Unit 7 - Week 5

Assignment 05

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) Consider the below SFD where, In=10 units/ time, R1=S1/5, R2=S2/10, R3=S3/5.
Suppose the system is in steady state or equilibrium state.

From the data given above answer Q1, Q2 and Q3.

At steady state, the values of stocks, S1 = _____

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 50

1 point

2) At steady state, the values of stocks, S2 = _____

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 100

1 point

3) At steady state, the values of stocks, S3 = _____

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 50

1 point

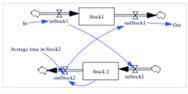
4) The material delay with the least variability around the average delay time is: *1 point*

- 1st order exponential delay
- 3rd order exponential delay
- 12th order exponential delay
- pipeline delay

No, the answer is incorrect.
Score: 0

Accepted Answers:
pipeline delay

5) Consider the SFD shown on the right, in which, *2 points*
inStock2 = inStock1 = In
Out = outStock1 = OutStock2
OutStock2 = Stock2/ Average time in Stock 2.
What does the structure correspond to?

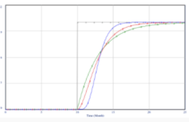


- A negative feedback loop with delay
- First order material delay
- Generic structure for oscillations
- Second order material delay

No, the answer is incorrect.
Score: 0

Accepted Answers:
First order material delay

6) Consider the following output (outflow) of the material delay, in response to a step increase in input at time 10. Match the pattern shown in the graph with the possible type of material delay. *1 point*



- 1-First order delay; 2-Second order delay; 3-Sixth order delay
- 1-First order delay; 3-Second order delay; 2-Sixth order delay
- 3-First order delay; 2-Second order delay; 1-Sixth order delay
- 3-First order delay; 1-Second order delay; 2-Sixth order delay

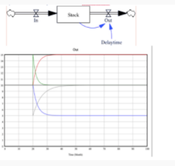
No, the answer is incorrect.
Score: 0

Accepted Answers:
3-First order delay; 2-Second order delay; 1-Sixth order delay

7) Consider a first-order delay as shown in the figure below, with a delay time of 3 months. Inflow is constant at 10 units/month. Initial value of Stock is 30 units. *2 points*

Outflow, Out = Stock/ Delaytime.
Suppose the Delaytime increases from 3 months to 5 months in month 20.

From the possible behaviours of the outflow Out shown in graph below, choose the correct behaviour of Out in response to a step increase in Delaytime from 3 to 5 in month 20.



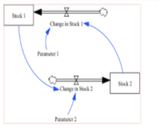
- Red line
- Green line
- Grey Line
- Blue Line

No, the answer is incorrect.
Score: 0

Accepted Answers:
Grey Line

8) Consider the SFD shown. *1 point*

Initial value of Stock1 = Initial value of Stock2 = +1. Also,
Change in Stock 1 = Stock 2 * Parameter1
Change in Stock 2 = Stock 1 * Parameter2



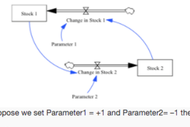
Suppose we set *Parameter1* = −1 and *Parameter2*= −1 then the resulting behaviour will be:

- Exponential growth/ collapse
- Goal seeking
- Oscillations
- S-shaped growth

No, the answer is incorrect.
Score: 0

Accepted Answers:
Goal seeking

9) Consider the SFD shown. *1 point*
Initial value of Stock1 = Initial value of Stock2 = +1. Also,
Change in Stock 1 = Stock 2 * Parameter1
Change in Stock 2 = Stock 1 * Parameter2



Suppose we set Parameter1 = +1 and Parameter2= −1 then the resulting behaviour will be:

- Exponential growth/ collapse
- Goal seeking
- Oscillations
- S-shaped growth

No, the answer is incorrect.
Score: 0

Accepted Answers:
Oscillations