

Unit 5 - Week 3: Cell breakage and Solid-Liquid Separation

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Assignment 3

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

Due on 2019-08-21, 23:59 IST.

1) In a bead mill 50% of the intracellular enzymes are released in 5 hours. How long will it take to release 75% of them (assume first order release process)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 9.95,10.05

1 point

2) Protein deactivation as a function of temperature follows a first order kinetics with activation energy of 1.5 Kcals/mol. The protein release from inside the cells rate constant follows an Arrhenius relation such as the constant term is = 0.2. If the temperature is $60^{\circ}C$, what is the release rate constant at this temperature?

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.0195,0.021

1 point

3) You are operating a homogeniser at an upstream pressure of 300 bar. You connect another homogeniser of same capacity in parallel to it and the upstream pressure now is 200 bar. What is the increase in capacity in % after adding this unit (assume other parameters to be the same and capacity is proportional to upstream pressure)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 32,34

1 point

4) Two lipases (A and B initially at equal concentrations) deactivate with deactivation rate constants of k and 2k respectively. What will be the relationship between the concentrations (C_A and C_B) of these two lipases?

$C_A^2 = C_B$

$C_B^2 = C_A$

$C_A = C_B$

$C_A = 1/C_B$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $C_A^2 = C_B$

1 point

5) Solids A and B have compressibility factors of 0.5 and 0.7 respectively but the ease of filtration is the same in both the cases at the same pressure. If the pressure of filtration is doubled which one will filter faster?

- No change
- B
- A
- Both

No, the answer is incorrect.
Score: 0

Accepted Answers:
A

6) It takes 60 minutes to filter a slurry of 1000 litres using a filter of $2 m^2$ area and pressure of 10 bar. How long will it take to filter $10 m^3$ of same slurry with a filter of area $5 m^2$ and 20 bar pressure? Assume incompressible cake and Resistance offered by cloth is zero

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 478,482

1 point

7) A particle twice the size of the original particle will settle

- Two times faster
- Four times faster
- Two times slower
- Four times slower

No, the answer is incorrect.
Score: 0

Accepted Answers:
Four times faster

1 point

8) If I use a bowl centrifuge to separate the solids from slurry, the throughput of the centrifuge for 2 cm diameter particles when compared to 1 cm diameter particles will be

- go up by factor of 4
- go down by a factor of 4
- go up by a factor of 2
- go down by a factor of 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
go up by factor of 4

9) A particle moving at a velocity of 4 cm/s has a Reynold's number of 4. If it is broken into half, what will be the Reynold' number

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 1.99,2.01

1 point

10)In order to measure the pressure drop through packed bed we can use

- Newton's law
- Darcy's Law
- Law of Settling
- Stoke's Law

No, the answer is incorrect.
Score: 0

Accepted Answers:
Darcy's Law

1 point