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**Presidency University**

**Bengaluru**

 **SCHOOL OF MANAGEMENT**

 **MAKE-UP EXAMINATION – SEP 2023**

**Course Code**: PET 316

**Course Name**: FUNDAMENTAL OF PROCESS CALCULATION

**Program**: BTECH PETROLEUM ENGINEERING

**Date**: 03.10.2023

**Time**: 1.00PM – 4.00PM

**Max Marks**: 100

**Weightage**: 50%

 **Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*
3. *Any tables/Chart/Graph or data books required, pl. mention here.*

**Part A [Memory Recall Questions]**

**Answer all the Questions. Each question carries 3 marks. (5Qx 3M=15M)**

1. Describe the stoichiometric co-efficient. (C.O.No.1) [Bloom’s level]

2. Define limiting reactants and excess reactants. (C.O.No.2) [Bloom’s level]

3. Define ideal gas law. (C.O.No.2) [Bloom’s level]

4. Define Amgat’s law and Boyl’s Law. (C.O.No.3) [Bloom’s level]

5. Define mole fraction. (C.O.No.3) [Bloom’s level]

**Part B [Thought Provoking Questions]**

**Answer all the Questions. Each question carries 10 marks. (3Qx15M=45M)**

6. **C3H8 = 150 Kmol/hr**

 **O2= 660 Kmol/hr fed to reactor**.

As per stoichiometric proportion, the excess reactant O2 would have to be 550Kmol/hr. Calculate % of excess O2 supplied. (C.O.No.1) [Comprehensive level]

7. 200 Kmol of H2 reacts with 270kmol of N2 produces 260 kmol of NH3. Assume 95 kmol of H2 is consumed during the reaction. What is the % of conversion of H2?

 (C.O.No.2) [Comprehensive level]

8. Calculate the Kg atoms of carbon which weight is 48 kg. Also calculate the Kg atom of Cl2 which weight is 105 kg. (C.O.No.3) [Comprehensive level]

**Part C [Problem Solving Questions]**

**Answer all the Questions. Each question carries 20 marks. (2Qx20M=40M)**

9. 10000kg/hr of 20 mole% of solution of ethylene dichloride in toluene is fed to middle of distillation column. The distillate contains 98mol% ethylene dichloride and bottom consists of 90mole% toluene. What is the rate of flow of each stream? (C.O.No. 2) [Application level]

10. It is required to make 100 kg of 80%NaOH solution by mixing the following liquids; 20% NaOH solution and 36% NaOH solution. Calculate the quantitate of the two solutions to be mixed.

