[53/A-22] SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
EXTERNAL EXAMINATION
B.SC. INDUSTRIAL CHEMISTRY
(THIRD SEMESTER)
US03CICH02: Chemical Process Principles
SATURDAY, 24THE November, 2018

Time: 2:00 pm to 5:00 pm **Total Marks: 70**

Q-1 Answer the following multiple choice question. **[10]**

1. Specific gravity of liquid is =_____.
   a. Density of liquid/density of water
   b. Volume
   c. Temperature/pressure
   d. Mass/volume.
2. At normal boiling point atmospheric pressure is_____
   a. 760 mm Hg
   b. 76 mm Hg
   c. 0.76 mm Hg
   d. 7.6 mm Hg
3. Total pressure in the system is equal to the sum of partial pressure is_____.
   a. Parentage
   b. Daltons low
   c. Amagat's low
   d. Barometric pressure
4. The number that precedes the formula of the component involved in a chemical reaction is
   a. Stoichiometric coefficient
   b. Selectivity
   c. Yield
   d. Material factor
5. Excess reactant is in excess than
   a. Stoichiometric requirement
   b. Theoretical requirement
   c. Both (a) and (b)
   d. None of above
6. The amount of heat requires to raise temperature of one kg of substance by 1*k is known as_____.
   a. Heat capacity
   b. Thermal conductivity
   c. Internal energy
   d. Sensible heat
7. Which of the following is a type of energy?
   a. Work
   b. Heat
   c. Kinetic
   d. All of the above
8. The property's value of which is independent on path is.....
   a. Point function
   b. Path function
   c. Heat capacity
   d. Combustion
9. Which of the following adsorption is reversible?
   a. Mechanical adsorption
   b. Chemical adsorption
   c. Physical adsorption
   d. Electrical adsorption
10. A substance on the surface of which the concentration of other substance increases is known as
    a. Adsorbent
    b. Adsorbate
    c. Adsorption
    d. Desorption

Q-2 Answer any ten of following. **[20]**

1. Enlist the applications of ideal gas law equation.
2. State Amagate's law.
3. Define the following terms:
   a. Vaporization
   b. Critical temperature

(P.T.O.)

4. Give the importance of material balance calculation.
5. How batch process is differentiate from continuous process?
6. Define unit operation. Enlist it's four examples.
7. Define the following terms:
   a. Sensible heat
   b. Net calorific value
8. Enlist the names of different types of energy.
9. What is spontaneous combustion?
10. Write B.E.T. equation for adsorption.
11. Draw different type of adsorption isotherm.
12. Define following terms:
    a. Relative saturation
    b. Humidity

Q-3 Discuss the different method used to express the composition of mixtures and solutions in detail. **[10]**

OR

Q.3 Prove that Pressure % =Volume % = Mole % for gaseous mixture. **[10]**

Q-4 a. Discuss the different steps required to solve material balance problems. **[05]**

b. Write a detail note on purge operation. **[05]**

OR

Q-4 a. An evaporator is fed with 15000 kg/hr of a solution containing 10% NaCl, 15% NaOH and rest water. In operation water is evaporated and NaCl is precipitated as crystals. The thick liquor leaving the evaporator contains 45% NaOH, 2% NaCl and rest water. Determine the following data: (a) kg/hr water evaporated (b) kg/h salt precipitated **[05]**

b. What is bypass operation? Explain in detail. **[05]**

Q-5 a. Write note on Ideal gas temperature scale. **[05]**

b. Derive an equation for efficiency of heat efficiency. **[05]**

OR

Q-5 a. Derive the equation of first law of thermodynamics for steady state steady flow process. **[05]**

b. Discuss different steps used to solve energy balance process. **[05]**

Q-6 a. Discuss Langmuir adsorption isotherm in detail. **[05]**

b. Write a detail note on physical adsorption. **[05]**

OR

Q-6 a. Write a detail note on chemical adsorption. **[05]**

b. Discuss the industrial applications of adsorption isotherm. **[05]**

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