

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020

Subject Code:2173902

Date:21/01/2021

Subject Name:Spintronics

Time:10:30 AM TO 12:30 PM

Total Marks: 56

Instructions:

- 1. Attempt any FOUR questions out of EIGHT questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**

		MARKS
Q.1	(a) Define : Scattering in multilayer	03
	(b) Explain: Periodic Super Lattice for magnetoresistance in vicinity of resistor network.	04
	(c) Write a short note on Stern-Gerlach experiment.	07
Q.2	(a) Write down various reasons for the spin scattering in Spintronics devices.	03
	(b) Explain : Spin – Orbit interaction	04
	(c) Explain working of Spin LED with necessary diagram.	07
Q.3	(a) What do mean by Magnetic domain wall?	03
	(b) Discuss real experiment problems associated with Spin-LED device.	04
	(c) Explain :Spin photo electronic devices	07
Q.4	(a) Define : Current driven domain wall motion	03
	(b) Draw geometry for oblique Hanle geometry LED	04
	(c) Briefly explain importance of history of electron spin for Spintronics.	07
Q.5	(a) What do you mean by Quantum Mechanics.	03
	(b) Explain : Role of ferromagnetic Heusler alloy in Spintronics devices	04
	(c) Explain: Resistance change in multilayer structure.	07
Q.6	(a) Draw current flows mechanism in CPP geometry in device.	03
	(b) Explain: Scattering based magnetoresistance in multilayer.	04
	(c) Write a short note on Domain wall velocity measurements.	07
Q.7	(a) What is magnetization reversal process?	03
	(b) Explain: Spin and exchange effect in quantum dot.	04
	(c) Explain: domain-wall propagation and domain wall nucleation	07
Q.8	(a) Sketch spin based silicon transistor with necessary notation.	03
	(b) Explain role of Oxide-based tunnel injectors.	04
	(c) Explain: Ratchet effect in domain wall.	07