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APJ Abdul Kalam Technological University

Ernakulam II Cluster

Second Semester M.Tech Degree Examination April 2018

05EC 6002 –MIXED SIGNAL VLSI DESIGN

(VLSI and Embedded Systems)

Time: 3 Hours. Max. Marks: 60

1. a) Explain the transfer function of a general second order filter and specify it for various types of second order filters. (4 Marks)

   b) With neat diagram, derive the expression for equivalent resistance of the following switched-capacitor resistors. (i) Parallel (ii) Serial and (iii) Series-parallel. (8 Marks)

2. a) Draw the block diagram of differential first order Gm-C filter and derive the expression for its output. (7 Marks)

   b) What is the requirement of tuning in integrated continuous time filters? Explain tuning in G_m–C filters. (5 Marks)

3. a) Explain quantization error in data converters. Also derive the expression for $V_{Q\,(rms)}$. (9 Marks)

   b) Explain the working of pipeline DAC.Compare it with cyclic DAC. (9 Marks)

OR

4. a) What is an INL and DNL error? (9 Marks)

   b) With neat diagram, explain the working of two-step flash ADC. Compare it with simple flash ADC. (9 Marks)

5. a)What do you mean by noise shaping in data converter?What are the advantages of oversampling without noise shaping? (9 Marks)

   b) With block diagram, explain the working of Δ-∑ADC. (9 Marks)

OR

6. a) How noise shaping is done in data converter? Compare oversampling with and without noise shaping. (9 Marks)

   b) With block diagram, explain the working of Δ-∑DAC. (9 Marks)