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SARDAR PATEL UNIVERSITY
EXTERNAL EXAMINATION
B.SC. INDUSTRIAL CHEMISTRY (V)
(SECOND SEMESTER)

US02CICV21: Process calculations and Mechanical operations
SATURDAY, 30TH March, 2019

Time: 2:00 pm to 5:00 pm

Total Marks: 70

Q-1 Answer the following multiple choice question.

[10]

- The average atmospheric pressure of mercury should be _____ psi.
 - 14.70
 - 17.40
 - 14.17
 - 70.14
- In chemistry, unit of concentration expressed as _____
 - Gm/litre
 - Gm/m
 - Molecular weight/ Valence
 - Gm
- Which of the following is a unit operation?
 - Evaporation
 - Sulfonation
 - Alkylation
 - Oxidation
- How many % of oxygen present in the air?
 - 22
 - 21
 - 2.1
 - 2.2
- Unit of latent heat of vaporization is?
 - kJ/kg.K
 - K/kJ
 - kJ/kg
 - kg/kJ
- Which filters are operated with less than atmosphere pressure?
 - Pressure filters
 - Vacuum filters
 - Both a and b
 - Centrifugal filters
- Which of the following filter medium used for acidic slurry filtration?
 - Rayon
 - Polypropylene
 - Non metallic
 - Metallic
- _____ blades required in the propeller impeller.
 - 1
 - 4
 - 3
 - 2
- For mixing solids with solids which equipment is employed?
 - Agitated tank
 - Kneader
 - Dryer mixer
 - Tumbling mixer
- At which geometric angel the Belt conveyors may be used to elective solids?
 - 30-35
 - 25-30
 - 15-20
 - 5-15

Q-2 Answer any ten of following.

[20]

- Enlist the elements of a process flow diagram.
- Define the terms Normality and Molarity.
- Differentiate between batch process and continuous process.
- Define the following terms:
 - Adiabatic process
 - Adiabatic reaction
- What do you mean by a web bulb in humidification?
- What is standard heat of combustion?
- What is constant rate filtration?
- Enlist types of the clarifying filter.
- What is terminal velocity?
- What is trammel?
- Distinguish between ideal screen and actual screen.
- Enlist the use of ultrafine grinder

(1)

(P.T.O)

- Q-3 a. Discuss the Raoult's law and Henry's law in detail. [05]
b. Write an explanatory note on vapour pressure of solids. [05]
OR
- Q-3 a. Discuss the process flow sheet in detail. [05]
b. Discuss the evaporation and extraction with their overall material balance. [05]
- Q-4 a. Explain in brief latent heat of phase change. [05]
b. Derive the relation between C_p and C_v for ideal gas. [05]
OR
- Q-4 a. Write a short note on orsat analyser. [05]
b. Explain the effect of pressure on heat of reaction. [05]
- Q-5 a. Write a note on filter medium in detail. [05]
b. Write an detail note on electrostatic separator. [05]
OR
- Q-5 Discuss the construction & working of plate and frame filter with advantages & disadvantages. [10]
- Q-6 Write explainer note on Jaw crusher and Roll crusher in detail. [10]
OR
- Q-6 Discuss the construction and mixing operation for the following: [10]
1. Tumbling mixer
2. Muller mill
3. Ribben blender