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Seat No.	
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[5559]-219

S.E. (II Semester) (Chemical Engineering) EXAMINATION, 2019
MECHANICAL OPERATIONS
(2015 PATTERN)

Time : 2 Hours

Maximum Marks : 50

- N.B. :—**
- (i) Answer Q. Nos. 1 or 2, 3 or 4, 5 or 6, 7 or 8.
 - (ii) Figures to the right indicate full marks.
 - (iii) Neat diagrams must be drawn wherever necessary.
 - (iv) Assume suitable data, if necessary.
 - (v) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables in permitted.

1. (a) What is Mesh No. ? Explain Differential and Cumulative Analysis ? [6]
(b) Explain Mechanism for Sedimentation with neat diagram.[7]

Or

2. (a) Calculate the energy required to crush 100tone/hr of limestone if 80% of the feed passes through a screen 3.75 cm. Aperture and 80% of product passes through a screen with 0.03cm. aperture. The work index for limestone is 12.74, when the capacity is expressed in tones/hr, energy required in HP and size of feed and product in feet. [6]
(b) Explain sedimentation. State the assumptions of Kynch theory of sedimentation. [7]

3. (a) Explain Gravity settling method. [4]
(b) Explain Muller Mixers and Ribbon Blender. Also write short note on Mixing Index. [8]

Or

4. (a) Explain Cyclone separator with neat diagram. [6]

P.T.O.

- (b) A disk turbine with six flat blades is installed centrally in a vertical baffled tank 2m in diameter. The turbine is 0.67m in diameter and is positioned 0.67m above the bottom of the tank. The turbine blades are 134 mm wide. The tank is filled to a depth of 2m with an aqueous solution of 50% NaOH at 65 degree Celsius, which has a viscosity of 12cP and density of 1,500 kg/m³. The turbine impeller turns at 90 rpm. What power will be required ? [6]
Take ($K_T = 5.75$).
5. (a) What is Filtration ? Define filter aid, give name of filter aid and state method of using it. [7]
(b) Enlist the characteristics of Filter media. [6]
- Or*
6. (a) Explain factors affecting on rate of Filtration. [7]
(b) State factors to be considered while selecting filtration equipment. [6]
7. (a) Explain with neat sketch construction, working of Flight Conveyor. [5]
(b) What are various equipments used for storage of solids ? Discuss them with neat diagrams. [7]
- Or*
8. (a) Write a note on Screw Conveyor. [5]
(b) Explain Bucket Elevator and Pneumatic Conveyor with neat diagram. [7]