

Unit 8 - Week 6

Course outline
How to access the portal?
Week 0 Assignment 0
week 1
Week 2
Week 3
Week 4
Week 5
Week 6
<input checked="" type="radio"/> Lecture 26 : Sedimentation
<input checked="" type="radio"/> Lecture 27 : Sedimentation (Contd.)
<input type="radio"/> Lecture 28 : Sedimentation (Contd.)
<input checked="" type="radio"/> Lecture 29 : Sedimentation (Contd.)
<input checked="" type="radio"/> Lecture 30 : Sedimentation (Contd.)
<input type="radio"/> Lecture Materials
<input type="radio"/> Quiz : Assignment 6
<input type="radio"/> Feedback for week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
DOWNLOAD VIDEOS
Details Solution
Live Session

Assignment 6

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-09-11, 23:59 IST.

- 1) In hindered settling process, if $U_T =$ single particle terminal velocity and the drag is independent of fluid density, then the particle settling velocity is __ 1 point
- $U_T \varepsilon^{0.4}$
 - $U_T \varepsilon^{2.4}$
 - $U_T \varepsilon^{2.65}$
 - $U_T \varepsilon^{4.65}$
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
d.
- 2) In hindered settling process, if $U_T =$ single particle terminal velocity and the drag is independent of fluid viscosity, then the particle settling velocity is __ 1 point
- $U_T \varepsilon^{0.4}$
 - $U_T \varepsilon^{2.4}$
 - $U_T \varepsilon^{2.65}$
 - $U_T \varepsilon^{4.65}$
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b.
- 3) The sedimentation velocity of particles usually _____ with increasing suspension concentration. 1 point
- increases
 - decreases
 - remains unaffected
- a.
 b.
 c.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b.
- 4) Sedimentation in a suspension exhibiting non-Newtonian behavior, the sedimentation rate is influenced by: 1 point
- temperature
 - degree of agitation
 - both (a) and (b)
 - none of the above
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c.
- 5) In the batch settling flux plot, the slope of a chord joining two concentration points provides __ 1 point
- the concentration of suspension
 - the velocity of an interface
 - the height of an interface
 - the concentration of sediment
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b.
- 6) In the batch settling flux plot, the gradient of the curve at a concentration provides __ 1 point
- the height of an interface that concentrated layer
 - the velocity of that concentrated layer
 - the acceleration of an interface
 - the concentration of sediment
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b.
- 7) The height of suspension generally influences the rate of sedimentation. 1 point
- True
 - False
- a.
 b.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b.
- 8) In general, sedimentation rate in a suspension can be enhanced by: 1 point
- decreasing particle size
 - increasing suspension viscosity
 - increasing difference between particle and liquid density
 - decreasing suspension initial height
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c.
- 9) In an underloaded thickener, the concentration in the top section of the thickener is: 1 point
- greater than the feed concentration
 - lesser than the feed concentration
 - equal to the feed concentration
 - equal to zero
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
d.
- 10) In a critically loaded thickener, the concentration in the top section of the thickener is: 1 point
- equal to zero
 - equal to the concentration in downflow section
 - can be both (a) and (b)
 - None of the above
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c.
- 11) To get a clarified liquid in a thickener, which of the following is correct? 1 point
- Liquid upward velocity > particle settling velocity
 - Liquid upward velocity = particle settling velocity
 - Liquid upward velocity < particle settling velocity
 - None of the above
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c.
- 12) Calculate the settling velocity of glass spheres having a diameter of 155 microns in water ($\rho = 1000 \text{ kg/m}^3$ and $\mu = 0.001 \text{ Pa.s}$) with solid wall effect at 293 K and $C_D = 17.85$. The slurry contains 60 wt% of solids. The density of the glass spheres is 2467 kg/m^3 ? 3 points
- 0.24 mm/s
 - 1.5 mm/s
 - 1.8 mm/s
 - 0.30 mm/s
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c.
- 13) A suspension in water of uniformly sized spheres of diameter 100 μm and density 1200 kg/m^3 has a solids volume fraction of 0.2. The suspension settles to a bed of solids volume fraction 0.5. (For water: density, 1000 kg/m^3 and viscosity, 0.001 Pa.s) The single particle terminal velocity of the spheres in water may be taken as 1.1 mm/s . Calculate the velocity at which the clear water/suspension interface settles. 3 points
- 0.39 m/s
 - 0.39 mm/s
 - 0.78 m/s
 - 0.78 mm/s
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b.
- 14) Spherical particles of uniform diameter, 40 μm , and particle density 2000 kg/m^3 form a suspension of solids volume fraction 0.32 in a liquid of density 880 kg/m^3 and viscosity 0.0008 Pa.s . Assuming Stokes' Law applies; calculate the sedimentation velocity and the sedimentation volumetric flux for this suspension. 3 points
- 0.203 mm/s , 0.065 mm³/mm²
 - 0.406 mm/s , 0.130 mm³/mm²
 - 0.203 m/s , 0.065 mm³/mm²
 - 0.203 mm/s , 0.130 mm³/mm²
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
a.