# GATE 2024 Question Paper Feb 4
# (Chemical Engineering)

**Ques 1. Consider a Leniar Homogeneous system AX = 0, where A is N × N matrix and X is N × 1 vector. When we solve this 0 is null matrix of N × 1. Let R be the rank matrix for a for a Non-trivial solution.**

    **A. R = N**
    **B. |A| ≠ 0**
    **C. |A| = 0**
    **D. R < N**

**Ans.** C and D

**Ques 2. Which are true for Petroleum / Petrochemicals?**

    **A. Cumene is produced by Alkylation of Benzene and propalene.**
    **B. Hydrocracking is used to convert heavy hydrocarbon to lower hydrocarbon.**
    **C. Vinyl acetate is produced by $CH_4 CH_3 COOH$ is presence of Pd cot.**
    **D. Catalytic reforming is used to convery state chains Alkene to Aromatic.**

**Ans.** A, B and D

**Ques 3. F(x) = $e^x$ - 5x and the value of $X_0$ = 1 then what will be the value of $X_1$?**

**Ans.** 0

**Ques 4. The first non-zero term in the taylor series expansion of (1 - x) - $e^{-x}$, about x = 0**

**Ans.** $-x^2/2$

**Ques 5. P/Q is not equal 1, $(P/Q)^{P/Q} = (P)^{P/Q - 1}$**

    A. $\sqrt{q} = \sqrt{p}$
    B. $P\sqrt{q} = q\sqrt{p}$
    C. $Q^p = P^{2q}$
    D. $Q^p = P^q$

**Ans.** D

**Ques 6. Choose correct option (Chlor-Alkoli Industry)**

    A. Concentration of NaCl in membrane cell > Concentration of NaCl in diapyconcell.
    B. $H_2$ is produced at cathode.
    C. $Cl_2$ is produced at cathode.
    D. NaOH is produced at cathode.

**Ans.** A, C and D

**Ques 7. What will be the argument of $(Z_1 / Z_2)$ = ?**
$Z_1 = -1 + i$
$Z_2 = 2i$

**Ans.** $\pi/4$

**Ques 8. What will the correct pair of μ and σ ?**

**F(x) = 4 / 2√π  e$^{-8(x + 3)^2}$**

**Ans.** μ = -3 and σ = ¼