

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2018****Subject Code:2153901****Date:27/11/2018****Subject Name:Fabrication of Nano- devices****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Define Source, Drain, Gate and Channel in MOSFET.	03
	(b) Describe Quantum wells, wires, and dots. Its size and dimensionality effects.	04
	(c) Explain Single Electron Tunneling with proper circuit diagram, Quantum conditions and Coulomb Staircase.	07
Q.2	(a) What is CMOS explain briefly.	03
	(b) Explain Core-Shell Structures.	04
	(c) Describe Excitons and its types. Briefly explain the concept of binding energy and its effect on special extension.	07
	OR	
	(c) Describe Graphene.	07
Q.3	(a) Define Briefly different types of Lithography.	03
	(b) Explain DNA based Biosensors.	04
	(c) Write a short note on Protein Based Biosensors.	07
	OR	
Q.3	(a) Define Semiconductor Quantum Dots.	03
	(b) What are Tunnel Diodes and Explain Resonant Tunneling Transistor	04
	(c) Explain how Nanosensors are used in Sensing various gases.	07
Q.4	(a) Define Gas Sensitivity.	03
	(b) Explain Nano Robotics and Nanomanipulation.	04
	(c) Write shot note on MOSFET (Components, Working Application with Diagrams)	07
	OR	
Q.4	(a) Define Magnetic Nanoparticles and its Applications.	03
	(b) Define Photonic Crystals and its types.	04
	(c) Define Schottky Contact, Schottky Barrier, Diode and hence list Applications of Schottky Device.	07
Q.5	(a) Write down Applications of Single Electron Tunneling.	03
	(b) Explain Atom lithography.	04
	(c) Explain X-Ray Lithography.	07
	OR	
Q.5	(a) List out Applications of Photonic Band Gap Devices.	03
	(b) Describe Graphene.	04
	(c) Describe Single Electron Devices and Single Electron Dynamics.	07
