P P SAVANI UNIVERSITY

Third Semester of B. Tech. Examination

December 2021

SECH2020 MECCAHNICAL OPERATION

10.12.2021, Friday **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 / Define the Following: (Solve any Five)	**[05]**
(i)	Sphericity.	
(ii)	Bulk Density.	
(iii)	Critical Speed of Ball-mill.	
(iv)	Screen Analysis.	
(v)	Capacity and Effectiveness of Screen.	
(vi)	Angle of Repose.	
(vii)	Particle Population.	
Q - 2 (a)	Explain Working of Ball Mill and Gyratory Crusher with Suitable Diagram.	**[05]**
Q - 2 (b)	Explain size reduction Principal also explain any two crushing law.	**[05]**
	OR	
Q - 2 (a)	Explain Principal, Construction and Working of Jaw Crusher.	**[05]**
Q - 2 (b)	In a ball mill of diameter 2000 mm, 100 mm dia steel balls are being used for grinding. Presently, for the material being ground, the mill is run at 15 rpm. At what speed will the mill have to be run if the 100 mm balls are replaced by 50 mm balls, all the other conditions remaining the same?	**[05]**
Q - 3 (a)	Explain Construction and Working of Trommel Screen.	**[05]**
Q - 3 (b)	Explain Construction and Working about Vibrating Screen.	**[05]**
	OR	
Q - 3 (a)	Discuss five parameters affecting efficiency of screening.	**[05]**
Q - 3 (b)	Explain the construction and working of bucket elevator & belt conveyor with neat sketch.	**[05]**
Q - 4	Attempt any two.	**[05]**
(i)	Write Short note on Pneumatic Conveyers.	
(ii)	Write applications of a screw conveyor.	
(iii)	Explain in Details Mesh Number.	

SECTION – II

Q - 1	Enlist different types of flow pattern induced in an Agitated vessel contains liquid.	**[05]**
Q - 2 (a)	How vortex formation can be prevented in agitated vessel.	**[05]**
Q - 2 (b)	Differentiate classifier and clarifier.	**[05]**
	OR	
Q - 2 (a)	Enlist different parameters affecting rate of filtration.	**[05]**
Q - 2 (b)	Explain use of Filter aid and Filter Medium with a suitable example.	**[05]**
Q - 3 (a)	Explain the working of a vacuum drum filter with a neat sketch and specify the ields of application.	**[05]**

Q - 3 (b)	Define agitation and mixing. Enlist different types of flow pattern induced in an Agitated vessel contains liquid.	**[05]**

OR

Q - 3 (a)	Discuss power consumption in agitated vessel with relevant equations.	**[05]**
Q - 3 (b)	Explain: Magnetic separation and Electrostatic Separator.	**[05]**
Q - 4	Attempt any one.	**[05]**
(i)	What is the differential settling method? Explain in detail the working of batch sedimentation with application.	
(ii)	Explain construction and working of the cyclone separator.	

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