Quizzes of TTK4225 - Systems Theory, Autumn 2020

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Question 38

Which of the following ingredients are needed to define the model of a state-space dynamical system?

(a) state variables   (b) structure of the state update function

(c) parameters of the state update function   (d) initial condition

1. only a
2. only a and b
3. only a, b and c
4. all of them
5. I do not know

Question 39

Which of the following ingredients are needed to simulate a state-space dynamical system?

(a) state variables   (b) structure of the state update function

(c) parameters of the state update function   (d) initial condition

1. only a
2. only a and b
3. only a, b and c
4. all of them
5. I do not know

Question 40

Which of the following ingredients characterize a state-space dynamical model?

(a) a finite set of state variables   (b) an infinite set of state variables
(c) first order differential equations   (d) generic order differential equations

1. a and c
2. a and d
3. b and c
4. b and d
5. I do not know

Question 41

Consider the system $\dot{y} = -0.5y + 2.3u$, $y_0 = 1$, and $|u(t)| \leq 2$ for every t. Assume moreover that from $t = 10$, $u(t) = 0$. Then we are sure that $y(t) \approx 0$ at the earliest starting from ...

1. $t = 10$
2. $t = 20$
3. $t = 30$
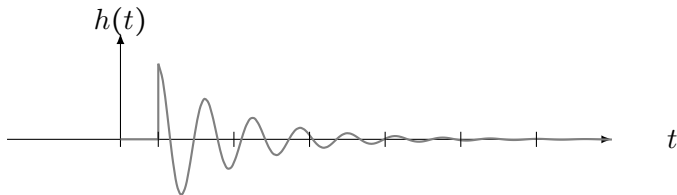4. $t = 40$
5. none of the above
6. I do not know

Question 42

Consider the system $\dot{y} = -0.5y + 2.3u$. Assume moreover that from $t = 10$, $u(t) = 0$.
Then we are sure that $y(t) \approx 0$ at the earliest starting from . . .

1. $t = 10$
2. $t = 20$
3. $t = 30$
4. $t = 40$
5. none of the above
6. I do not know

Question 43

Consider the impulse response $h(t)$ given by

Assume that for $t < 0$ the system is in its equilibrium, i.e., $y(t < 0) = 0$ and $u(t < 0) = 0$. Assume moreover $u(t) = \delta(t - 10)$. Then ...

1. $y(10.0001) < 0$
2. $y(10.0001) = 0$
3. $y(10.0001) > 0$
4. I do not know