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Exam Seat No: _____

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SARDAR PATEL UNIVERSITY

Bachelor of Science (Semester – V) External Examination – 2025

US05CICH54: Fluid Mechanics & Mechanical Operations

Date: 08th October, 2025

Time: 10:00 AM to 01:00 PM

Day: Wednesday

Total Marks: 70 Marks

Q – 1 Answer the following Multiple-Choice Questions. (All are compulsory)

[10]

1. Fluid which does not offer resistance to flow is known as__ Fluid.
(A) Ideal Fluid (B) Real Fluid
(C) Static Fluid (D) Compressible Fluid
2. The fluid which follows Newton's law of viscosity is called _____.
(A) Non – Newtonian Fluid (B) Newtonian Fluid
(C) Static Fluid (D) Ideal Fluid
3. The material is crushed in a gyratory crusher by the action of _____.
(A) Compression (B) Impact
(C) Attrition (D) Cutting
4. Grizzlies are used for _____.
(A) Screening fine solids (B) Screening large solids
(C) Fine solid (D) Any size solids
5. By using which force in a cyclone separator separation occurs?
(A) Centrifugal force (B) Gravitational force
(C) Pressure (D) Magnetic
6. Thickeners are used in _____ sedimentation processes.
(A) Batch Only (B) Continuous
(C) Semi-Batch (D) Instant
7. Mixing is the process of combining two or more materials to form a _____ mixture.
(A) Heterogeneous (B) Viscous
(C) Homogeneous (D) Mechanical
8. Solid-solid mixing is commonly used in _____ blending.
(A) Gas (B) Powder
(C) Liquid (D) Solution
9. Filter aids are used to:
(A) Improve filtration rate and clarity (B) Improve filtration rate and clarity
(C) Measure pressure (D) Measure pressure
10. Cyclones separate particles based on:
(A) Evaporation (B) Centrifugal force
(C) Filtration (D) Gravity Settling



❖ Answer The Following Long Questions (Any 10 out of 12)

[29]

1. State Bernoulli's equation.
2. Define laminar flow and turbulent flow.
3. Provide examples of both Newtonian and non-Newtonian fluids.
4. Define Rittinger's Law and Kick's Law in the context of size reduction.
5. Differentiate between Black Jaw Crusher and Dodge Jaw Crusher
6. Why is centrifuging not desirable in a ball mill?
7. List the factors affecting the filtration rate in an industrial process.
8. Define Filtration.
9. Why filter aid is added?
10. Explain the concepts of homogeneous and heterogeneous mixing.
11. Define mixing operations.
12. State various types of mixing.



❖ Answer The Following Long Questions

- Q – 2 [A] Write an explanatory note on Newtonian and Non-Newtonian fluids. [05]
[B] Derive the continuity equation and explain its importance in fluid flow. [05]

OR

- Q – 2 [A] Describe the construction and working of a U-tube manometer. [05]
[B] Describe the working, construction and performance of a centrifugal pump. [05]

- Q – 3 [A] Write notes on the construction, working, and use of Gyratory Crusher. [05]
[B] Differentiate between Crushing and Grinding. [05]

OR

- Q – 3 [A] Write notes on the construction, working, and use of Roll Crusher. [05]
[B] Describe the construction and operation of a ball mill used in size reduction. [05]

- Q – 4 [A] Explain the construction, working, and efficiency of Plate and Frame Filters with a labelled diagram. [05]
[B] Define sedimentation. Explain Batch sedimentation test with a neat sketch. [05]

OR

- Q – 4 [A] Describe the construction and operation of Rotary Drum Filters used in solid-liquid separation. [05]
[B] Explain the working of a Froth Flotation Cell with a neat sketch. [05]

- Q – 5 [A] Write a note on the types of equipment used for solid-solid mixing in industries. [05]
[B] Define swirling and vortex formation in mixing. How can vortex formation be minimized? [05]

OR

- Q – 5 [A] Describe the construction, parts, and working of a belt conveyor used in material handling. [05]
[B] Describe Liquid-Liquid Mixing methods with a neat sketch of suitable equipment. [05]

X
(2)