EE6203 HW2 ASSIGNMENT

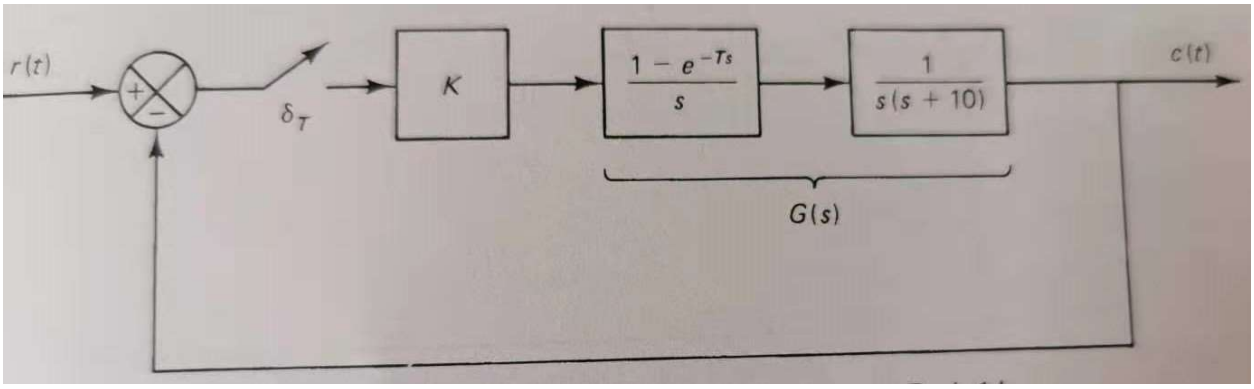
By Prof Wen Changyun

Instructions :

- Solutions in PDF format only must be uploaded to NTULearn EE6203 "Assignments" folder by **9 November 21 TUESDAY 8.00 am.**
- All detailed workings are to be shown as marks will be awarded accordingly.
- Only hand-written solutions are accepted. Typed solutions will not be accepted.
- Write your name clearly on every page of your solutions submitted.
- Scan your work with a mobile phone/tablet scanner apps. Combined all into ONE pdf file to be submitted.
- Please name the file to be submitted with your matriculated FULL NAME.
- Ensure all drawings/diagrams are clear and readable before submitting.
- Submission through email is NOT acceptable.
- Zero marks will be given to a student who did not submit the assignment by the due date/time
- There is one question with four parts in this HW2. Answer all parts of the question.

Question 1

Consider the discrete-time control system with a proportional controller *K* as shown in the following figure. The sampling period *T* is 0.1 second.



(1) Determine the pulse transfer function of the closed-loop system. (25 marks)

(2) Determine the range of gain *K* for stability of the closed-loop system. (25 marks)

(3) When *K*=1, draw Bode diagram of the open loop system in the w-plane by using any available method. (25 marks)

(4) Design the controller gain *K* so that the phase margin of the digital control system is 50^o . With this value of *K*, determine the gain margin. (25 marks)