(a) <u>True or false:</u>

1- Increasing P-control gain reduces stability. (True)
لاحظ العادي انه بيزود الاستقراريه – لكن لو زاد عن حده بيقلل الاستقراريه
2- Adding integral control makes the system more stable. [False]
   - Integral remove steady state error.
3- When we choose a manipulated variable, we choose the ones that has high effect on the output. [True]
4- For temperature control, among P, PI and PID controllers, PID is the most common. [True]

(a) **<u>True or false:</u>**

1) To formulate a model involving liquid level, we should employ energy balance. [false]
   - Temperature Not Liquid
2) In servo control, the main objective is to track the set-point. [True]
   - Servo → set point
   - Regulatory →reject disturbance
3) With the aid of linearization, we can obtain a transfer function of nonlinear systems. [True]
4) Integrating processes are self-regulating. [False]
5) Recycle structure increases both the gain and time constant of the system. [False]
6) Integral action is referred to as "the predictive mode". [False]
   - Integral → presistent
   - Derivative → predictive

(a) <u>True or false:</u>

1. **To formulate a model involving temperature, we employ energy balance.**
   T
2. **Proportional control, generally, removes steady state error (offset).**
   X
3. **Processes with time delay are easy to control.** **X**
4. **A transfer function zero always result in undershoot in the response.**
   X
5. **Too much integral action may cause the system to become unstable.**
   T
6. **Proportional-derivative control is not suitable for noisy signals.** **T**

(a) <u>True or false:</u>

1- Non-self-regulatory processes must be put under feedback control. [True]
2- The higher the time constant, the faster is the process. [False]
3- Controller bias signal is the controller output when the error is non-zero. [False]
4- A system is stable if all bounded inputs result in bounded outputs. [True]
5- To choose manipulated variables, the variables which have low effect on the output should be chosen. [False]
6- Parallel structures result from more than one causal path, with different time constants, between the input and output. [True]
7- The integral mode can be called "the predictive mode". [False]
8- Proportional control is sufficient for level control processes. [True]

(a) True or False:

1. To formulate a mathematical model involving temperature, we should employ energy balance. [True]
2. First-order processes are self-regulating while integrating processes is not. [True]
3. Processes with time delay are easier to control. [False]
4. The zero in a transfer function may result from the existence of more than one causal path, with different time constants, between input and output. [True]
5. The larger is the proportional gain the more stable is the system. [True]

لاحظ هنا لو الزيادة زادت عن حدها بيؤثر سلبا علي الإستقراريه

6. Integral control is used to eliminate steady-state offset. [True]
7. Proportional control is sufficient for level control processes. [True]
8. Ziegler-Nichols's first method can be used to design PID controller for a process with a transfer function G(s) = 1/[s(s+1)]. [False]

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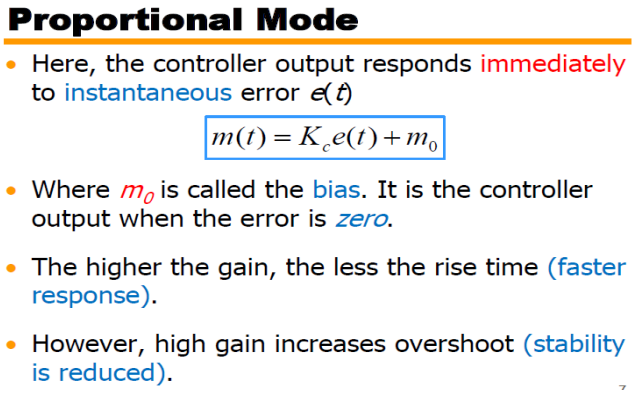
9. The frequency response determines the response of the system to sinusoidal inputs. [True]
10. In cascade control, the sensor for the primary variable should provide good accuracy. [True]

(a) True or false:

1- Non-self-regulatory processes must be put under feedback control. [True]
2- The higher the time constant, the faster is the process. [False]

- High time constant mean that it takes more time so it is not fast

3- Controller bias signal is the controller output when the error is non-zero. [False]



4- A system is stable if all bounded inputs result in bounded outputs. [True]

5- To choose manipulated variables, the variables which have low effect on the output should be chosen. [False]

6- Parallel structures result from more than one causal path, with different time constants, between the input and output. [True]

7- The integral mode can be called "the predictive mode". [False]

- Integral → persistent
- Derivative → predictive

8- Proportional control is sufficient for level control processes. [True]

(a) <u>True or false:</u>

1- The larger the time delay in a control loop, the less stable it becomes. [True]

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2- Proportional derivative (PD) control is suitable for noisy signals. [False]

3- Proportional integral (PI) control is the most common in flow processes. [True]

4- Proportional control is sufficient for level control. [True]

5- For sluggish processes, adding integral control makes them more sluggish. [True]

- Sluggish mean Low speed

6- Integral control is used to eliminate offset. [True]