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Courses » Bioreactors

Announcements

Course

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Unit 6 - week 4

Register for Certification exam

Course outline

How to access the portal

Week 0

week 1

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week 4

- lecture 17 - shear stress, scale-up, scale-down
- lecture 18 - cell view: stoichiometry; degree of reductance
- lecture 19 - solution to PP 5.1
- lecture 20 - culture status, metabolic flux analysis
- lecture 21 - course summary

○ Quiz :

Assignment 4

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-02-27, 23:59 IS**

1) Identify the factors resulting in shear stress in a bioreactor:

1 point

- Aeration
- Agitation
- Toxic by-products
- pH change

No, the answer is incorrect.

Score: 0

Accepted Answers:

Aeration

Agitation

2) Find the degree of reduction of Sucrose: $C_{12}H_{22}O_{11}$

1 point

- 4
- 6
- 8
- 10

No, the answer is incorrect.

Score: 0

Accepted Answers:

4

3) Cellular redox status is defined as:

1 point

- $\frac{NADH}{NAD^+ + NADH}$
- $\frac{NAD^+}{NAD^+ + NADH}$

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No, the answer is incorrect.**Score: 0****Accepted Answers:**

$$\frac{NADH}{NAD^+ + NADH}$$

4) Which of the following is a geometric parameter useful in scale up? **1 point**

- Impeller tip speed
- Volumetric mass transfer coefficient
- Ratio of length of impeller blade to impeller diameter
- Medium composition

No, the answer is incorrect.**Score: 0****Accepted Answers:***Ratio of length of impeller blade to impeller diameter*5) In the equation, $\vec{S} \cdot \vec{r} = d\vec{x}/dt$, identify \vec{S} , \vec{r} and \vec{x} **1 point**

- S- State vector, r- Stoichiometric matrix, x- rate vector
- S- State vector, r- rate vector , x- Stoichiometric matrix
- S- Stoichiometric matrix, r- State vector , x- rate vector
- S- Stoichiometric matrix, r- rate vector , x- state vector

No, the answer is incorrect.**Score: 0****Accepted Answers:***S- Stoichiometric matrix, r- rate vector , x- state vector*6) Scale down is carried out to: **1 point**

- Study the potential strategies to improve an existing process
- Test modified production strains
- Validate new operating procedures
- Test the feasibility on a large scale.

No, the answer is incorrect.**Score: 0****Accepted Answers:***Study the potential strategies to improve an existing process**Test modified production strains**Validate new operating procedures*7) Consider the production of single cell protein from hexa-decane by the following reaction **1 point**
equation:

Determine the biomass yield coefficient: Choose the answer closest to your calculated answer.

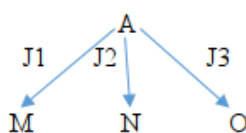
- 0.86 g/g
- 0.97 g/g
- 0.56g/g
- 0.69g/g

No, the answer is incorrect.**Score: 0****Accepted Answers:**

0.97 g/g

8) Write the split ratio for the desired product 'O' in the pathway shown below:

1 point



- $\frac{J3}{J1+J2}$
- $\frac{J1+J2}{J3}$
- $\frac{J3}{J1+J2+J3}$
- $\frac{J1+J2+J3}{J3}$

No, the answer is incorrect.

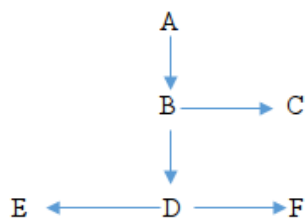
Score: 0

Accepted Answers:

$\frac{J3}{J1+J2+J3}$

9) Consider the pathway shown below:

1 point



The product of interest here is E. It was observed that knocking out the enzyme producing C improved the production of E and its precursor D. But when the enzyme producing F was knocked out, the production of D halved and E was not produced. Which of the following is true about the above pathway?

- B is a rigid node
- E is a rigid node
- D is a rigid node
- D is a flexible node

No, the answer is incorrect.

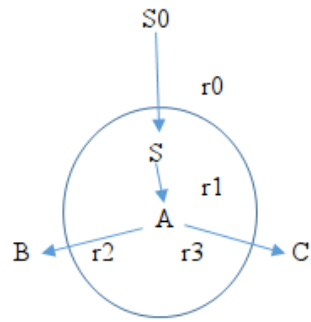
Score: 0

Accepted Answers:

D is a rigid node

10) Choose the correct stoichiometric matrix from below for the reaction shown:

0 points



```
-1 0 0 0
1 -1 0 0
0 1 -1 -1
0 1 0 0
0 0 1 0
```



```
-1 0 0 0
1 0 0 0
0 1 -1 -1
0 0 0 0
0 0 1 0
```



```
-1 0 0 0
1 -1 0 0
0 1 0 0
0 1 0 0
0 0 0 0
```



```
0 0 0 0
0 -1 0 0
0 1 -1 -1
0 1 0 0
0 0 1 0
```

No, the answer is incorrect.

Score: 0

Accepted Answers:

```
-1 0 0 0
1 -1 0 0
0 1 -1 -1
0 1 0 0
0 0 1 0
```



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