

Mid-Term Examination (11.6.2021)
Subject: Process Dynamics and Control
B.E. (Chemical)- 6th Semester

Max. Marks: 25
Time allowed: 1 hr

1. a) Derive the transfer function for a purely capacitive process.
- b) Explain: Why two interacting capacities have more sluggish response than two equivalent but non-interacting capacities?
- c) Discuss some of the factors that you should take into account before deciding whether to use an air-to-close or air-to-open pneumatic control valve.

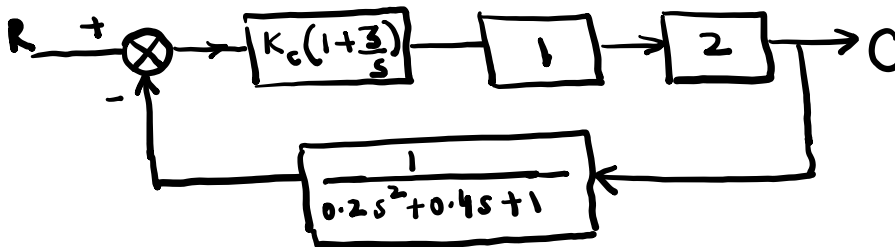
(4*3=12)

2. a) A step change of magnitude 3 is introduced into a system having the transfer function:

$$\frac{Y(s)}{X(s)} = \frac{10}{2s^2 + 0.3s + 0.5}$$

Determine the overshoot and the frequency of oscillation.

- b) By means of the Routh test, determine the stability of the system shown in figure below, when $K_c=2$:



(6,7)