BIO-MEMS AND NANO TECHNOLOGY

FINAL EXAM

INSTRUCTIONS: Attempt all the questions in **SECTION ONE** and any other **FIVE** in **SECTION TWO**

SECTION ONE (20 MARKS)

1. Define the following terms as are used in Bio-mems and Nano technology. **(10 Marks)**
   a. Micro-electrical mechanical systems (MEMS)
   b. Lithography
   c. Actuators
   d. Lab on chip (LOC)
   e. Nano fabrication
2. State five ways in which hazardous identification of nanomaterials can be performed ideally **(10 Marks)**

SECTION TWO (70 MARKS)

3. What do you understand by Nanotoxicology? **(10 Marks)**
4. a. State two principles components of MEMS **(4 Marks)**

   b. name and explain 4 types of materials used for mems manufacturing **(6 Marks)**
5. Discuss five applications of MEMS in health-care **(10 Marks)**
6. Discuss the five types of Lithography techniques **(10 Marks)**
7. Define the term etching and state five and briefly explain etching processes **(10 Marks)**
8. What do you understand by ion implantation? **(10 Marks)**
9. a. Define micro-sensors and state some of their classifications **(6 Marks)**

   b. State the four types of actuators **(4 Marks)**
10. Discuss the advantages and limitations of lab on a chip technology **(10 Marks)**

11. Name and discuss five trends in MEMS for health care (only mention instances where MEM implants performed in the human body apply) stating some of the uses **(10 Marks)**