PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B. Tech Summer 2018 - 19 Examination

Semester: 5   **Date: 17/05/2019**
Subject Code: 03103302   **Time: 10:30am to 1:00 pm**
Subject Name: Mechanical Operations   **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1   Objective Type Questions -   **(15)**
　　　　1. Driving force of sedimentation is _____
　　　　2. Write an expression for Reynolds Number(Re_N) in mixing of fluids
　　　　3 Driving force in Filtration _____
　　　　4. Hydro-clone is used for the separation of _____ mixture
　　　　5.If Froude number is greater than ONE _____ type of fluidization occurs
　　　　6.Sphericity for a cylinder whose length is not equal to its diameter is_____
　　　　7.For a gyratory crusher, efficiency is _____ and capacity is _____
　　　　8.Number of aperture per unit length is called _____
　　　　9.Write down the expression of Rittenger's law for size reduction
　　　　10. A Static Mixer is used for _____
　　　　11. Full form of PSD is _____
　　　　12. Most commonly used Filter Aid in the industry is _____
　　　　13. Sphericity is ratio of _____
　　　　14. _____Mixer used for mixing of cohesive solids
　　　　15. Cyclone is used for the separation of _____

Q.2   Answer the following questions. (Attempt any three)   **(15)**
　　　　A)Explain different types of filter Media used in the chemical industry.
　　　　B)Explain three Theories(law) for Size reduction with mathematical expressions.
　　　　C)Explain the working of jaw Crusher with diagram.
　　　　D) Explain the working of Cyclones with diagram.

Q.3   A) Derive an expression for critical speed of ball mill.   **(07)**
　　　　B) Briefly describe about the size reduction equipment.   **(08)**

OR

　　　　B) Derive an Expression for Power requirement in Agitation.   **(08)**

Q.4   A) Define Fluidization and Explain Different conditions of Fluidization with diagram   **(07)**

OR

　　　　A) A quartz mixture having a certain screen analysis is screened through A standard 10 mesh   **(07)**
　　　　screen. Calculate (a) the mass ratio of overflow and underflow to feed and (b) the
　　　　effectiveness of the screen. Due to blinding an appreciable fraction of the screen surface
　　　　become inactive. The blinding tendency is more pronounced with fine screens than coarse
　　　　screen.
　　　　$D_p = D_{pc} = 1.651$ mm , $X_F = 0.47$, $X_D = 0.85$, $X_B = 0.195$
　　　　B) Discuss different screening equipment used chemical industry.   **(08)**