



Name:

ID:

Assume any missing data....The exam is two questions.

*Books & notes are not allowed.

Attempt the following questions:

Max. Marks (30)

Question 1:

(18marks)

(1-a) Derive the pulse T.F. for a Zero Order Hold having a sampling period $T=0.2$ sec. then, show how it acts as a low-pass filter through frequency response analysis? **(7marks)**

(1-b) Solve the following difference equation: **(5marks)**

$$C(k+2) + 6C(k+1) + 8C(k) = 3^k \quad \text{Given that: } C(0) = 0, C(1) = 1.$$

Then, sketch: $C(k)$, for $K=0, 1, 2, \dots, 5$.

(1-c) Plot the following poles on Z-plane: $S_{1,2} = 5 \pm j8$, $S_{3,4} = -8 \pm j7$, where $T=0.2$ sec. **(3marks)**

(1-d) Plot the following poles on S-plane: $Z_{1,2} = 4 \pm j5$, $Z_{3,4} = 0.4 \angle \pm 50^\circ$ and $T=0.2$ sec. **(3marks)**

Question 2:

(12marks)

(2-a) For $C(Z) = \frac{0.36Z}{(Z-1)(Z-0.456)}$ find the final value of $C(k)$. **(2marks)**

(2-b) Find the pulse transfer function for the system shown in fig.1. **(10marks)**

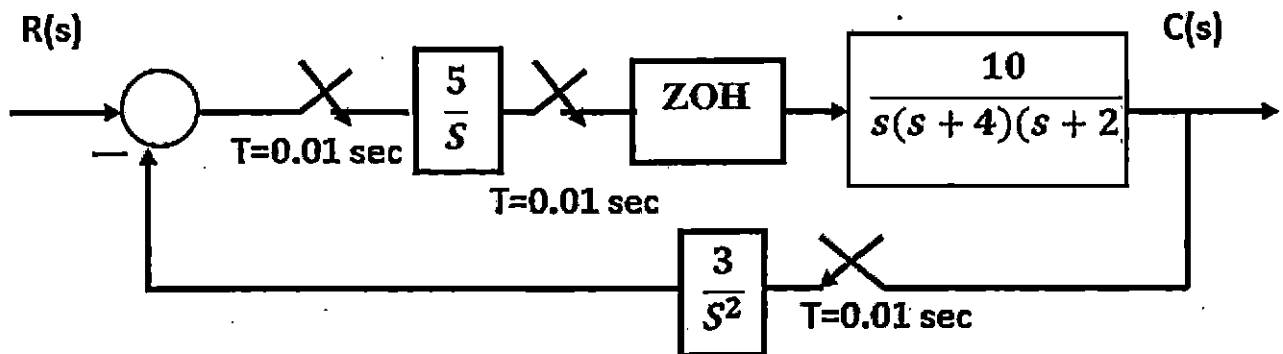


Fig.1.

With my best wishes,
Dr. Mahmoud M. Saafan,
2:00 PM, Thursday, 14th Nov. 2019.