Unit 8 - Week 5

Assignment 5

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

Due on 2020-03-04, 23:59 IST.

1) The reaction rate for the chemical equation $A + 2B \rightleftharpoons C$ is given by: *1 point*

- $2K_+[A][B] + K_-[C]$
- $2K_+[A][B] - K_-[C]$
- $K_+[A][B]^2 + K_-[C]$
- $K_+[A][B]^2 - K_-[C]$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$K_+[A][B]^2 - K_-[C]$

Given the following table showing the values for Y for different values of X. Two different sets of parameters, Param 1 and Param 2 are used to predict the values of Y

X	$Y_{measured}$	$Y_{predicted}$ (Param 1)	$Y_{predicted}$ (Param 2)
10	2	2.5	2
20	7	6	6
30	10	12	11.5
40	17	17	16.5
50	25	25.5	26.1

2) The best parameter set for describing this model is ____. *1 point*

- Param 1
- Param 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
Param 2

3) The least square error (unweighted) is ____. (enter upto 4 decimal places)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.045,0.046

2 points

4) Which of the options best matches the following types of problems with the preferred method of parameter estimation? *1 point*

I.Linear function
II.Quadratic function
III.Multimodal non-linear function

i.Direct search methods
ii.Regression
iii.Gradient-based search methods

- I-(ii), II-(iii), III-(i)
- I-(iii), II-(i), III-(ii)
- I-(iii), II-(ii), III-(i)

No, the answer is incorrect.
Score: 0

Accepted Answers:
I-(ii), II-(iii), III-(i)

5) A model is _____ if its parameters can be uniquely estimated. *1 point*

- Stable
- Identifiable
- Unique

No, the answer is incorrect.
Score: 0

Accepted Answers:
Identifiable

6) Determine the stoichiometric matrix for the following set of reactions: *0 points*

R1: A + 2B --> C
R2: C --> D + 2E

- $\begin{bmatrix} -1 & 0 \\ -2 & 0 \\ -1 & 1 \\ 0 & 1 \\ 0 & 2 \end{bmatrix}$
- $\begin{bmatrix} -1 & -1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 2 \end{bmatrix}$
- $\begin{bmatrix} 1 & 0 \\ 2 & 0 \\ 1 & -1 \\ 0 & -1 \\ 0 & -2 \end{bmatrix}$
- $\begin{bmatrix} 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & -1 & -1 & -2 \end{bmatrix}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\begin{bmatrix} -1 & 0 \\ -2 & 0 \\ -1 & 1 \\ 0 & 1 \\ 0 & 2 \end{bmatrix}$

Minimize the function $f(x,y) = (x-3)^4 + (x-3)^2y + (1+y)^2$ using the MATLAB command fminsearch starting at $(x_0,y_0) = (1,1)$. The minimum point is at (x*, y*)

7) Enter the minimum value of f(x,y) upto 4 decimal places.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) -0.34,-0.3

2 points

8) Enter x* upto 4 decimal places:

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 2.1,2.2

0.5 points

9) Enter y* upto 4 decimal places:

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) -1.34,-1.3

0.5 points