P P SAVANI UNIVERSITY

Third Semester of B. Tech. Examination

May 2019

SECH2020 Solid Fluid Operations

21.05.2019, Tuesday **Time: 09:00 a.m. To 11:30 a.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

Q - 1	**Answer the following: (Any Five)**	**[05]**
(i)	Define: Sphericity.	
(ii)	State the difference between open and closed circuit grinding.	
(iii)	How is solid storage handled in industry?	
(iv)	What is the difference between pneumatic and mechanical conveying?	
(v)	Define: Mesh number.	
(vi)	Define: Screen efficiency	
(vii)	State Bond's law and explain its significance.	
Q - 2 (a)	Explain working of a ball mill with a neat diagram.	**[05]**
Q - 2 (b)	State laws of crushing and grinding.	**[05]**
	OR	
Q - 2 (a)	Explain in detail mechanical classifiers with a neat diagram.	**[05]**
Q - 2 (b)	Explain with a neat diagram, construction & working of grizzlies.	**[05]**
Q - 3 (a)	What is jigging? Draw and explain the construction of a hydraulic jig.	**[05]**
Q - 3 (b)	Calculate the power required to crush 150 tonnes per hour of limestone if 80% of the feed passes 50mm screen and 80% of the product passes a 3.125mm screen? Work index of limestone = 12.74.	**[05]**
	OR	
Q - 3 (a)	Explain with a neat diagram, construction & working of trommels.	**[05]**
Q - 3 (b)	A certain crusher accepts a feed material having a volume-surface mean diameter of 19 mm and gives a product of volume-surface mean diameter of 5 mm. The power required to crush 15 tonnes per hour is 7.5 kW. What will be the power consumption if the capacity is reduced to 12 tonnes per hour?	**[05]**
Q - 4	**Attempt any one.**	**[05]**
(i)	Explain in brief the construction and working of jaw crusher with a neat diagram.	
(ii)	Describe various laws for size reduction and write principle of comminution.	

SECTION – II

Q - 1	**Answer the following: (Any Five)**	**[05]**
(i)	State the uses of filter media.	
(ii)	What is fluidization?	
(iii)	Explain the difference between classifier and clarifier.	
(iv)	What is the purpose of agitation?	
(v)	How can be swirling prevented in an agitator?	
(vi)	Explain the purpose of filter medium.	
(vii)	What is mechanical mixing?	

Q - 2 (a)	Draw a neat diagram and explain construction, working, advantages, limitations and applications of rotary drum filter.	**[05]**
Q - 2 (b)	Describe different mixing equipments used for solid mixing in brief.	**[05]**
	OR	
Q - 2 (a)	With the help of a neat sketch explain the construction and working of a cyclone separator.	**[05]**
Q - 2 (b)	Write short note on batch centrifuge.	**[05]**
Q - 3 (a)	Explain in brief: Ribbon Blender, Muller mixer	**[05]**
Q - 3 (b)	Explain different types of impellers for agitation of liquids with diagram and its application.	**[05]**
	OR	
Q - 3 (a)	What is the principle on which cyclone separator works? Explain its construction with a neat diagram.	**[05]**
Q - 3 (b)	Explain characteristics of filter medium.	**[05]**
Q - 4	**Attempt any one.**	**[05]**
(i)	Explain construction & working of a froth floatation cell with a neat diagram.	
(ii)	Explain in detail with a neat diagram plate and frame filter press.	

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