervous System, Brain
5. Reflex Action
6. Synapse

### 13.3 Receptors

7. Eye
8. More on Eye
9. Process of Image Formation

### **13.4 The Endocrine System**

10. Important Endocrine Glands
11. Adrenal Glands
12. Comparison of Nervous Coordination and Chemical Coordination

### **13.5 Coordination and Response in Plants**

13. Tropic Movements
14. Plant Growth Regulators
15. Geotropism of Root and Phototropism of Shoots in Term of Auxins
16. Auxins and Gibberellins

## **Chapter # 14**

### **Homeostasis (10 Videos)**

#### **14.1 Maintaining the Internal Environmnet**

1. Homeostasis

#### **14.2 Control of Body Temperature**

2. Classification of Animals on the Basis of Heat Production
3. The Structure and Role of Skin
4. Working of Sensory Receptors With Special Reference to Skin
5. Chemical Components of the Skin's Defense
6. Concept of Feedback
7. Thermostat Function and Feedback Controls in Human and Fever
8. Feedback Mechanism

#### **14.3 Control of Blood Glucose Concentration**

9. Diabetes Mellitus and Its Genetic Basis
10. Diabetes Mellitus Type II and Its Genetic Basis

## **Chapter # 15**

### **Drugs (06 Videos)**

#### **15.1 What is a Drug?**

1. Drug, Pharmaceutical Drug, Addictive Drugs

## 15.2 Medicinal Drugs

2. Antibiotics, Bactericidal and Bacteriostatic antibiotics

## 15.3 Misuse of Drugs

3. Narcotics, Heroin, Cocaine
4. Nicotine, Alcohol

## 15.4 Tobacco Smoking

5. Bad Effects of Smoking
6. Lung Cancer

# Chapter # 16

## Reproduction in Plants (16 Videos)

### 16.1 Asexual Reproduction

1. Reproduction, Asexual and Sexual reproduction

### 16.2 Sexual Reproduction

2. Sexual Reproduction
3. Gametogenesis
4. Sexual Reproduction in Plants

### 16.3 Sexual Reproduction in Flowering Plant

5. Sexual Reproduction in Flowering Plants, The Flower
6. Reproductive Parts, Flower
7. Structure of Ovules
8. Structure of Pollen Grain
9. Pollination
10. Dispersal of Seed and Fruits by Wind & Water
11. Dispersal of Seed and Fruits by Animals
12. Formation of Seed and fruit
13. Development and Structure of Seed
14. Germination of Seed
15. Types of Germination

### 16.4 Comparing Sexual and Asexual Reproducti

16. Difference Between Asexual and Sexual Reproduction

# Chapter # 17

## Reproduction In Human (12 Videos)

## **17.1 Human Reproductive Organs**

1. Female Reproductive System
2. Male Reproductive System
3. Function of Female Reproductive System
4. Function of Male Reproductive System
5. The Placenta
6. Human Development in First Trimester (Placenta Development and Major
7. Second Trimester and Third Trimester
8. Labour Process, Clamping And Cutting of Umbilical Cord
9. Lactation/Nursing

## **17.2 Menstrual Cycle**

10. Menstrual Cycle
11. Hormonal Control of Reproductive Cycles

## **17.3 Sexually Transmitted Infections**

12. AIDS, A Sexually Transmitted Disease

# **Chapter # 18**

## **Inheritance (17 Videos)**

### **18.1 Chromosomes**

1. Chromosomes, Nucleolus

### **18.2 Cell Division**

2. Mitosis, Prophase
3. Anaphase, Telophase of Mitosis
4. More on Mitosis (Cytokinesis)
5. Meiosis
6. Meiosis I (Prophase I)
7. Phases of Meiosis

### **18.3 Inheritance**

8. What is a Gene?
9. Genes, Alleles, Locus, Phenotype, Genotype
10. Genotype and Its Types
11. Co-Dominance
12. Punnet Square, Test Cross
13. Maleness, Sex Determination of Maleness by 'SRY' Gene
14. Sex Linkage
15. Sex-Linkage in Human

### **18.4 DNA and Protein Synthesis**

16. Genetic Code

17. Translation

# Chapter # 19

## Variation and Natural Selection (11 Videos)

### 19.1 Variation

1. Variations And Natural Selection
2. Causes of Variations
3. More on Causes of Variation
4. Theory of Natural Selection

### 19.2 Adaptive Features

5. Xerophytes and Mesophytes
6. Hydrophytes and Halophytes

### 19.3 Selection

7. Variations lead to Evolution
8. More on Theory of Natural Selection
9. Theory of Natural Selection
10. Sickle Cell Anaemia, Diabetes Mellitus
11. Selective Breeding

# Chapter # 20

## Organisms and Their Environment (14 Videos)

### 20.1 Ecology

1. Ecology

### 20.2 Energy Flow

2. Food Chain
3. Food Web
4. Types of Consumers
5. Herbivores, Carnivores, Omnivores
6. Ecological Pyramids Number
7. Concept of Trophic Levels
8. Ecological Pyramids Biomass
9. Pyramids of Energy

### 20.3 Nutrient Cycle



10. Bacteria and Fungi in Soil as Soil Decomposers
11. Carbon Cycle
12. The Nitrogen Cycle
13. More on Nitrogen Cycle

#### **20.4 Population Size**

14. Need of Population Planning

## **Chapter # 21**

### **Biotechnology (10 Videos)**

#### **21.1 What is Biotechnology**

1. Scope and Importance of Biotechnology

#### **21.2 Using Yeast**

2. Yeast

#### **21.3 Making Use of Enzymes**

3. Uses of Enzymes

#### **21.4 Penicillin**

4. Antibiotics
5. Agaricus, Penicillium and Ustilago

#### **21.5 Genetic Engineering**

6. Genetic Engineering
7. Recombinant DNA Technology
8. Advance Recombinant DNA Technology, How to Get a Gene
9. Recombinant DNA Technology Depends on Enzymes
10. Molecular Carrier: Vector

## **Chapter # 22**

### **Humans And the Environment (17 Videos)**

#### **22.1 Food Production**

1. Genetic Engineering Versus Selective Breeding
2. Artificial Selection

#### **22.2 Habitat Destruction**

3. Deforestation, Soil Erosion

## 22.3 Pollution

4. Green House Effect
5. Global Warming
6. Effect of Global Warming
7. Acid Rain
8. Mechanism of Acid Rain
9. Effect of Acid Rain
10. Eutrophication or Algal Bloom, Industrial Effluents

## 22.4 Conservation

11. Protection and Conservation of Environment
12. Conservation of Biodiversity
13. Biological Principles of Sewage Treatment
14. Conservation of Wildlife
15. Endangered Species
16. Conservation of Biodiversity, Endangered Species in Pakistan
17. Issues and Importance of Conservation of Biodiversity

# O Levels (Physics)

(Total Videos # 379)

## Chapter # 01

### Measurement of Physical Quantities (18 Videos)

#### 1.1 Physical Quantities and SI Units

1. Physical Quantities
2. Problem on Physical Quantities
3. International Systems of Base Units

#### 1.2 Prefixes for SI Units

4. Introduction to Prefixes
5. Problem on Introduction to Prefixes

#### 1.3 The Measurement of Length

6. Standard of Length-Metre
7. Introduction to Vernier Calipers

8. Measuring with Vernier Calipers
9. problem on Measuring with Vernier Calipers
10. Introduction to Screw Gauge
11. Measuring with Screw Gauge
12. Problem on Measuring with Screw Gauge

#### **1.4 The Measurement of Time**

13. Standard of Time-Second
14. The Measurement of Time
15. Pendulum clock
16. Watch
17. Measuring Time by Stopwatch
18. Ticker-Tape Timer

## **Chapter # 02**

### **Speed, Velocity and Acceleration (14 Videos)**

#### **2.1 Distance and Displacement**

1. Difference between Distance and Displacement

#### **2.2 Speed and Velocity**

2. Introduction to speed
3. Introduction to velocity
4. Problem on Introduction to Speed

#### **2.3 The Displacement -Time Graph**

5. The Displacement-Time Graph
6. Instantaneous Speed and Velocity
7. Problem 1 on Distance - Time Graph

#### **2.4 Acceleration**

8. Introduction to Acceleration
9. Average Acceleration and Retardation
10. Problem on Introduction to Acceleration

#### **2.5 The Velocity-Time Graph**

11. Speed-time Graph
12. Problem on Speed-Time Graph

#### **2.6 Acceleration of Free Fall, g**

13. The Acceleration of Free Fall-g

#### **2.7 Terminal Velocity (Optional)**

14. Terminal Velocity (Optional)

# Chapter # 03

## Forces (16 Videos)

### 3.1 The Nature of Force

1. Introduction to Force
2. Types of Force

### 3.2 Scalars and Vectors

3. Scalars and Vectors
4. problem on Representation of Vectors
5. Vector Addition and Subtraction
6. Addition of Vectors by Law of Parallelogram
7. Problem 1 on Vector Addition and Subtraction
8. Problem 2 on Vector Addition and Subtraction

### 3.3 The Effects of Forces on Motion

9. Difference Between Mass and Weight
10. First Law of Newton
11. Second Law of Newton
12. Problem on Second Law of Newton

### 3.4 Newton's Third Law (Optional)

13. Third Law of Newton
14. Advantages and Disadvantages of Friction

### 3.5 Balanced and Unbalanced Forces

15. Balanced Forces
16. Unbalanced Forces

# Chapter # 04

## Mass, Weight and Density (07 Videos)

### 4.1 Inertia and the Measurement of Mass and

1. Difference Between Mass and Weight
2. Introduction to Inertia

### 4.2 Measurement of Density

3. Introduction to Density
4. Problem on Introduction to Density
5. Principle of Floatation
6. Problem 2 on Introduction to Density

7. Problem 3 on Introduction to Density

# Chapter # 05

## Turning Effect of Forces (07 Videos)

### 5.1 Moments

1. Introduction to Torque or Moment of a Force
2. problem on Introduction to Torque or Moment of a Force
3. Principle of Moment
4. Problem on Principle of Moments

### 5.2 The Center of Gravity and Stability

5. Center of Gravity
6. Center of Gravity of Irregular Shape
7. Stability and Position of Center of Mass

# Chapter # 06

## Work, Energy and Power (16 Videos)

### 6.1 Work

1. Introduction to Work
2. More on Introduction to Work
3. Problem on Introduction to Work

### 6.2 Energy

4. Introduction to Energy
5. Forms of Energy
6. Kinetic Energy
7. Problem on Kinetic Energy
8. Potential Energy
9. Law of Conservation of Energy
10. Problem on Potential Energy
11. Interconversion of Energy
12. Introduction to Efficiency
13. Problem on interconversion of K.E and P.E
14. Problem on Introduction to Efficiency

### 6.3 Power

15. Introduction to Power
16. Problem on Introduction to Power

## Chapter # 07

### Pressure (13 Videos)

#### 7.1 Pressure

1. Units of Pressure
2. Problem on Introduction to Pressure

#### 7.2 Atmospheric Pressure

3. Atmospheric Pressure

#### 7.3 Using Atmospheric Pressure

4. Demonstrating Atmospheric Pressure

#### 7.4 Pressure in Liquids

5. Water Pressure
6. Problem on Pressure in Liquids

#### 7.5 Transmission of Pressure in Liquids - H

7. Transmission of Pressure in Liquids
8. Hydraulic System
9. Problem on Hydraulic Press

#### 7.6 Measuring Atmospheric Pressure

10. Measuring Atmospheric Pressure
11. Aneroid Barometer (Optional)

#### 7.7 Atmospheric Pressure and Weather (Optional)

12. Variation in Atmospheric Pressure

#### 7.8 Measuring gas Pressure - The Manometer

13. Measuring Gas Pressure - The Manometer

## Chapter # 08

### Measurement of Temperature (11 Videos)

#### 8.1 Temperature and Heat

1. Temperature and Heat

#### 8.2 Measuring Temperature

2. Introduction to Thermometer

- 3. Thermometric Properties
- 8.3 Scales of Temperature**
  - 4. Scales of Temperature
  - 5. Conversion of Temperature Among Different Scale
  - 6. Problem 1 on Conversion of Temperature Among Different Scale
  - 7. Problem 2 on Conversion of Temperature Among Different Scale
- 8.4 Thermometric Liquids**
  - 8. Why Mercury is Used in Glass Thermometer.
  - 9. Why Alcohol is Used in Glass Thermometer.
- 8.5 Types of Thermometers**
  - 10. Clinical Thermometer
  - 11. Thermocouple Thermometers (Optional)

## Chapter # 09

### Simple Kinetic Theory of Matter (05 Videos)

- 9.1 Three States of Matter**
  - 1. Three States of Matter
- 9.2 The Kinetic Molecular Model of Matter**
  - 2. Kinetic Molecular Model of Matter
- 9.3 Evidence of Molecular Motion**
  - 3. Evidence of Molecular Motion
- 9.4 Pressure in Gases**
  - 4. Pressure in Gases
  - 5. Boyle's Law

## Chapter # 10

### Heat Capacity (05 Videos)

- 10.1 Heat**
  - 1. Temperature and Heat

## **10.2 Heat Capacity**

2. Heat Capacity

## **10.3 Specific Heat Capacity**

3. Specific Heat Capacity
4. Problem on Specific Heat Capacity
5. Problem 2 on Specific Heat Capacity

# **Chapter # 11**

## **Melting and Boiling (15 Videos)**

### **11.1 Melting and Solidification**

1. Melting and Solidification
2. Latent Heat of Fusion of Ice by an Experiment
3. Effect of Impurities on The Freezing Point of Water
4. Effect of Pressure on The Melting Point of Ice

### **11.2 Boiling and Condensation**

5. Boiling and Condensation
6. Latent Heat of Vaporization of Water by an Experiment
7. Effect of Impurities on The Boiling of Water
8. Effect of Pressure on The Boiling Point of Water

### **11.3 Latent Heat**

9. Introduction to Latent Heat of Fusion
10. Introduction to Latent Heat of Vaporization
11. Problem on Introduction to Latent Heat of Fusion
12. Problem on Introduction to Latent Heat of Vaporization

### **11.4 Evaporation**

13. Introduction to Evaporation
14. More on Introduction to Evaporation
15. Application of Cooling by Evaporation

# **Chapter # 12**

## **Transfer of Thermal Energy (14 Videos)**

### **12.1 The Three Processes of Heat Transfer**

1. Transfer of Heat



## **12.2 Conduction**

2. Conduction
3. Thermal Conductivity
4. Practical Application of Conduction of Heat

## **12.3 Convection**

5. Convection
6. Application of Convection

## **12.4 Radiation**

7. Introduction to Radiations

## **12.5 Consequences and Everyday Applications**

8. Consequences and Applications of Conduction
9. Practical Application of Conduction of Heat
10. Use of Conductors and Non-Conductors
11. Consequences and Applications of Convection
12. Application of Convection
13. Consequences and Applications of Radiation
14. Application and Consequences of Radiation

# **Chapter # 13**

## **General Wave Properties (25 Videos)**

### **13.1 Introducing waves**

1. Introductoin to Wave Motion
2. Problem 1-Working of Simple Harmonic Motion
3. Problem 1-Basic Terms in SHM
4. Problem 1-Derivation of Wave Equation
5. Problem 1-Mass Attached to Spring
6. Problem-Energies Interconversion in Spring-Mass System
7. Problem-Ball and Bowl as SHM
8. Problem-Introduction to Simple Pendulum
9. Problem-Working of Simple Pendulum
10. Problem 2-Characteristics of Wave

### **13.2 Transverse and Longitudinal Waves**

11. Introduction to Transverse and longitudinal waves
12. Problem 1-Introduction to Transverse and Longitudinal waves
13. Problem 1-Mechanical and Electromagnetic waves

### **13.3 Properties of waves Motion**

14. Characteristics of Wave
15. Problem 1-Stationary waves

- 16. Problem-Waves as Carriers of Energy
- 13.4 Waves Production and the Ripple Tank**
  - 17. Introducing Ripple Tank
  - 18. Problem 1-Introduction to Reflection
  - 19. Problem 1-Introduction to Refraction
- 13.5 Electromagnetic Spectrum**
  - 20. Electromagnetic Spectrum
  - 21. Generation, Detection and Particular Properties
  - 22. More on Generation, Detection and Particular Properties
  - 23. More on Generation, Detection and Particular Properties
  - 24. More on Generation, Detection and Particular Properties
  - 25. Problem 1- Electromagnetic Spectrum

## Chapter # 14

### Reflection and Refraction of Light (27 Videos)

- 14.1 The Nature and Propagation of Light**
  - 1. Introduction
- 14.2 Light Rays and Reflection**
  - 2. Luminous and Non-Luminous Bodies
  - 3. Regular and Irregular Reflection of Light
  - 4. Images Formed by Plane Mirror
  - 5. Some Important Applications of Plane Mirrors
  - 6. Problem 1-Images Formed by Plane Mirror
  - 7. Problem 1-Concave Mirrors
  - 8. Problem 2-Convex Mirrors
  - 9. Problem-Mirror Terminologies
  - 10. Problem 1-Images by Spherical Mirrors
  - 11. Problem 1-Spherical Mirror Formula
  - 12. Problem 1-Sign Convention & Linear Magnification
  - 13. Problem 1-Convex Mirror Formula
  - 14. Problem 1-Uses of Spherical Mirrors
  - 15. Problem 1-Reflection of light by spherical mirrors
- 14.3 Light Rays and Refraction**
  - 16. Refraction of Light
  - 17. Laws of Refraction
  - 18. Introducing Refractive Index
  - 19. Problem 1-Laws of Refraction
  - 20. Introducing Rainbow
  - 21. Problem 1-Speed of Light in Medium

22. Problem 1-Introducing Refractive Index

23. Problem 1-Apparent and Real Depth

#### **14.4 Total Internal Reflection**

24. Total Internal Reflection

25. Relationship b/w Refractive Index and Critical Angle

26. Problem 1-Total Internal Reflection

27. Problem 1-Relationship b/w Refractive Index and Critical Angle

## **Chapter # 15**

### **Converging Lens (11 Videos)**

#### **15.1 Thin Converging Lenses**

1. Types of Lenses

2. Ray Diagrams

3. Linear Magnification of Lenses

4. Problem 1-Image Formed by Convex Lens

5. Problem 1-Image Formed by Concave Lens

6. Problem 1-Power of a Lens

7. Problem 1-Image Location by Lens Formula

8. Problem 1-Linear Magnification of Lenses

#### **15.2 Applications of Converging Lenses**

9. Image Formation in Camera

10. Slide Projector

11. Photograph Enlarger

## **Chapter # 16**

### **Sound (26 Videos)**

#### **16.1 The Nature and Production of Sound**

1. How Sound is Produced and Travel

2. More on How Sound is Produced and Travel

3. Problem 1-More on How Sound is Produced and Travel

#### **16.2 The Transmission of Sound**

4. The Mechanical Nature of Sound

5. Problem 1-The Mechanical Nature of Sound

6. The Medium of Transmission

### **16.3 The Detection of Sound**

7. The Human Ear (Optional)
8. Audibility
9. Problem 1-Audibility
10. Problem 1-Audible Frequency Range
11. Problem 2-Audible Frequency Range

### **16.4 The Reflection of Sound**

12. Reflection of Sound (Echoes)
13. Uses of Echoes
14. Problem1-Reflection of Sound (Echoes)
15. Problem2-Reflection of Sound (Echoes)

### **16.5 Ultrasounds**

16. Ultrasounds and its Applications
17. Problem 1-Ultrasound and Its Applications

### **16.6 Measuring the Speed of Sound**

18. Measuring Speed of Sound
19. More on Measuring Speed of Sound
20. Problem 1-Measuring The Speed of Sound
21. Problem 2-Measuring The Speed of Sound

### **16.7 Pitch, Loudness and Quality**

22. Pitch of Sound
23. Problem 1- Pitch of Sound
24. Loudness of Sound
25. Quality of Sound
26. Problem 1- Sound Intensity and Sound Level

## **Chapter # 17**

### **Static Electricity (20 Videos)**

#### **17.1 The Nature and Production of Sound**

1. Introduction to Electrostatics
2. Some Electrostatic Experiments
3. An Explanation of Charging by Friction
4. Measurement of Electric Charge
5. Problem-Measurement of Electric Charge
6. Problem 1-Coulombs Law
7. Problem 2-Coulombs Law
8. Problem 1-Electrostatic Potential
9. Problem 2-Electrostatic Potential
10. Problem 3-Electrostatic Potential

#### **17.2 Insulators and Conductors**

- 11. Conductors and Insulators
- 17.3 The Electroscope (Optional)**
  - 12. Introduction to Electroscope
- 17.4 Electric Field**
  - 13. Electric Field and Electric Field Intensity
  - 14. Problem-Electric Field and Electric Field Intensity
  - 15. Introduction to Electric Field Lines
  - 16. Problem 1-Capacitor and Capacitance
  - 17. Problem 1-Capacitors in Parallel Combination
  - 18. Problem 1-Capacitors in Series Combination
- 17.5 Some Practical Applications and Hazards**
  - 19. Application of Electrostatics
  - 20. Hazards of Static Electricity

# Chapter # 18

## Current Electricity (35 Videos)

- 18.1 Static Charge and Electric Current**
  - 1. Introduction to Electricity and Magnetism
  - 2. More on Introduction to Electric Current
  - 3. Conventional Current
  - 4. Measurement of Current
  - 5. Problem-Introduction to Electric Current
  - 6. Problem 1-Measurement of Current
  - 7. Problem 2-Measurement of Current
- 18.2 Electric Symbols**
  - 8. Electric Symbols
  - 9. Representing Some Circuit Diagrams Using Electric Symbols
- 18.3 Electromotive Force (E.M.F) and Potenti**
  - 10. Electromotive Force
  - 11. The Measurement of e.m.f
  - 12. Problem- Measurement of e.m.f
  - 13. Potential Difference
  - 14. Measurement of Potential Difference
  - 15. A Gravitational Analogue of a Simple Electric Circuit
  - 16. Problem-Potential Difference
  - 17. Problem 1-Measurement of Potential Difference
- 18.4 Resistance**
  - 18. Resistance
  - 19. Resistors and Their Types
  - 20. Determining the Resistance of a Load

21. Problem-Determining the Resistance of a Load
22. Ohms Law
23. Characteristics of Ohmic and Non Ohmic Conductors
24. Specific Resistance
25. Problem-Characteristics of Ohmic and Non Ohmic Conductors
26. Problem 1-Specific Resistance
27. Problem 2-Specific Resistance
28. Problem 1-Effect of Temperature Upon Resistance
29. Problem 2-Effect of Temperature Upon Resistance

### **18.5 Electric Circuits - Series**

30. Series combination of Resistors
31. Problem 1-Parallel combination to Resistors
32. Problem 2-Parallel combination to Resistors
33. Problem 3-Parallel combination to Resistors
34. Problem 4-Parallel combination to Resistors

### **18.6 Electric Circuits - Parallel**

35. Parallel Combination to Resistors

## **Chapter # 19**

### **D.C. Circuits (04 Videos)**

#### **19.1 Series Circuits**

1. Current in a Series Circuit
2. Problem-Current in Series Circuit
3. Series combination of Resistors

#### **19.2 Parallel Circuits**

4. Parallel Combination to Resistors

## **Chapter # 20**

### **Practical Electric Circuits (18 Videos)**

#### **20.1 Some Uses of Electricity**

1. Electric Heating
2. Electric Lighting
3. Simple Electric Motor

#### **20.2 Measurement of Electric Energy**

4. Electric Power

5. Problem 1-Electric Power
6. Electrical Energy and Joules law
7. Problem 2-Electric Power
8. Kilowatt Hour
9. Problem 1-Electrical Energy and Joules law
10. Problem 2-Electrical Energy and Joules law

### **20.3 Dangers of Electricity**

11. Insulation Damage and Damp Conditions

### **20.4 Safe Use of Electricity at Home**

12. House Wiring
13. Introduction to Fuse
14. Switches
15. Plugs and sockets
16. Introduction to Earth Wire
17. Introduction to Circuit Breaker
18. Double Insulation

## **Chapter # 21**

### **Simple Phenomena of Magnetism (16 Videos)**

#### **21.1 Materials and Magnets**

1. The Discovery of Magnetism
2. Properties of Magnets
3. Testing a Magnet

#### **21.2 Magnetic Induction**

4. Induced Magnetism

#### **21.3 Theory of Magnetism**

5. Theory of Magnetism

#### **21.4 Methods of Magnetisation and Demagnetisation**

6. Single Touch Method
7. Electrical Method
8. Demagnetization

#### **21.5 Magnetic Fields and the Plotting Compass**

9. Demagnetization
10. The Earth's magnetic field

#### **21.6 Magnetic Properties of Iron and Steel**

11. Magnetic Properties of Iron and Steel

#### **21.7 Some Uses of Permanent Magnets and Electromagnets**

12. Permanent magnets
13. Electromagnets

## **21.8 Magnetic Effect of a Current**

14. Magnetic Effects of Steady Current
15. Magnetic Field of a Solenoid
16. Applications of Electromagnet

# **Chapter # 22**

## **Force on Conductor in a Magnetic Field (06 Videos)**

### **22.1 Force on a Current-Carrying Conductor in**

1. Force on a Current Carrying Conductor Place in a Magnetic Field
2. Problem1-Force on a Current Carrying Conductor Place in a Magnetic Fi
3. Problem2-Force on a Current Carrying Conductor Place in a Magnetic Fi

### **22.2 Force Between Two Parallel Current-Carr**

4. Force Between Two Parallel Current-Carrying Wires (Optional)

### **22.3 Force on a Current-Carrying Rectangular**

5. Turning Effects on a Current Carrying Coil in a Magnetic Field

### **22.4 Force on a Moving Charge in a Magnetic**

6. Force on a Moving Charge in a Magnetic Field

# **Chapter # 23**

## **Electromagnetic Effects (10 Videos)**

### **23.1 Electromagnetic Induction**

1. Generating Electricity
2. Introduction to Electromagnetism
3. Lenzs Law
4. Lenz's Law and Conservation of Energy

### **23.2 Iternative Current Generators**

5. AC Generator

### **23.3 Transformers**

6. Transformer
7. More on Transformer
8. High Voltage Transmission



9. Problem1-Transformer
10. Problem2-Transformer

# Chapter # 24

## Introductory Electronics (14 Videos)

### **24.1 Electrons and How They are Produced**

1. Electrons and How They are Produced
2. Thermionic Emission

### **24.2 Investigating the Properties of Electr**

3. Properties of Electrons

### **24.3 Cathode-Ray Tube - The Cathode-Ray Osci**

4. Cathode Ray Oscilloscope

### **24.4 Using the C.R.O**

5. Using the C.R.O,
6. Problem- Using the C.R.O

### **24.5 Circuit Components**

7. Circuit Components
8. Resistor
9. Potential Divider
10. Problem- Resistor
11. Thermistor
12. Light Dependent Resistor (l.d.r)
13. Problem- Potential Divider

### **24.6 Digital Logic Circuits**

14. Basic Operations of Digital Electronics

# Chapter # 25

## Radioactivity and the Nuclear Atom (26 Videos)

### **25.1 The Discovery of Radioactivity**

1. Natural Radioactivity

### **25.2 Detection of Radioactivity**

2. Introduction to Electroscope
3. Applications of Elelctroscope
4. The Diffusion Cloud Chamber
5. The Geiger - Muller (G-M) Tube

### **25.3 Characteristics of the Three Kinds of R**

6. Nature and Properties of Radiations

7. Properties of Electrons

### **25.4 Half-Life and its Measurements**

8. Half Life and its Measurements

9. Problem 1-Half Life and its Measurements

10. Radioactive Decay

11. Problem 2-Half Life and its Measurements

12. Problem 3-Half Life and its Measurements

### **25.5 Radiation and People - Uses, Hazards an**

13. Uses of Isotopes

14. Radiation Hazards

### **25.6 The Discovery of the Nuclear Atom**

15. The Geiger Marsden Experiment

16. Rutherford's Model of the Atom

### **25.7 Structure of the Atom**

17. Introduction to Atom

18. Problem-Atom and Atomic Nucleus

### **25.8 Nuclear Reactions**

19. Nuclear Reactors

### **25.9 Nuclear Energy**

20. Mass Energy Equation

21. Nuclear Fission

22. Problem-Einsteins Mass Energy Equation

23. More on Nuclear Fission

24. Fusion Reaction

25. Problem-Fission Reaction

26. Problem-Comparison between Fission and Fusion Reaction

# O Levels (Chemistry)

(Total Videos # 551)

## Chapter # 01

### Experimental Chemistry (39 Videos)

#### 1.1 Experimental Design

1. Measurement of Time
2. Measurement of Temperature
3. Measurement of Mass
4. Measurement of Volume
5. Properties of Gases
6. Collection of Gases
7. Collecting a Dry Sample of a Gas
8. Measuring Speed of Chemical Reactions (Gas)

#### 1.2 Methods of Purification and Analysis

9. Properties of Gases
10. Substance
11. Collection of Gases
12. Mixture
13. Collecting a Dry Sample of a Gas
14. Effect of Impurities on Melting Point of Solids
15. Measuring Speed of Chemical Reactions (Gas)
16. Effect of Impurities on Boiling Point of Liquids
17. Dissolving, Filtering and Evaporating
18. Purification of Solids by Crystallization
19. Decanting
20. Centrifuging
21. Separating Solids Using Filtration
22. Separating Solids Using Sublimation
23. Separating Solids Using a Magnet
24. Simple Distillation
25. Separating Immiscible Liquids Using Separating Funnel
26. Separating miscible Liquids Using Fractional Distillation
27. Paper Chromatography
28. More on Paper Chromatography
29. Analysis of a Sample Using Paper Chromatography
30. Chromatography for Colourless Substances

31. Uses of Chromatography
- 1.3 Identification of Ions and Gases**
32. Testing for Cations  
33. More on Testing for Cations  
34. Testing for Anions  
35. Flow Chart for Metal Ions Identification  
36. Test for Gases  
37. More on Test for Gases  
38. Flow Chart for Identification of Gases  
39. Test for the Presence of Water

## Chapter # 02

### The Particulate Nature of Matter (88 Videos)

#### **2.1 Kinetic Particle Theory**

1. Substance
2. Matter
3. Mixture
4. Shape and Volume of Solids
5. Effect of Impurities on Melting Point of Solids
6. Compressibility and Ease of Flow of Solids
7. Effect of Impurities on Boiling Point of Liquids
8. Density in Solids
9. Shape and Volume of Liquids
10. Compressibility and Ease of Flow of Liquids
11. Evaporation in Liquids and its Uses
12. Shape and Volume of Gases
13. Compressibility, Mobility and Density of Gases
14. Kinetic Particle Theory
15. Intrconversion of Three States of Matter
16. Melting
17. Boiling Points of Liquids
18. Evaporation
19. Condensation
20. Sublimation of solids
21. Brownian Movement
22. Crystal Growing
23. Diffusion and Effusion in Gases
24. Effect of Molecular Mass on the Rate of Diffusion
25. Diffusion in Liquids
26. Effect of Temperature on the Rate of Diffusion
27. Diffusion in Solids
28. Boyle's Law of Gases

29. Charles's Law

## 2.2 **Atomic Structure**

- 30. Dissolving, Filtering and Evaporating
- 31. Element
- 32. Percentage Volume/Volume
- 33. Occurrence of element
- 34. Decanting
- 35. Symbols of Element
- 36. Centrifuging
- 37. Atoms
- 38. Atom and its Structure
- 39. Proton, Neutron and Electron
- 40. Rutherford's Atomic Model
- 41. Electronic configuration
- 42. More on Electronic configuration
- 43. Atomic Number and Mass Number
- 44. Relative Atomic Mass and Atomic Mass Unit
- 45. Concept of Radioactivity
- 46. Nature of Radioactivity
- 47. Modern Periodic Table

## 2.3 **Structure and Properties of Materials**

- 48. Separating Solids Using Filtration
- 49. Substance
- 50. Separating Solids Using Sublimation
- 51. Molecule
- 52. Separating Solids Using a Magnet
- 53. Compound
- 54. Types of compound
- 55. Naming Compounds
- 56. Decomposition of Compounds
- 57. Mixture
- 58. Comparison of Mixture and Compound
- 59. Introduction to Alloys

## 2.4 **Ionic Bonding**

- 60. Simple Distillation
- 61. Why do Atoms Form Chemical Bonds?
- 62. Ions, cation-anion
- 63. Common Ions and Their Charges
- 64. Ionic Bond
- 65. Chemical Formulae of Ionic Compounds
- 66. Properties of Ionic Compound

## 2.5 **Covalent Bonding**

- 67. Separating Immiscible Liquids Using Separating Funnel
- 68. Covalent Bond
- 69. Separating miscible Liquids Using Fractional Distillation

70. Types of Covalent Bonds
71. Single Covalent Bond
72. Double Covalent Bond
73. Triple Covalent Bond
74. Properties of Covalent Compound
75. Molecular compounds
76. Macromolecular Compounds
77. Diamond
78. Graphite
79. Structure of Diamond
80. Structure of Graphite
81. Uses of Diamond and Graphite

## 2.6 **Metallic Bonding**

82. Paper Chromatography
83. Metallic Bond
84. More on Paper Chromatography
85. Properties of Metals
86. Analysis of a Sample Using Paper Chromatography
87. Chromatography for Colourless Substances
88. Uses of Chromatography

# Chapter # 03

## **Formulae, Stoichiometry and the Mole Concept** (67

Videos)

### 3.1 **Chemical Symbols and Formulae**

1. Matter
2. Symbols of Element
3. Shape and Volume of Solids
4. Chemical Formula
5. Compressibility and Ease of Flow of Solids
6. Molecular formula
7. Diffusion in Liquids
8. Concept of Valency
9. Shape and Volume of Liquids
10. Compressibility and Ease of Flow of Liquids
11. Evaporation in Liquids and its Uses
12. Shape and Volume of Gases
13. Compressibility, Mobility and Density of Gases

### **3.2 Relative Masses**

- 14. Kinetic Particle Theory
- 15. Relative Atomic Mass and Atomic Mass Unit
- 16. Intrconversion of Three States of Matter
- 17. Molecular mass
- 18. Melting
- 19. Relative Molecular Mass (Mr)
- 20. Boiling Points of Liquids
- 21. Formula mass
- 22. Evaporation
- 23. Condensation
- 24. Sublimation of solids

### **3.3 Percentage Composition**

- 25. Crystal Growing
- 26. The Percentage Composition of Elements in a Molecule
- 27. Diffusion and Effusion in Gases
- 28. The Percentage Composition of Sodium Carbonate crystal
- 29. Effect of Molecular Mass on the Rate of Diffusion
- 30. Diffusion in Liquids
- 31. Effect of Temperature on the Rate of Diffusion
- 32. Diffusion in Solids

### **3.4 Calculation of Mass**

- 33. Calculate the Mass of an Element in a Compound
- 34. Calculate the Mass of Water in a Compound

### **3.5 Empirical Formula**

- 35. Empirical formula
- 36. Empirical formula-covalent and ionic compound
- 37. The Empirical Formula from the Percentage Composition
- 38. Molecular formula

### **3.6 Chemical Equations**

- 39. Chemical Equation and Their Balancing
- 40. More on Chemical Equation and Their Balancing
- 41. More on Chemical Equations
- 42. Ionic Equations

### **3.7 The Mole Concept**

- 43. Avogadro's Number
- 44. Mole
- 45. Relative Atomic Mass in Grams
- 46. Relative Molecular Mass in Grams
- 47. Relative Formula Mass in Grams
- 48. Molar Gas Volume
- 49. Calculations of Molar Gas Volume
- 50. Mole-Mass Calculations
- 51. Mole-Particle Calculations

### 3.8 Stoichiometry

52. Stoichiometry
53. Calculating the Amount of Reactant
54. Calculating the Amount of Product
55. Molar Calculations from Equations
56. More on Molar Calculations from Equations
57. Limiting Reactants
58. Importance of Limiting Reactants
59. More on Importance of Limiting Reactants
60. Stoichiometric Calculations
61. Percentage Yield
62. Percentage Purity
63. Moles and Solution
64. Calculations Related to Concentration of Solutions
65. Molarity and Preparation of Molar Solution
66. Process of Titration
67. Acid-Base Titration

## Chapter # 04

### Electrolysis (34 Videos)

#### 4.1 Introducing Electrolysis

1. Element
2. Introduction to Electrolysis
3. Atom and its Structure
4. Explaining Electrolysis
5. Occurrence of element
6. Electrical Devices and Circuit Symbols
7. Conductors and Non-Conductors of Electricity
8. Concepts of Electrolytes
9. More on Electrolytes and Non-Electrolytes
10. Electrolysis of Sodium Chloride
11. Electrolysis of Molten Lead (II) Bromide

#### 4.2 Reactivity Series and Selective Dischar

12. Fundamentals of Matter
13. Reactivity series and Selective Discharge of Ions
14. Compound
15. More on Reactivity series and Selective Discharge of Ions
16. Naming Compounds
17. Effect of Concentration on Electrolysis
18. Decomposition of Compounds
19. Effect of Different Types of Electrode on Electrolysis



20. Manufacture of NaOH from Brine
21. Electrolysis of Aqueous Sulphuric Acid
22. Electrolysis of Aqueous Copper(II) Sulphate
23. Industrial Preparation of Sodium Hydroxide
24. Electrolysis of Water

#### **4.3 Industrial Applications of Electrolysis**

25. Mixture
26. Industrial Applications of Electrolysis
27. Comparison of Mixture and Compound
28. Electrolytic purification
29. Introduction to Alloys
30. Purification of Bauxite
31. Electrolysis of Pure Alumina

#### **4.4 Electroplating**

32. Electroplating of Copper

#### **4.5 Chemical to Electrical Energy**

33. Cells and Batteries
34. Dry Cell

## **Chapter # 05**

### **Energy from Chemicals (29 Videos)**

#### **5.1 Exothermic and Endothermic Changes**

1. Proton, Neutron and Electron
2. Heat Contents of Reaction
3. Heat Changes in a Reaction
4. Exothermic and Endothermic Changes
5. Enthalpy Change of Different Reactions
6. Making and Breaking Bonds
7. More on Making and Breaking Bonds
8. Exothermic Reactions
9. Energy profile Diagram for Exothermic Reactions
10. Importance of Exothermic Reactions
11. Endothermic Reactions
12. Energy profile Diagram for Endothermic Reactions

#### **5.2 The Process of Photosynthesis and Solar**

13. Atom and its Structure
14. Preparation of Food By Plants (Photosynthesis)
15. Environmental Chemistry and Polymeric Chemistry
16. Importance of Photosynthesis
17. Energy From Sun

### 5.3 Petroleum and Fuels

18. Concept of Radioactivity
19. What are Fuels?
20. Nature of Radioactivity
21. Fuel Cells
22. Saving Energy
23. Coal
24. Natural Gas
25. Petroleum
26. Fractional Distillation of Petroleum
27. Uses of Petroleum Fractions
28. Competing Uses of Petroleum
29. Alternating Fuels

## Chapter # 06

### Chemical Reactions (34 Videos)

#### 6.1 Rate of Reaction

1. Why do Atoms Form Chemical Bonds?
2. Rate of Chemical Change
3. Measuring the Speed of Reaction from Volume Change
4. Measuring the Speed of Reaction from Mass Change
5. Measuring the Speed of Reaction with the Help of a Graph
6. Factors Affecting the Speed of a Reaction
7. Effect of Concentration on Speed of Reaction
8. Effect of Pressure on Speed of Reaction
9. Effect of Particle Size on Speed of Reaction
10. Effect of Temperature on Speed of Reaction
11. Catalysts
12. Enzymes
13. Activation Energy
14. More on Activation Energy

#### 6.2 Redox

15. Ions, cation-anion
16. Oxidation and Reduction Reactions
17. Common Ions and Their Charges
18. Oxidation and Reduction in Terms of Loss and Gain of Oxygen
19. Ionic Bond
20. Oxidation and Reduction in Terms of Loss and Gain of Hydrogen
21. Chemical Formulae of Ionic Compounds
22. Oxidation and Reduction in Terms of Loss and Gain of Electron
23. Oxidation State and Rules for Assigning Oxidation State

24. Oxidizing and Reducing Agents
25. Reduction and Oxidation at the Same Time

### 6.3 Reversible Reactions

26. Covalent Bond
27. Irreversible Chemical Reactions
28. Types of Covalent Bonds
29. Reversible Chemical Reactions
30. Single Covalent Bond
31. Dynamic Chemical Equilibrium
32. Double Covalent Bond
33. Conditions and Recognition of Chemical Equilibrium
34. Triple Covalent Bond

# Chapter # 07

## The Chemistry and Uses of Acids, Bases and Salts (71 Videos)

### 7.1 The Characteristic Properties of Acids

1. Symbols of Element
2. Introduction to Acids and Bases
3. Physical Properties of Acids
4. Chemical Properties of Acids
5. Reaction of Acids with Carbonates and Bicarbonates
6. Reaction of Acids with Metal Oxides and Hydroxides
7. Role of Water For Acidity
8. Uses of Acids
9. Physical Properties of Bases
10. Bases
11. Alkalis
12. Properties of Alkalis
13. Reaction of Bases with Acids
14. Neutralization Reaction
15. More on Neutralisation
16. Chemical Properties of Bases
17. Precipitation of Hydroxide
18. Uses of Alkalis
19. Uses of Bases
20. Concentration and Strength
21. Dissociation of Acids
22. Strong Acids
23. Weak Acids
24. Dissociation of Bases

25. Indicators
26. Universal Indicator
27. Measuring of pH by Universal Indicator
28. Measuring of pH by pH Meter
29. Importance of pH
30. Acidic Oxides
31. Basic Oxides
32. Amphoteric Oxides
33. Neutral Oxides

## **7.2 Preparation of Salts**

34. Salts
35. Water of Crystallization
36. Properties of Salt
37. Preparation of Soluble salt
38. More on Soluble Salt
39. Preparation of Insoluble salt
40. Preparation of Zinc Sulphate Crystals
41. Chemical Properties of Acids
42. Reaction of Bases with Acids
43. Reaction of Acids with Carbonates and Bicarbonates
44. Process of Titration
45. Standard Solution
46. Acid-Base Titration
47. Ionic Precipitation
48. Precipitation of Hydroxide

## **7.3 Properties and Uses of Ammonia**

49. The Importance of Nitrogen and its Compounds
50. The Nitrogen Cycle
51. The Haber's Process
52. More on Haber process
53. Reversible Reaction in Ammonia
54. Dynamic Equilibrium in Ammonia
55. Reaction of Ammonia with Acids
56. Displacement of Ammonia from its Salt
57. Eutrophication
58. Manufacture of Fertilisers
59. More on Manufacture of Fertilisers
60. Preparation of Nitric Acid in Laboratory
61. Ammonia as Solvent

## **7.4 Sulfuric Acid**

62. Sulphur Dioxide
63. Properties of Sulphur Dioxide
64. Sulphur Trioxide
65. Properties of Sulphur Trioxide
66. Preparation of Sulphuric Acid through Contact Process

67. Manufacture of Detergents
68. Manufacture of fertilisers
69. Sulphuric Acid as Drying Agent
70. As battery Acid in Cars

# Chapter # 08

## The Periodic Table (25 Videos)

### 8.1 Periodic Trends

1. Modern Periodic Table
2. Chemical Families
3. Groups in Modern Periodic Table
4. Periods in Modern Periodic Table
5. Concept of Valency
6. Metals and Non-Metals
7. More on Metals and Non-Metals
8. Group Trends in Alkali Metals
9. Group Trends in Halogens
10. Transition Metals

### 8.2 Group Properties

11. Relative Atomic Mass in Grams
12. The Alkali Metals
13. Trend of Melting, Boiling Points & Density in Group I
14. Chemical Reaction of Water with Metals
15. Reactions of the Alkali Metals
16. The Halogens
17. Substitution Reactions of Chlorine
18. Oxidising Property of Halogens
19. Noble Gases
20. Properties of Noble Gases
21. Uses of Noble Gases

### 8.3 Transition Elements

22. Relative Molecular Mass in Grams
23. Introduction to the Transition Elements
24. Relative Formula Mass in Grams
25. Uses of Transition Metals

# Chapter # 09

# Metals (41 Videos)

## 9.1 Properties of Metals

1. Physical differences between Metals and Non-Metals
2. Chemical differences between Metals and Non-Metals
3. Properties of Metals
4. Introduction to Alloys
5. Brass
6. Bronze

## 9.2 Reactivity Series

7. The Reactivity Series of Metals
8. Reaction of Metals with Cold Water
9. Reaction of Metals with Steam
10. Reaction of Metals with Acids
11. Reduction of Metal Oxides With Carbon
12. Reduction of Metal Oxides With Hydrogen
13. Hydroxides of metals
14. Nitrates of Metals
15. Action of Heat on Metal Carbonates
16. Reaction Between a Metal and Oxide of another Metal
17. Displacement Reactions of Metals
18. More on Displacement Reactions of Metals

## 9.3 Extraction of Metals

19. Carbon and the Reactivity Series
20. Recovering Metals from Their Ores
21. Metallurgical Operations
22. Mining of Minerals
23. Recycling Metals and its Environmental Impact
24. Advantages of Recycling
25. Social and Economic Issues of Recycling

## 9.4 Iron

26. Occurrence of Iron
27. Metallurgy of Iron
28. More on Metallurgy of Iron
29. From Iron to Steel
30. Steel Alloys
31. Uses of Iron and Steel
32. Rusting of Iron
33. Prevention of Corrosion
34. Zinc Coating
35. Tin Coating

## 9.5 Aluminium

36. Occurrence of Aluminium
37. Metallurgy of Aluminium

38. Purification of Bauxite
39. Electrolysis of Pure Alumina
40. Corrosion of Aluminium
41. Uses of Aluminium

# Chapter # 10

## Atmosphere and Environment (44 Videos)

### 10.1 Air

1. Salts
2. Composition of Atmosphere
3. Properties of Salt
4. Investigating the Composition of Air
5. Reaction of Bases with Acids
6. Fractional Distillation of Liquid Air
7. Water of Crystallization
8. Uses of oxygen
9. Respiration
10. Combustion
11. Pollutants
12. More on Pollutants
13. Types of Pollutants, Oxides
14. Carbon Monoxide and Chlorofluorocarbons as Air Pollutants
15. Pollutants of Nitro Compound
16. Sulphur Dioxide and Nitrogen Dioxide as Air Pollutants
17. Acid Rain
18. Mechanism of Acid Rain
19. Effect of Acid Rain
20. Sources of Air Pollutants
21. Smog as Pollutant
22. Depletion of Ozone
23. Role of Chlorofluorocarbons in Destroying Ozone
24. Effect of Ozone Depletion
25. The Carbon Cycle
26. Green House Effect
27. Global Warming
28. Effect of Global Warming

### 10.2 Water

29. Preparation of Soluble salt
30. Water For Life
31. More on Soluble Salt
32. Composition of Water

33. Chemical Properties of Acids
34. Sources of Water
35. Reaction of Bases with Acids
36. Impurities in Water
37. Reaction of Acids with Carbonates and Bicarbonates
38. Filtration to Remove Solids from Water
39. Preparation of Zinc Sulphate Crystals
40. Use of Carbon to Remove Tastes and Odours from Water
41. Chlorination to Disinfect the Water
42. Desalination of Sea Water
43. Distillation
44. Uses of Water

# Chapter # 11

## Organic Chemistry (80 Videos)

### 11.1 Alkanes

1. The Importance of Nitrogen and its Compounds
2. Concept of Organic Chemistry
3. The Nitrogen Cycle
4. General Characteristic of Organic Compounds
5. More on General Characteristic of Organic Compounds
6. Sources of Organic Compounds
7. Homologous Series
8. Introduction to Hydrocarbons
9. Saturated Hydrocarbons
10. Alkanes
11. More on alkanes
12. Isomerism in Alkanes
13. Physical properties of Alkanes
14. Combustion of Alkanes
15. Halogenations of Alkanes

### 11.2 Alkenes

16. The Haber's Process
17. Unsaturated Hydrocarbons
18. More on Haber process
19. Alkenes
20. Preparation of Alkenes
21. Cracking of Petroleum
22. Importance of Cracking
23. Confirmation Test for Unsaturation
24. Isomerism in Alkenes



25. Physical properties of Alkenes
26. Combustion of Alkenes
27. Combustion and Polymerisation of Ethene
28. Hydrogenation of Alkenes
29. Reaction of Ethene with Water
30. Halogenations of Alkenes

### **11.3 Alcohols**

31. Reversible Reaction in Ammonia
32. What are Alcohols?
33. Dynamic Equilibrium in Ammonia
34. Functional Groups,Alcoholic Group
35. Preparation of Ethanol by Fermentation
36. Industrial Manufacture of Alcohol
37. Physical Properties of Alcohol
38. Chemical Properties of Alcohols
39. Combustion of Alcohols
40. Oxidation of Alcohols
41. Uses of alcohol

### **11.4 Carboxylic Acids**

42. Reaction of Ammonia with Acids
43. Carboxylic Group
44. Displacement of Ammonia from its Salt
45. Preparation of Ethanoic Acid
46. Properties of Ethanoic Acid
47. Physical Properties of Carboxylic Acids
48. Chemical Properties of Carboxylic Acids
49. Ester Linkage
50. Esterification
51. What Happens in Esterification?
52. Uses of Esters

### **11.5 Polymers**

53. Eutrophication
54. Macromolecules
55. Manufacture of Fertilisers
56. Natural and Synthetic Polymers
57. More on Manufacture of Fertilisers
58. Addition Polymerisation
59. Preparation of Nitric Acid in Laboratory
60. Polymerisation of Alkenes
61. Ammonia as Solvent
62. Some Addition Polymers
63. Uses of Addition Polymers
64. Condensation Polymerisation
65. Nylon
66. Terylene

- 67. Structure of some Plastics
- 68. Use of Man-Made Fibres
- 69. Sources and Usage of Plastics
- 70. Deduction of Structural Formula of a Monomer from its Polymer
- 71. Disadvantages of Using Plastics
- 72. Disposal of Plastics
- 73. Natural Macromolecules
- 74. Carbohydrates
- 75. Polysaccharides
- 76. Protein
- 77. Aminoacids as Building Block of Protein
- 78. Lipids
- 79. Fatty Acids
- 80. Hydrolysis

# **O Levels (Computer Science)**

(Total Videos # 177)

## **Chapter # 01**

### **Binary Systems and Hexadecimals** (11 Videos)

- 1.1** **Introduction**
  - 1. Introduction to Data Representation
  - 2. Introduction to Number System
- 1.2** **The binary system**
  - 3. Decimal to Binary 1

4. Decimal to Binary 2
5. Decimal to Binary 3
6. Binary to decimal
- 1.3 Measurements of the size of Computer Mem**
  7. How to find Memory Size and Processor Speed
  8. Units of Computer Memory
  9. Examples on Unit Conversion
- 1.4 The Hexadecimal System**
  10. Decimal to Hexadecimal , Hexadecimal to Decimal
  11. Binary to Hexadecimal and Hexadecimal to Binary

## Chapter # 02

### Communcation and Internet technologies (21 Videos)

- 2.1 Introduction**
  1. What is data communication
- 2.2 Data Transmission**
  2. Data communication terminologies
  3. Components of communication System
  4. Properties of Good communication System
  5. Transmission modes of Computer Network
  6. Parallel Transmission
  7. Synchronous and Asynchronous Transmission
  8. Comparison between Synchronous and Asynchronous
  9. Common types of communication port
- 2.3 Error Checking methods**
  10. The Parity Bit : Check for Errors
- 2.4 Internet technologies**
  11. What is Internet
  12. Applications of Internet
  13. WWW : World Wide Web
  14. Means of connecting Internet
  15. Terminologies related to Internet
  16. More on Terminologies
  17. Internet Protocol Address
  18. Introduction to Hyper text Mark Up Language ( HTML)
  19. Creating and Displaying HTML Documents
  20. Tags Used to Markup HTML Elements
  21. File Transfer Protocol

# Chapter # 03

## Logic Gates and Circuits (11 Videos)

- 3.1 Introduction to Logic Gates
  - 1. Logic Gates and Circuits : An Overview
- 3.2 Truth Tables
  - 2. Truth Table
- 3.3 The function of six logic gates
  - 3. AND Gate
  - 4. OR Gate
  - 5. NOT Gate
  - 6. NOR Gate
  - 7. NAND Gate
  - 8. XOR Gate
  - 9. XNOR Gate
- 3.4 Logic Circuits
  - 10. Boolean function to Logic circuit conversion
- 3.5 Logic Circuits in the Real World
  - 11. Simplification techniques

# Chapter # 04

## Operating Systems and Computer Architect (15 Videos)

- 4.1 Operating Systems
  - 1. The Concept of Operating System
  - 2. Objectives of Operating System
  - 3. Functions of Operating System
  - 4. More on Functions of Operating System
- 4.2 Interrupts
  - 5. Interrupts
- 4.3 Computer Architecture
  - 6. Introduction to Computer Architecture
  - 7. Bus and Types of Buses
  - 8. Von Neumann Model

9. Central Processing Unit : ALU , Control Unit
10. General Purpose Registers
11. CPU terminologies : Data Path , CPU Cycle , Control Path
12. Memory Operations
13. Internal Processor Memory : Registers
14. Microprocessor

#### **4.4 The fetch Execute Cycle**

15. Instruction cycle

## **Chapter # 05**

### **Input and Output devices (21 Videos)**

#### **5.1 Introuduction**

1. I/O Hardware : Input Output Devices

#### **5.2 Input devices**

2. Scanners and Its types
3. More on Scanners
4. Barcode and QR readers
5. digital camera
6. Keyboard
7. touch Pad
8. Joy Stick
9. track Ball
10. mouse
11. Touch screen
12. Light Pen
13. microphone
14. Input sensors

#### **5.3 Output devices**

15. Printers and Its types
16. Monitors
17. More on Monitor
18. Plotter
19. Speakers
20. Multimedia Projector
21. 3D and holographic imaging and Virtual Reality

## **Chapter # 06**

### **Memory and Data Storage (09 Videos)**

## 6.1 Introduction

1. Storage Hardware : Memory

## 6.2 Memory and Storage

2. Computer Memory : Why it is necessary for Computer
3. Main Memory
4. RAM : Random Access Memory
5. Types of RAM : DRAM and SRAM
6. ROM : Read Only Memory
7. Hard Disk
8. Flash Memory Cards
9. CD ( Compact Disk)

# Chapter # 07

## High and Low Level Languages (12 Videos)

### 7.1 Programming Languages

1. Programming Languages : An Overview
2. Machine Language
3. Assembly Language
4. High Level Language
5. Characteristics of High level languages
6. Computer Program

### 7.2 Translators

7. Language Translators : An Overview

### 7.3 What happens when things go wrong

8. Meaning of 'program syntax'
9. Types of Error: Syntax error
10. Types of Error: Runtime error
11. Types of Error: Logical error
12. Understanding of Integrated Development Environment : IDE

# Chapter # 08

## High and Low Level Languages (17 Videos)

### 8.1 Introduction

1. What is Information security

## **8.2 Security and Data Integrity**

2. Privacy issues and hacking
3. Computer Virus : What is Virus and How it Spread
4. Virus Hoax
5. Worm , Adware , Spyware , Malware
6. Types of Virus
7. Hacker and Cracker
8. Phishing in Information Security

## **8.3 Loss of Data and Data Compression**

9. Data Backup

## **8.4 Firewalls and Proxy servers**

10. Firewalls , Encryption and Audits

## **8.5 Encryption**

11. Everyday Encryption on Internet and Cipher Methods

## **8.6 Applications**

12. Authentication Methodologies : Password and Pin Number
13. Access Card and Biometrics
14. Multi Model Authentication
15. Information security Terminologies

## **8.7 Computer Ethics**

16. Areas of Computer Ethics : Information Accuracy

## **8.8 Free Software, Free Ware, and Shareware**

17. Software terminologies

# **Chapter # 09**

## **Problem Solving and Design (15 Videos)**

### **9.1 Introduction**

1. Computer System and Its Components
2. What is Top Down Design
3. What is a Flow chart
4. Basic Principles to write a Pseudo Code
5. Header files and reserved words in C++
6. Procedural languages

### **9.2 Algorithms**

7. What is an Algorithm
8. How to write an Algorithm
9. Algorithm examples
10. Flow Chart Examples

- 11. Flow Chart Examples\_2
- 9.3 Test Data**
  - 12. Test Data in Algorithms
- 9.4 Validation and Verification**
  - 13. Validation and Verification techniques in Algorithms
- 9.5 Using Trace tables**
  - 14. Using trace tables in testing Algorithm
- 9.6 Producing Algorithms**
  - 15. Examples: Producing an effective Algorithm

# Chapter # 10

## Pseudo code and Flow charts (17 Videos)

### **10.1 Conditional Statements**

- 1. What is Control Structure
- 2. Unconditional transfer of control
- 3. Why a Control Structure is important in Programming
- 4. Introduction to decision and selection statements
- 5. Introduction to if-else structure
- 6. if-else example problems
- 7. What is Switch.. Case
- 8. Switch default statement
- 9. Examples on Switch .. Case

### **10.2 Loop Structure**

- 10. What is Repetition Structure
- 11. Why we need a Repetition Structure in Programming
- 12. Types of Loop

### **10.3 Input and Output Statements**

- 13. scanf function in C
- 14. printf function in C

### **10.4 Standard Flow chart and Symbols**

- 15. Basic Componets to design a Flow Chart
- 16. Advantages of Flow chart
- 17. Flowchart requirements



# Chapter # 11

## Programming Concepts (06 Videos)

### 11.1 Declaration and Use of Variables

1. What are Constants
2. Computer Program to illustrate Constants
3. The Concept of Variable
4. Rules for naming variable
5. Declaration and initialization of variable

### 11.2 Basic Data type

6. Datatypes in C

# Chapter # 12

## Data Structures , arrays and using Pre r (12 Videos)

### 12.1 Arrays

1. Problem Statement: Why we need Arrays
2. What are Arrays
3. Terminologies used in Arrays
4. Examples on Arrays
5. Defining an Array
6. How to declare an Array in a Program
7. Accessing array index with examples
8. Initialization of Array
9. Fill array index with examples
10. Static Method
11. Dynamic Method Using Loop
12. Traversing an Array

# Chapter # 13

## Databases (10 Videos)

### 13.1 Introduction

1. Introduction to Database

## **13.2 What are database used for**

2. Objectives of Database

## **13.3 Structure of Database**

3. Keys : Primary Key

4. Relation and Table

5. Degree of a Relationship

## **13.4 Practical Use of Database**

6. Create Database Using Database Wizard

7. Creating a New Table

8. Introduction to Queries

9. Planning a Query

10. Types of Queries : Select Query , Action Query