Name: **Enrolment No:**	

UPES

End Semester Examination, May 2025

Programme Name : BTech ECE **Semester : 6**

Course Name : Nano-Electronics Devices **Time : 03 hrs**

Course Code : ECEG3063P_3 **Max. Marks: 100**

Nos. of page(s) : 2

Instructions: Use of scientific calculators is allowed

Q -11 is Compulsory; students can choose any one option in Q-10. In Q-9 Student can choose any one option

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Define De-wetting in lithography-based fabrication. Provide one example where it is useful.	**4**	**CO1**
Q 2	Explain the principle of Molecular Electronics? List its applications in modern devices.	**4**	**CO1**
Q 3	Describe Hot Embossing process.	**4**	**CO2**
Q 4	Explain the working of a bulk micromachining process.	**4**	**CO1**
Q 5	What are the limitations of resolution in lithography? List two methods to enhance it.	**4**	**CO2**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Describe the working of Flip-chip bonding using suitable diagrams.	**10**	**CO3**
Q 7	Explain the Sputtering and Chemical Vapor Deposition (CVD) techniques. Compare both in terms of applications and limitations.	**10**	**CO1**
Q8	Explain the working of bubble micro pump with suitable diagrams.	**10**	**CO2**
Q 9	Explain, micro-stereo lithography process in detail. OR Discuss accelerometer sensors in MEMS with working principle and applications.	**10**	**CO2**
	SECTION-C **(2Qx20M=40 Marks)**		
Q 10	a) Compare Microfluidic mixers: passive and active types. OR	**20**	**CO2**

	b) Explain the various sensor applications of MEMS/NEMS systems in biomedical devices. Give suitable examples.		
Q 11	a) Using a flow-chart, explain photo-lithography process. b) Explain the fabrication and applications of Single-Electron Transistors (SETs).	**20**	**CO3**