1. (a) What are the three main functional elements of a Computer? Briefly describe the purpose of each functional elements of the computer.  
(b) Compare and contrast the differences among mini and microcomputers. [10+6]

2. (a) Write a brief notes on user interface features of an operating system.  
(b) Write short notes on the program running features in operating system. [8+8]

3. (a) What are the advantages of computer programming languages.  
(b) What are the differences between compiler and interpreter. [8+8]

4. Explain about any four common media for data communication. [16]

5. Describe the customizing word and list the common word options and their description by taking the location and option name. [16]

6. (a) Briefly explain the Gauss - Seidel Method and give the algorithm.  
(b) Obtain the solution of the following system using Gauss - Seidel iteration Method  
\[ \begin{align*} 
2x_1 + x_2 + x_3 &= 5 \\
3x_1 + 5x_2 + 2x_3 &= 15 \\
2x_1 + x_2 + 4x_3 &= 8 
\end{align*} \] [8+8]

7. (a) Explain Newton’s causal difference interpolation method.  
(b) Determine the piecewise quadratic fit \( p(x) \) to \( f(x) = (1 + x^2)^{-1/2} \) with knots at \(-1, -1/2, 0, 1/2, 1\). [8+8]

8. Solve \( y' = 4-2x, \ y(0) = 2 \), with \( h = 0.5 \)  
\[ \text{Using} \]  
(a) Improved Euler method and  
(b) Modified Euler method  
(c) compare the results with the theoretical values. [6+5+5]
I B.Tech Supplementary Examinations, Aug/Sep 2008
INFORMATION TECHNOLOGY AND NUMERICAL METHODS

Time: 3 hours Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Give a broad classification scheme of computers. Explain each type in brief. [16]

2. (a) What are RISC and CISC processors? Explain.
(b) Explain about parallel processing.
(c) Explain about Motorola processors. [6+5+5]

3. (a) Explain the following text codes:
   i. EBCDIC.
   ii. ASCII.
   iii. Unicode.
(b) What are interrupts? Explain. [10+6]

4. Explain the following internet terminology: [4+3+3+3+3]
   (a) HTML tag
   (b) Web browser
   (c) HTTP
   (d) URL
   (e) Homepage.


6. Find the iterative equation based on Newton-Raphsons method for finding \( \sqrt{N}, \frac{1}{N}, N^{1/3} \), where N is a real Number. Apply the Methods to N=18 to obtain the results correct to 2 decimals. [16]

7. (a) Find the error term in Lagrange interpolation formula.
(b) The population between 1921-1981 for every 10 years is 35, 42, 58, 84, 120, 165, 220 (in thousands). Using difference tables interpolate for population in the year 1925 and 1975. [8+8]

8. (a) Explain Predictor corrector method.
(b) Consider the initial value problem $y' = x(y + x) - 2$, $y(0) = 2$ using step sizes $h = 0, 0.2$ and $0.15$ and Euler’s method, Compute approximation to $y(0.6)$ upto 5 decimals. [8+8]
I B.Tech Supplimentary Examinations, Aug/Sep 2008
INFORMATION TECHNOLOGY AND NUMERICAL METHODS
Time: 3 hours
Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What is a cache memory? How is it different from a primary memory? What is the advantage of using Cache memory?
   (b) Explain the idea of cache memory in computers. How does the presence of Cache increase the processing speed? [8+8]

2. (a) What are RISC and CISC processors? Explain.
   (b) Explain about parallel processing.
   (c) Explain about Motorola processors. [6+5+5]

3. (a) What are the characteristics of fourth generation high-level languages.
   (b) What are the advantages of ‘C’ language over other third generation languages. [8+8]

4. Explain:
   (a) Network servers
   (b) File servers
   (c) Application servers
   (d) Spooling. [4+4+4+4]

5. Describe the customizing word and list the common word options and their description by taking the location and option name. [16]

6. (a) Evaluate the square root of 5 by applying the method of Successive approximation.
   (b) Explain Convergence of Successive Approximation method. [10+6]

7. (a) Define finite differences and show how they are used for interpolation.
   (b) Given x = 0.4, 0.5, 0.7, 0.8 and f(x) = -0.916, -0.693, -0.357, -0.223. Estimate f(0.6) using Lagrange method. [8+8]

8. (a) Evaluate $I = \int_{0}^{0.8} (1+(\sin x/x)) \, dx$ with an error $< 10^{-5}$ using Simpson’s rule.
(b) Give an algorithm for linear regression. [9+7]
I B.Tech Supplimentary Examinations, Aug/Sep 2008
INFORMATION TECHNOLOGY AND NUMERICAL METHODS
Time: 3 hours Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What are the prime responsibilities of output devices? List and explain them in brief.
(b) Describe the role and importance of memory unit in a computer. [10+6]

2. Write a brief notes on the following: [4+4+4+4]
   (a) Multi-processing operating system
   (b) Time sharing system
   (c) Multi tasking OS
   (d) Batch Processing.

3. (a) What is meant by ‘portability’ in computer languages.
(b) Distinguish between third generation and fourth generation languages.[6+10]

4. (a) What is teleconference? What is videoconferencing?
(b) Explain: bridge, routes, gateway. [8+8]


6. (a) Explain the iterative method approach in solving the problems.
(b) Explain the classification of iterative method based on the number of guesses. [8+8]

7. Find the interpolation polynomial for x = 3.2, 2.7, 1.0, 4.8, 5.6, f(x) = 22, 17.8, 14.2, 38.3, 51.7, using difference tables and thus find f(3). [16]

8. (a) Derive an expression for the truncation error in Taylor Series (Single Step Method) method.
(b) Given \( y''' + 2y'' + y' - y = \cos(x) \)
    \( y(0) = 0, y'(0) = 1, y''(0) = 2 \)
    Compute \( y(1), y'(1), y''(1) \) using Taylor Series Solution with \( h = 1 \). [8+8]