

Contents

Part I Transduction in Micro-Nano Devices

1 Actuation and Sensing in Micro/Nano System	3
Vinayak Pachkawade	
2 Acoustic Devices for Gas Sensing and RF Applications in MEMS/NEMS	25
Soumi Mukherjee, Alok J. Verma, Shobha Shukla, and Sumit Saxena	

Part II Micro-Nano Systems for Healthcare

3 MEMS in Twenty-First-Century Healthcare	71
Tanzila Noushin, Mohammad Salman Parvez, Prosanto Biswas, Md. Emran Hossain Bhuiyan, Md. Abdullah al Rumon, and Shawana Tabassum	
4 Analysis of Resistance and Thrombogenicity of a Composite Coating Based on Collagen and Carbon Nanotubes Using a Microfluidic Chip	133
K. D. Popovich, A. Yu. Gerasimenko, D. V. Telyshev, and S. V. Selishchev	

Part III Energy Harvesting

5 Advancements in MEMS Vibration Energy Harvesters	163
Seyedfakhreddin Nabavi	

Part IV CMOS MEMS

6 CMOS Amalgamated MEMS/NEMS: Pioneering Technology for the Modern Semiconductor Cosmos and Future World	187
Soumya Sen, Abhishek Chauhan, Ashish Raman, and Mamta Khosla	

**7 CMOS-MEMS Sensors with FET-Based Transduction:
A Paradigm Shift** 219
Pramod Martha, Naveen Kadayinti, and V. Seena

Part V Materials and Packaging

**8 New and Emerging Materials for MEMS/NEMS: Properties
and Characterization** 265
Olga Jakšić and Zoran Jakšić