Important models in UNIT-II

1. construct difference table and express y as a function x by using Newton's forward / backward interpolation formula for the given table of values.

2. Find the interpolating polynomial which takes the following values $(x_0, y_0), (x_1, y_1), \ldots, (x_n, y_n)$ using Newton's forward / backward / Lagrange's / Newton's divided difference interpolation formula.

3. Estimate the value of $f(a)$ from the available data.

x:	x_0	x_1	$\ldots$	x_n
$f(x)$:	y_0	y_1	$\ldots$	y_n

4. Given the values of x and $f(x)$ in the form of a table. Evaluate $f(a)$, using Newton's forward / Newton's backward / Lagrange's / Newton's divided difference interpolation formula.

5. Using Lagrange's formula, express the function $f(x)$ as a sum of partial fractions.

6. Evaluate $\int_{a=x_0}^{b=x_0+nh} f(x)\,dx$ using (i) Trapezoidal rule
(ii) Simpson's $\frac{1}{3}$ rd rule.
(iii) Simpson's $\frac{3}{8}$ th rule.

7. Given that x and $f(x)$ in the form of a table.

x:	$x_0 = a$	x_1	$\ldots$	$x_n = b$
$f(x)$:	y_0	y_1	$\ldots$	y_n

evaluate $\int_a^b f(x)\,dx$ using (i) Trapezoidal rule
(ii) Simpson's $\frac{1}{3}$ rd rule
(iii) Simpson's $\frac{3}{8}$ th rule.

8. Use Trapezoidal / Simpson's $\frac{1}{3}$ rd / Simpson's $\frac{3}{8}$ th rule to estimate the integral $\int_{a=x_0}^{b=x_0+nh} f(x)\,dx$ taking m intervals.

9. Use Trapezoidal / Simpson's $\frac{1}{3}$ rd / Simpson's $\frac{3}{8}$ th rule to estimate the integral $\int_{a=x_0}^{b=x_0+nh} f(x)\,dx$ by taking m ordinates.

10. Using picard's method / Euler's method / Runge-Kutta method of 4th order, obtain a solution upto n^{th} approximation of the equation $\frac{dy}{dx} = f(x,y)$, $y(x_0) = y_0$.

11. Apply picard's method / Euler's method / Runge-kutta method of 4th order, find an approximate value of y for any given x. Given that $\frac{dy}{dx} = f(x,y)$, $y(x_0) = y_0$.

<u>Bits</u>

1. All interpolation formulae.
2. All integration formulae.
3. All iterative formulae.