



الرقم:

الاسم:

Digital Control  
1st 2019- 2020  
1st Exam

Answer all questions  
Time: 50 minutes  
Dr. Jasim Ghaeb

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**Q1: 6-marks.** Derive the  $z$ -transform of the function below, assuming  $T=1$ :

$$f_{(t)} = \left(\frac{1}{2}\right)^t$$

**Q2: 4-marks).**

A-) What is the analog band of the binary code: .10110

B-) Give the number of voltage bands and resolution of 6-bit ADC.

**Q3: 5-marks).** The full- scale reference voltage of a 5-bit A/D is 15 V. The analog number comes between two digital levels is rounded off to a digital level. Determine the maximum analog input signal to A/D without exceeding the quantization error.

**Q4: 5-marks).** Find the output response for a unit impulse input at  $k= 0, 1, 2$  and  $3$  for the open-loop system shown in Figure 1.

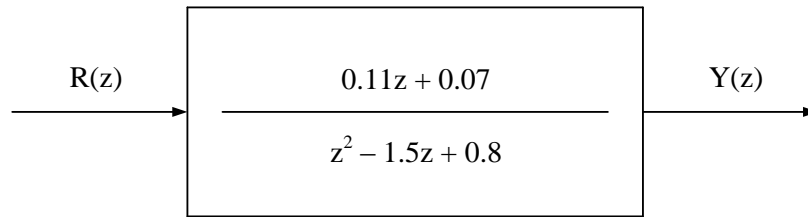


Figure 1