10. (a) A person runs the same race track for five consecutive days and it is timed as follows :

Days (x) :	1	2	3	4	5
Time (y) :	15.30	15.10	15.00	14.50	14.00

Make a least square fit to the above data using a function $a+\frac{b}{x}+\frac{c}{x^2}$.

Or

(b) Find the approximate values of the integral $\int_1^2 \frac{dx}{x}$. Using

(i) Trapezoidal rule and

(ii) Simpson's rule with h = 0.25 and 0.125.

11. (a) (i) Solve by Euler's method, the equation $\frac{dy}{dx}=x+y, y(0)=0$. Choose h = 0.2 and compute $y(0.4)$ and $y(0.6)$.

(ii) Write a note on Multi step methods.

Or

(b) Tabulate the solution of $\frac{dy}{dx}=x+y, y(0)=1$, $x <= 0.5, h=0.1$, using Predictor Corrector methods.

COMPUTER BASED NUMERICAL METHODS

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions.

1. (a) Explain various types of errors with suitable examples.

Or

(b) Write a note on Flow Chart. Give an example.

2. (a) Find a real root of the equation $\cos x = 3x - 1$ correct to 3 decimal places by using iteration method.

Or

(b) Explain the Birge-Vieta method.

3. (a) Define a positive definite matrix M. Also explain complete and partial pivoting.

Or

(b) Solve the following system of equations by using Gauss Elimination method.

$2x + y + z = 10$

$3x + 2y + 3z = 18$

$x + 4y + 9z = 16.$

4. (a) Solve the system of equations by Gauss-Seidel method.

$83x + 11y - 4z = 95$

$7x + 52y + 13z = 104$

$3x + 8y + 29z = 71.$

Or

(b) Explain the power method to find the eigen value of a matrix.

5. (a) From the data given, find the forward and backward difference polynomials. Also interpolate at $x = 0.25$ and $x = 0.35$.

x:	0.1	0.2	0.3	0.4	0.5
$f(x)$:	1.40	1.56	1.76	2.00	2.28

Or

(b) Write a note on Legendre polynomials.

6. (a) Write a note on finite differentiation.

Or

(b) Find the area bounded by the curve and the x-axis from $x = 7.47$ to $x = 7.52$, from the following table.

x:	7.47	7.48	7.49	7.50	7.51	7.52
$f(x)$:	1.93	1.95	1.98	2.01	2.03	2.06

7. (a) Using Taylor series, find $y(0.1)$ correct to four decimal places if $y(x)$ satisfies $y' = x - y^2$ and $y(0) = 1$.

Or

(b) Using Runge-Kutta second order formula, find $y(0.1)$ and $y(0.2)$ correct to four decimal places when $\frac{dy}{dx} = y - x$; $y(0) = 2$.

PART B — ($4 \times 10 = 40$ marks)

Answer ALL questions.

8. (a) Apply the Graeffe's root squaring method to find the roots of the equation $x^3 - 6x^2 + 11x - 6 = 0$ correct to two decimal places.

Or

(b) Using Bairstow's method to obtain the quadratic factor of the equation $x^4 + 3x^3 + 20x^2 + 44x + 54 = 0$ with $(p, q) = (2, 2)$ and perform two iterations.

9. (a) Explain partition method. Find the inverse of the matrix $A = \begin{bmatrix} 2 & 3 & -1 \\ 3 & 1 & 2 \\ -1 & 2 & -1 \end{bmatrix}$ by Partition method.

Or

(b) Solve the system of equations by the method of decomposition.

$2x + y + 4z = 12$

$8x - 3y + 2z = 20$

$4x + 11y - z = 33.$

JAVA PROGRAMMING

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions.

1. (a) Write notes on TFTP.

Or

(b) Write notes on GOPHER.

2. (a) What is RGB color model? Explain.

Or

(b) What is Data independence? Explain.

3. (a) What is Entity? Explain with suitable example.

Or

(b) Explain about increment and Decrement operator with example.

4. (a) What is command line arguments? Explain.

Or

(b) Explain inner classes with suitable example.