****

**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

**End Semester Examination – Nov/Dec – 2016**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **11NT302** | **Duration :** | **3hrs** |
| **Sub. Name :** | **NANOLITHOGRAPHY** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Marks** |
| 1. | a. | Schematically illustrate the fabrication of P-MOS using positive resist. | 10 |
| b. | Draw a flow chart representing the various steps involved in MEMS Design flow. | 5 |
| c. | Discuss few applications of MEMS in different fields. | 5 |
| (OR) | | | |
| 2. |  | Assuming a negative resist, explain the fabrication process of CMOS invertor through a neat schematic using n –well process. | 20 |
| 3. | a. | Explain the lithography technique which obeys Moore’s law. | 10 |
|  | b. | Schematically explain the working principle of Scattering with Angular Limitation Projection Electron beam Lithography (SCALPEL). | 10 |
| (OR) | | | |
| 4. | a. | Write a note on i).Instrumentation ii).Sources and iii).Scattering technique ofcharged particle lithography | 15 |
|  | b. | Mention few advantages and disadvantages of charged particle lithography. | 5 |
| 5. | a. | What is soft lithography? | 2 |
|  | b. | Explain the different types of soft lithography with a neat diagram. | 18 |
| (OR) | | | |
| 6. | a. | Discuss the significance of Dip Pen Lithography. | 10 |
|  | b. | Briefly explain the lithography technique which is a hybrid of top-down and bottom-up approach | 10 |
| 7. | a. | Write a note on significance of Langmuir Blodgett Resists. | 10 |
|  | b. | Schematically illustrate the working principle of Atomic Force Microscope. | 10 |
| (OR) | | | |
| 8. | a. | Write a note on Nano pattern synthesis. | 10 |
|  | b. | Explain the working principle of Scanning Tunneling Microscope with a neat diagram. | 10 |
|  | | **Compulsory:** |  |
| 9. |  | Explain in detail the various steps involved in lithography process with a neat diagram. | 20 |

ALL THE BEST