Control Systems Questions and Answers – Linear Approximation of the Non-Linear System

This set of Control Systems Multiple Choice Questions & Answers (MCQs) focuses on "Linear Approximation of the Nonlinear System".

1. Due to which of the following reasons excessive band width in control systems should be avoided?
a) It leads to slow speed of response
b) It leads to low relative stability
c) Noise is proportional to bandwidth
d) Presence of feedback

View Answer

Answer: c
Explanation: Excessive Bandwidth causes increases in the noise with the same proportion as the bandwidth and hence noise is not good for any signal therefore the excessive bandwidth is not desirable.

2. In a stable control system backlash can cause which of the following?
a) Underdamping
b) Overdamping
c) Poor stability at reduced values of open loop gain
d) Low-level oscillations

View Answer

Answer: d
Explanation: In stable control systems backlash is the form of the error which may cause low level of the oscillations and hence can be useful sometimes as it increases the damping.

3. In an automatic control system which of the following elements is not used?
a) Error detector
b) Final control element
c) Sensor
d) Oscillator

View Answer

Answer: d
Explanation: In an automatic control system oscillator is not used because the oscillator increases the oscillations but our aim is to reduce the oscillations and hence oscillator is not used.

4. In a control system the output of the controller is given to
a) Final control element
b) Amplifie
c) Comparator
d) Sensor

View Answer

Answer: a
Explanation: In control system the output of the controller is given to the final control element it may be the plant or any other controller which-ever is used in the control circuit.

5. A controller, essentially, is a
a) Sensor
b) Clipper
c) Comparator
d) Amplifier

View Answer

Answer: c
Explanation: A controller is essentially the comparator which compares the given input with the reference input and generates the error signal.

6. Which of the following is the input to a controller?
a) Servo signal
b) Desired variable value
c) Error signal
d) Sensed signal

View Answer

Answer: c
Explanation: Error signal is the input to the controller and it causes the output to be the desired output.

7. The on-off controller is a _____ system.
a) Digital
b) Linear
c) Non-linear
d) Discontinuous

View Answer

Answer: d
Explanation: The on-off controller is discontinuous at the point when the system changes its state from on to off.

8. The capacitance, in force-current analogy, is analogous to
a) Momentum
b) Velocity
c) Displacement
d) Mass

View Answer

Answer: d
Explanation: The capacitance in the force current is analogous to the mass and this analogy is also called parallel analogy as mostly all the elements are parallel.

9. The temperature, under thermal and electrical system analogy, is considered analogous to
a) Voltage
b) Current
c) Capacitance
d) Charge

View Answer

Answer: a
Explanation: The temperature under thermal and electrical system analogy is considered analogous to the voltage and is similar to the Force voltage analogy.

10. In electrical-pneumatic system analogy the current is considered analogous to
a) Velocity
b) Pressure
c) Air flow
d) Air flow rate

View Answer

Answer: d
Explanation: In electrical-pneumatic system analogy the current is analogous to the air-flow rate.

11. The use of feedback element in the feedback loop is:
a) It converts the output variable 'c' to another suitable feedback variable 'b' to compare with the input command signal.
b) It is the actuating element
c) To increase the stability
d) None of the mentioned

View Answer

Answer: a
Explanation: The feedback can be positive and negative and so applied is to produce the error signal so as to get the desired output.

12. The major components of a controller are:
a) Control element
b) Error detector and control element
c) Feedback element
d) Error detector and feedback element

View Answer

Answer: b
Explanation: Controller is the extra block used in the system to get the desired characteristics and consists of two major components as the error detector and control element in the forward path.

13. Practically all the elements are:
a) Linear
b) Non-linear
c) Exponential
d) None of the mentioned

View Answer

Answer: b
Explanation: It is not practically possible to achieve linear elements as there is some error present so practically all the elements present are non-linear but can be made linear only to some extent.

14. The need of assuming non-linear element as linear:
a) Simplicity of analysis and accuracy of results
b) Ease of calculations
c) Less time consuming
d) Mathematical tool available

View Answer

Answer: d
Explanation: All the mathematical tools are available as per ideal cases so it is necessary to make assumptions for non-ideal to be nearly ideal and hence do the necessary calculations as needed.

15. A non-linear element can be treated as the linear element.
a) True
b) False

View Answer

Answer: a
Explanation: It is possible to make non-linear elements linear to make necessary calculations as practically non-linear elements are present and we make certain assumptions to make them linear.

Sanfoundry Global Education & Learning Series – Control Systems.
To practice all areas of Control Systems, here is complete set of 1000+ Multiple Choice Questions and Answers.

Participate in the Sanfoundry Certification contest to get free Certificate of Merit. Join our social networks below and stay updated with latest contests, videos, internships and jobs!

Youtube | Linkedin | Instagram | Facebook | Twitter | Pinterest

« Prev - Control Systems Questions and Answers – Linearizing Effect and Regenerative Feedback
» Next - Control Systems Questions and Answers – Controller Components – I

Recommended Posts:

1. C Programming Examples on Combinatorial Problems & Algorithms
2. C Programming Examples on Arrays
3. Finite Element Method Questions and Answers
4. Neural Networks Questions and Answers
5. Python Programming Examples on Linked Lists
6. C# Programming Examples on Arrays
7. Digital Communications Questions and Answers
8. Electronic Devices and Circuits Questions and Answers
9. C# Programming Examples on Sorting
10. C# Programming Examples on Matrix
11. Mechatronics Questions and Answers
12. C Programming Examples on Searching and Sorting
13. Digital Signal Processing Questions and Answers
14. Python Programming Examples on Searching and Sorting
15. MATLAB Questions and Answers
16. Instrumentation Transducers Questions and Answers
17. Power Systems Questions and Answers
18. Signals & Systems Questions and Answers
19. Linear Integrated Circuits Questions and Answers
20. Control Systems Questions and Answers

Manish Bhojasia, a technology veteran with 20+ years @ Cisco & Wipro, is Founder and CTO at Sanfoundry. He is Linux Kernel Developer & SAN Architect and is passionate about competency developments in these areas. He lives in Bangalore and delivers focused training sessions to IT professionals in Linux Kernel, Linux Debugging, Linux Device Drivers, Linux Networking, Linux Storage, Advanced C Programming, SAN Storage Technologies, SCSI Internals & Storage Protocols such as iSCSI & Fiber Channel. Stay connected with him @ LinkedIn | Instagram | Facebook | Twitter

Subscribe Sanfoundry Newsletter and Posts

Name*

Email*

Subscribe

Disturbance Signal Effect
Linearizing Effect
Control System & Components
Nonlinear Systems
Controller Components-1
Controller Components-2
Stepper Motors
Hydraulic Systems
Pneumatic Systems
Control System Classification
Time Response Analysis & Design Specifications
Standard Signals Test
First Order Systems
Second Order Systems-1
Second Order Systems-2
Second Order Systems-3
Second Order Systems-4
Steady-State Errors
Zero System Effect - 1
Zero System Effect - 2
Higher-Order Systems
Performance Indices
Robotic Control System-1
Robotic Control System-2
State Variable Analysis-1
State Variable Analysis-2
Lower Order Systems
Stability & Algebraic Criteria
Root Locus Technique
Frequency Response Analysis
Frequency Domain Stability
Design
Digital Control Systems
State Variable Analysis & Design
Liapunov's Stability Analysis
Optimal Control Systems
Nonlinear Systems
Advances in Control System
Error Analysis
Best Reference Books