

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2021****Subject Code:3173906****Date:13/12/2021****Subject Name:Megnetoelectronics And Spintronics****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Define :Spin Valves	03
	(b) Write a short note on ferromagnetic metals.	04
	(c) In brief explain : History and overview of magnetic recording	07
Q.2	(a) What do mean by half metals?	03
	(b) Differentiate: Magnetic anisotropy vs Magnetostriction	04
	(c) Write a short note on Giant Magneto resistance (GMR) Heads	07
OR		
Q.3	(c) Explain : Stoner-Wohlfarth theory	07
	(a) Define: Domain wall	03
	(b) Draw the schematic arrangement of Stern-Gerlach experimental setup.	04
	(c) Explain in brief: Domain wall velocity measurements.	07
OR		
Q.3	(a) Define: Eddy current loss	03
	(b) Explain: Spin polarization in vicinity of magneto resistance.	04
	(c) Explain: Ratchet Effect with necessary diagram.	07
Q.4	(a) What do you mean by High-gradient read heads	03
	(b) Explain: Domain wall scattering.	04
	(c) Explain Tunneling Magneto resistance (TMR) heads.	07
OR		
Q.4	(a) Define: Spintronics	03
	(b) Differentiate: Soft and hard magnetic materials;	04
	(c) Explain: Magnetism in solid state	07
Q.5	(a) What do mean by Quantum Computing with spins?	03
	(b) Explain: Concept of current-driven domain wall motion	04
	(c) Explain: The Bohr planetary model and space quantization.	07
OR		
Q.5	(a) Define : Field Sensors	03
	(b) Explain : MRAMS	04
	(c) Write a short note on Spintronics Biosensors.	07