Enrollment No. _____

Shree Manibhai Virani and Smt. Navalben Virani Science College (Autonomous), Rajkot

Affiliated to Saurashtra University, Rajkot

SEMESTER END EXAMINATION APRIL - 2018

B. Voc. Pharmaceutical Analysis & Quality Assurance

BVPAQA-401 - PHARMACEUTICAL ENGINEERING

Duration of Exam – 2.30 hrs ***Semester – IV*** ***Max. Marks – 70***

Que. 1 (A) – Answer the following Questions **[10]**

1. What is general mass balance equation for continuous steady state process?
2. What is the law of conservation of mass?
3. 'Material balance involving chemical reactions are more complicated.' Comment on this statement.
4. What is combined ratio? Give its formula.
5. Define mole fraction. Give its equation.
6. Give statement of Amagat's law.
7. What is integral heat of solution?
8. Give equation for energy balance of closed system.
9. Define combustion.
10. The unit of density is _____.

Que. 1 (B) – Answer the following Questions **[20]**

1. What are steady state and unsteady state with respect to any process?
2. Draw a process flow diagram for Distillation and write its overall and individual material balance equations.
3. Give formula for yield and selectivity.
4. Draw a labeled block diagram of the general recycle operation with required stream lines.
5. Derive the unit : (Jule/mol.kelvin) of gas constant R.
6. Give any two differences between Molarity & Molality.
7. Differentiate flow process and non-flow process.
8. Give a brief account on heat.
9. Write difference between flash point and pour point.
10. What is the disadvantage of sulfur content present in liquid fuel?

Que. 2 Answer the following Questions (Any Four) **[20]**

1. Write in detail about Limiting and Excessing Reactants with example.
2. Outline the detailed general procedure for material balance calculation.
3. What is purge ratio? Draw a labeled block diagram of the general recycle operation with purging using required stream lines. Discuss the objectives of recycling.

4. Derive Ideal gas equation.
5. Write a short note oh heat of reaction and heat of combustion.
6. From the ultimate analysis of coal sample; Carbon: 73%, Hydrogen: 4.5%, Nitrogen: 1.5 %, Oxygen: 5.9%, Sulfur: 5%, water: 2.1%, ash: 8%. Calculate the air required and oxygen required for burning of hydrogen, carbon and sulfur on the basis of weight and volume. (Given: air : O_2 = 1 : 0.21; volume of air required per kg of fuel = 22.4Nm^3; one kg of O_2 = 4.32 kg of air)

Que. 3 Answer the following Questions (Any Four) [20]

1. Define Stoichiometry and Stoichiometric equation? Write about Stoichiometric Co-efficient and Stoichiometric ratio with example.
2. Draw a process flow diagram for Evaporation and Filtration with their overall and individual material balance equation.
3. Discus Rault's law for both volatile and non-volatile solutes.
4. Write a note on Dalton's law.
5. Write a short note on standard heat of reaction from heat of formation and combustion.
6. From the ultimate analysis of coal sample; Carbon: 56%, Hydrogen: 6.8%, Nitrogen: 3.4 %, Oxygen: 9.6%, Sulfur: 9.7%, water: 2.5%, ash: 12%. Calculate the air required and oxygen required for burning of hydrogen, carbon and sulfur on the basis of weight and volume. (Given: air : O_2 = 1 : 0.031; volume of air required per kg of fuel = 22.4Nm^3; one kg of O_2 = 4.32 kg of air)