15EC551

Visvesvaraya Technological University, Belagavi

MODEL QUESTION PAPER

5th Semester, B.E (CBCS) EC/TC

Course: 15EC551- NANOELECTRONICS

Time: 3 Hours **Max. Marks: 80**

Note: (i) Answer Five full questions selecting any one full question from each Module.

(ii) Question on a topic of a Module may appear in either its 1st or/and 2nd question.

Module 1			
1	a	Give an overview of development milestones in microfabrication in electronic industries.	8M
	b	State Mores law. Apply the same to explain the continued miniaturization seen in the field of electronics.	8M
OR			
2	a	Classify conductors, insulators and semiconductors based on its electronic properties.	8M
	b	Distinguish the top down and bottom up approach for fabrication of Nanostructures.	8M
Module 2			
3	a	Discuss the working principle of scanning electron microscopy.	8M
	b	Evaluate the Quantum Confinement in Semiconductor Nanostructures.	8M
OR			
4	a	Define Braggs Law. Summarize the working principle of X-ray Diffractometer with a neat sketch.	10M
	b	Write a brief note on electronic density of states.	6M
Module 3			
5	a	Explain the major steps involved in photolithography technique.	8M
	b	Give an account on quantum hall effect and resonant tunneling.	8M
OR			
6	a	Explain the characterization methods and tools used in the analysis of optical and electrical characterization of any semiconductor nanostructures.	10M
	b	Explain the phenomenon in quantum confined stark effect.	6M
Module 4			
7	a	Classify and describe different types of carbon nanostructures.	10M
	b	Explain the wrapping arrangements in carbon nanotubes and its effects on electronic properties.	6M
OR			
8	a	Demonstrate the application of SWCNT in field effect transistors as sensors.	8M
	b	Differentiate between the electrical behavior of SWCNT and MWCNT	8M
Module 5			
9	a	Discuss the basic working principle of sensors. How do nanosize effect the efficiency of a sensor.	8M

	b	Quantum size effect can be applied to develop Nano sensors, Justify	8M
		OR	
10	a	Write a note on injection laser and its working principles.	8M
	b	Describe nano sensors based on physical properties.	8M