Revision Notes
Chapter –12
Algebraic Expressions

- **Algebraic expressions** are formed from **variables** and **constants**. We use the operations of **addition, subtraction, multiplication** and **division** on the variables and constants to form expressions. For example, the expression
  $4xy + 7$ is formed from the variables x and y and constants 4 and 7. The constant 4 and the variables x and y are multiplied to give the product $4xy$ and the constant 7 is added to this product to give the expression.
- **Variable:** Symbols which are used to represent or replace numbers. They are denoted as x, y, z, a, b, c...... and can take different numerical values. We generally use small letters to represent variables.
- **Constant:** A symbol having a fixed numerical value. Example: 2, -10, etc.
- Expressions are made up of **terms**. Terms are **added** to make an expression. For example, the addition of the terms $4xy$ and 7 gives the expression $4xy + 7$.
- A term is a **product of factors**. The term $4xy$ in the expression $4xy + 7$ is a product of factors x, y and 4. Factors containing variables are said to be **algebraic factors**.
- The **coefficient** is the numerical factor in the term. Sometimes anyone factor in a term is called the coefficient of the remaining part of the term.
- Any expression with one or more terms is called a **polynomial**.
- Specifically a one term expression is called a **monomial**.
- A two-term expression is called a **binomial.**
- A three-term expression is called a **trinomial**.
- Terms which have the same algebraic factors are **like**terms. Terms which have different algebraic factors are **unlike** terms. Thus, terms $4xy$ and $– 3xy$ are like terms; but terms $4xy$ and $– 3x$ are not like terms.
- The **sum** (or **difference) of two like terms** is a **like** term with coefficient equal to the **sum** (or **difference) of the coefficients** of the two like terms. Thus,
  $8xy – 3xy = (8 – 3)xy$, i.e., $5xy$.
- When we **add** two algebraic expressions, the like terms are added as given above; the **unlike** terms are **left as they are**. Thus, the sum of $4x^2 + 5x$ and

2x + 3 is $4x^2 + 7x + 3$; the like terms 5x and 2x add to 7x; the unlike terms $4x^2$ and 3 are left as they are.

- In situations such as solving an equation and using a formula, we have to **find the value of an expression**. The value of the expression depends on the value of the variable from which the expression is formed. Thus, the value of 7x – 3 for x = 5 is 32, since 7(5) – 3 = 35 – 3 = 32.

- **Rules and formulas** in mathematics are **written** in a concise and general form using algebraic expressions: Thus, the area of rectangle = *lb,* where *l* is the length and *b* is the breadth of the rectangle.

- The general (*nth*) term of a number pattern (or a sequence) is an expression in *n*.

- Thus, the *nth* term of the number pattern 11, 21, 31, 41, . . . is (10*n* + 1).