Mathematics
(Chapter – 2)(Polynomials)
(Class – 9)
Exercise 2.1

Question 1:
Which of the following expressions are polynomials in one variable and which are not?
State reasons for your answer.

(i) $4x^2 - 3x + 7$ **(ii)** $y^2 + \sqrt{2}$ **(iii)** $3\sqrt{t} + t\sqrt{2}$

(iv) $y + \dfrac{2}{y}$ **(v)** $x^{10} + y^3 + t^{50}$

Answer 1:
(i) $4x^2 - 3x + 7$ Polynomials in one variable as it contains only one variable x.

(ii) $y^2 + \sqrt{2}$ Polynomials in one variable as it contains only one variable y.

(iii) $3\sqrt{t} + t\sqrt{2} = 3t^{\frac{1}{2}} + t\sqrt{2}$, It is in one variable but not a polynomial as it contains $(t^{\frac{1}{2}})$, in which power is not a whole number.

(iv) $y + \dfrac{2}{y} = y + 2y^{-1}$, It is in one variable but not a polynomial as it contains (y^{-1}), in which power is not a whole number.

(v) $x^{10} + y^3 + t^{50}$, It is a polynomials in three variable as it contains three variable (x, y, t).

Question 2:
Write the coefficients of x^2 in each of the following:

(i) $2 + x^2 + x$ (ii) $2 - x^2 + x^3$ (iii) $\dfrac{\pi}{2}x^2 + x$ (iv) $\sqrt{2}x - 1$

Answer 2:
(i) In $2 + x^2 + x$ में x^2 is 1.

(ii) In $2 - x^2 + x^3$ the coefficients of x^2 is -1.

(iii) In $\dfrac{\pi}{2}x^2 + x$ the coefficients of x^2 is $\dfrac{\pi}{2}$.

(iv) In $\sqrt{2}x - 1 = 0. x^2 + \sqrt{2}x - 1$ the coefficients of x^2 is 0.

Question 3:
Give one example each of a binomial of degree 35, and of a monomial of degree 100.

Answer 3:
A binomial of degree 35 = $x^{35} + 3$

A monomial of degree 100 = $3x^{100}$

Question 4:
Write the degree of each of the following polynomials:

(i) $5x^3 + 4x^2 + 7x$ **(ii)** $4 - y^2$ **(iii)** $5t - \sqrt{7}$ **(iv)** 3

Answer 4:
(i) The degree of $5x^3 + 4x^2 + 7x$ is 3.

(ii) The degree of $4 - y^2$ is 2.

(iii) The degree of $5t - \sqrt{7} = 5t^1 - \sqrt{7}$ is 1.

(iv) The degree of $3 = 3x^0$ is 0.

Question 5:

Classify the following as linear, quadratic and cubic polynomials:

(i) $x^2 + x$ **(ii)** $x - x^3$ **(iii)** $y + y^2 + 4$ **(iv)** $1 + x$

(v) $3t$ **(vi)** r^2 **(vii)** $7x^3$

Answer 5:

(i) $x^2 + x$ Quadratic polynomial.

(ii) $x - x^3$ Cubic polynomial.

(iii) $y + y^2 + 4$ Quadratic polynomial.

(iv) $1 + x$ Linear polynomial.

(v) $3t$ Linear polynomial.

(vi) r^2 Quadratic polynomial.

(vii) $7x^3$ Cubic polynomial.