Time: 3hrs   Max. Marks: 75

SECTION - A

Answer ALL questions.   **4 X 15 =60M**

1.   a) Define Listening Process and explain different types of listening with appropriate
        examples   15M

                                (OR)

        b) What are different barriers to Listening? Suggest various effective strategies for
        better Listening   15M

2.   a) Describe English sounds according to articulation with the help of a Phonetic chart.
                                                                                        15M

                                (OR)

        b) What are effective speaking strategies for Public Speaking   15M

3.   a) Explain different types of reading   15M
                                (OR)
        b) Define Reading Process illustrating various stages   15M

4.   a) Write a letter to newspaper editor describing university   15M
                                (OR)
        b) Attempt a technical paper on any one of the following   15M
            1. Computer Programming
            2. Engineering Mechanics
            3. Electronics and Networking

SECTION - B

5. Answer any FIVE questions   **5 X 3 = 15M**
        a.   Precise writing
        b.   Prepare your Resume
        c.   Skimming
        d.   Intonation
        e.   Accent
        f.   Conversations
        g.   Review Writing
        h.   Summarizing and Paraphrasing

Time: 3hrs   Max. Marks: 75

SECTION - A

Answer ALL Questions.   4 X 15 = 60M

1. a) Test for consistency and solve
    $2x - 3y + 7z = 5; 3x + y - 3z = 13; 2x + 19y - 47z = 32$.

    b) Verify Cayley-Hamilton Theorem for the matrix A and find its inverse, where
    $$A = \begin{bmatrix} 7 & 2 & -2 \\ -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}. .$$ [7+8]

                                              (OR)

    c) Find Eigen values and Eigen vector of $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$.

    d) Determine the rank of a matrix $A = \begin{bmatrix} -2 & -1 & -3 & -1 \\ 1 & 2 & 3 & -1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & -1 \end{bmatrix}$ [8+7]

2. a) Find the Laplace transform of $cos7t + sin9t$.

    b) Using Laplace transform, Evaluate $\int_0^\infty \frac{cosat - cosbt}{6} dt$.   [7+8]

                                              (OR)

    c) Find the Laplace transform of $e^{3t} - 2e^{-2t} + sin2t + cos3t + sinh3t - cos4t + 9$

    d) Find $L^{-1}\{2S^3 + {}^3/{}_{S^2(S^2+1)(S^2+2)}\}$.   [8+7]

3. a) Solve in series $(1 - x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} + 4y = 0$.

    b) Show that $J_{5/2}(x) = \sqrt{2/\pi x} \left[\frac{3-x^2}{x^2} sinx - (3/2)cosx\right]$.   [8+7]

                                              (OR)

    c) Show that $J_4(x) = \left(\frac{48}{x^3} - \frac{8}{x}\right)J_1(x) + \left(1 - \frac{24}{x^3}\right)J_0(x)$

    d) Show that $\int_0^\pi e^{-ax} J_0(bx)dx = \frac{1}{\sqrt{a^2+b^2}}, a > 0$.   [8+7]

4. a) show that $P_0(x) = 1, P_1(x) = x, P_2(x) = \frac{3x^2-1}{2}, P_3(x) = \frac{1}{2}(5x^3 - 3x)$,

    $P_4(x) = \frac{1}{8}(35x^4 - 30x^2 + 3)$

    b) Show that $\int_{-1}^1 x^2 P_{n-1}P_{n+1}dx = \frac{2n(n+1)}{(2n-1)(2n+1)(2n+3)}$ [8+7]

                                              (OR)

    c) Express $f(x) = x^4 + 3x^3 - x^2 + 5x - 2$ in term of legendre Polynomials.

d) Prove that $(2n + 1)(1 - x^2)P_n'(x) = n(n + 1)P_{n-1}(x) - P_{n+1}(x)$.   [7+8]

SECTION - B

5 X 3 = 15M

5.   **Answer any FIVE questions**

a.   Write the statement of Cayley-Hamilton Theorem and Define rank of the matrix.

b.   The inverse of the matrix $\begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$ is $\begin{bmatrix} 3 & 2 & 6 \\ 1 & 1 & k \\ 2 & 2 & 5 \end{bmatrix}$ then find the value of K.

c.   Find the inverse Laplace Transform $S + 3/S^2 - 10S + 29$

d.   Evaluate $\frac{dy}{dx}(x^n)J_n(x) = (x^n)J_{n-1}(x)$

e.   Show that $\int_{-1}^{1}(1 - x^2) P_n'(x)P_n'(x)dx = \begin{cases} 0 & when\ m \neq n; \\ \frac{2n(n+1)}{(2n+1)} & when\ m = n. \end{cases}$

f.   Find the orthogonality of the $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}$

g.   Write the Statement of Rodrigue's formula and recurrence formula of for Bessel's function.

h.   A function is periodic in (0,2b) and is defined as $f(t) = \begin{cases} 1 & if\ 0 < t < b; \\ 0 & if\ b < t < 2b. \end{cases}$

Find the Laplace Transform of f(t).

Time: 3hrs   Max. Marks: 75

SECTION - A

Answer ALL questions   **4 x 15 = 60M**

1.	a) Define Recursive Process. Explain with example	5M
`	b) Explain Simulation Process in Recursion	10M
	(OR)	
	c) What is Stack? Explain various operations in Stack	6M
	d) Explain the process of conversion from infix expression to postfix form	9M
2.	a) Explain Queue as an Abstract Data Type with example	6M
	b) How to implement Queue using Arrays. Explain with example	9M
	(OR)	
	c) What is Linked List? Explain representation of Tree operations	5M
	d) Explain implementation of Circular Linked List with example	9M
3.	a) What is Tree? Explain representation of Tree operations	5M
	b) Explain various Tree Traversal techniques	10M
	(OR)	
	c) Define Graphs? How to represent Graph. Explain with Example	5M
	d) Explain Minimal Spanning Tree with example	10M
4.	a) Explain Sequential Search method with example	7M
	b) Explain Binary Search technique with example	8M
	(OR)	
	c) Explain Bubble Sort with example	7M
	d) Explain Quick Sort with example	8M

SECTION - B

5.   **Answer any FIVE questions**   **5 x 3 = 15M**
     a.   Arrays
     b.   Stack as Abstract Data type
     c.   Types of Queues
     d.   Doubly linked list representation
     e.   Binary Tree Applications
     f.   Transitive Closure
     g.   Efficiency of Binary Search Technique
     h.   Shell Sort

ADIKAVI NANNAYA UNIVERSITY:: RAJAMAHENDRAVARAM
I BTech (Common to CSE & IT wef 2017-18) **II Semester**
CSEINF204 CHEMISTRY (MODEL QUESTION PAPER)

Time: 3hrs   Max. Marks: 75

SECTION – A

Answer ALL questions   **4 X 15=60M**

1.   a) Write about the following with suitable examples   [7 + 8]
         (i) Addition Polymerization   (ii) Condensation Polymerization
                              (OR)
      b) Write about the following   [7 + 8]
         (i) Thermosetting   (ii) Thermoplastics

2.   a) What is corrosion? Explain the various factors effecting on corrosion.
                              (OR)
      b) Write an essay on corrosion controlling methods

3   a) Write about the following   [7 + 8]
         (i) Hardness of water   (ii) Reverse Osmosis Method.
                              (OR)
      b) Write about the engineering applications of ceramics and refractories.

4   a) Explain the Otto Hoffmann's process fo r the manufacturing of coke
                              (OR)
      b) Write the classification of lubricants and engineering applications of lubricants

SECTION – B

5. Answer any FIVE questions   **5 X 3=15M**

         a.   Write about Ionic Polymerization.

         b.   Write about conducting polymers

         c.   Write about special paints

         d.   Write about metallic coating

         e.   Write the chemical composition of cement

         f.   Write about cement concrete and R.C.C

         g.   Write about ranking of coal

         h.   Explain about Bio gas, LPG and CNG

Time: 3hrs   Max. Marks: 75

SECTION - A

Answer ALL questions   **4 X 15=60M**

1 a) Explain the carrier concentration in intrinsic semiconductor   [15M]

(OR)

b) Derive an Expression for Electron emission from metal   [10M]

c) Differentiate between metals, insulators and semiconductors using energy band diagrams [5M]

2 a) Explain the tunnelling phenomenon. Explain the characteristics of Tunnel diode with the help
   of necessary energy band diagrams   [10M]

b) Explain Schottky diode with necessary sketches?   [5M]

(OR)

c) Draw the circuit of a Half wave rectifier and find out the Ripple factor, % regulation and
   Efficiency.   [10M]

d) Explain the relative merits and demerits of all rectifiers?   [5M]

3 a) With a neat diagram explain the various current components in an NPN Bipolar Junction
   Transistor and hence derive general equation for collector current, Ic   [8M]

b) Sketch the h-model of CE Configuration?   [7M]

(OR)

c) Define Biasing? Draw the fixed bias circuit and obtain the expression for the Stability factor
                                                                                        [8M]

d) Design a self-bias circuit using silicon transistor to achieve a stability factor of 10, with the
   following specifications: V_{cc} = 16V, V_{BE} = 0.7v, V_{CEQ} = 8v, I_{co} = 4mA and β = 50? [7M]

4 a) Explain transistor RC coupled amplifier eith reference to frequency response and mention its
   advantages, disadvantages and applications   [15M]

(OR)

b) Sketch the Drain Characteristics of a MOSFET for different values of V_{GS} and mark different
   regions of operations   [15M]

SECTION – B

Answer any FIVE questions   **5x3=15M**

5.

       a. Define Electronics

       b. Explain about Extrinsic Semiconductor

       c. Define Depletion Region

       d. Explain about Zener Regulator

       e. When does transistor acts as a Switch?

       f. Define three Stability factors

       g. Explain about ohmic and saturation regions

       h. Why FET is also called a Voltage operated device?

Time: 3hrs   Max. Marks: 75

SECTION – A

Answer ALL questions   4x15=60M

1 a) What is Environmental Science? Define its Scope and Importance

(OR)

   b) Define Ecosystem. Explain

2 a) Discuss in detail about the water resource of earth. Add a note on the conflicts of Water usage

(OR)

   b) Explain in detail about the forest resources and their exploitation

3 a) What is Biodiversity? Explain about the services the biodiversity offers to mankind

(OR)

   b) Why should conversation of biodiversity be done. What are the different conversation methods of biodiversity?

4 a) Discuss in detail about the issues involved in environmental ethics. Add a note on their solutions

(OR)

   b) What is EIA? Explain

SECTION - B

Answer any FIVE questions   5 X 3=15M

5.

   a. Rio Summit

   b. Ecological succession

   c. Mineral Resources

   d. Waste land reclamation

   e. Value of Biodiversity

   f. Hotpots of Biodiversity

   g. Water conversation

   h. Ecotourism