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Sardar Patel University  
F.Y. B.Sc Industrial Chemistry Vocational, Semester-II  
US02CICV02- Mechanical operations  
29<sup>th</sup> March 2016, Tuesday

Time: 10:30 am to 12:30 pm

Total Marks: 70

**Q1. Answer the following multiple choice questions:**

[10]

- The filter medium used for alkaline slurry is made of \_\_\_\_\_  
a. Nylon      b. Paper      c. Wool      d. None of the above
- The solid deposited on the filter medium after filtration is known as \_\_\_\_\_  
a. Coagulants      b. Filter aid      c. Filtrate      d. Residue
- Filters which operate with less than atmospheric pressure are known as \_\_\_\_\_  
a. Pressure filter      b. Vacuum filter      c. Plate and frame filter      d. None
- The separation of solids from a suspension in a liquid by gravity settling is called \_\_\_\_\_  
a. Sedimentation      b. Filtration      c. Mixing      d. All of the above
- In sedimentation, solids gets settled down because of \_\_\_\_\_  
a. Gravitational force      b. Buoyant Force      c. Charge attraction      d. Both (a) and (b)
- Which of the following is a coagulant \_\_\_\_\_  
a. Diatomaceous earth      b. Iron      c. Alum      d. Titanium di-oxide
- The size reduction machines more commonly reduces the size of solids by \_\_\_\_\_  
a. Compression      b. Impact      c. Cutting      d. All of the above
- Which of the following is a cutting machine?  
a. Knife cutter      b. Jaw crusher      c. Agitated mill      d. Both (a) and (b)
- Practical aims of mixing is to \_\_\_\_\_  
a. To promote a chemical reaction      b. To carry out physical change      c. To produce physical mixtures      d. All of the above
- A substance which is uniform in physical as well as chemical composition is called \_\_\_\_\_  
a. Heterogeneous      b. Homogeneous      c. Heterocyclic      d. None of the above

**Q2. Answer the following short questions (Any ten)**

[20]

- Write down the role of filter aid in filtration.
- Write the factors affecting rate of filtration.
- Explain methods used to add filter aid
- Give the principle of sedimentation
- Differentiate between filter aids and coagulants.
- Write the role of coagulant in sedimentation.
- Write the industrial significance of mixing.
- What do you mean by vortex, give various steps to prevent vortex
- Draw a neat diagram of agitated vessel.
- State and explain Kick's law.
- Give the significance of size reduction in chemical industries.
- Write down Rittinger's law.

Q3. With neat diagram explain construction and working of Plate and frame filter press. [10]

OR

Q3. (a) Explain in detail construction and working of leaf filter. [05]  
(b) Write a note on rotary drum filter. [05]

Q4. Write note on [05]

- i. Gravity settling tank [05]
- ii. Magnetic drum separator

OR

Q4. Write a note on [05]

- i. Electrostatic separator [05]
- ii. Magnetic head pulleys

Q5. Explain in detail types of impeller. [10]

OR

Q5. Write in brief about [10]  
i. Liquid - liquid mixing ii. Gas-liquid mixing

Q6. Differentiate between crushing and grinding [10]

OR

Q6. Write a note on: [05]  
i. Gyratory crusher [05]  
ii. Roll crusher

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