Reg. No.												

Question Paper Code	12175

B.E. / B.Tech - DEGREE EXAMINATIONS, NOV / DEC 2023

Seventh Semester

Artificial Intelligence and Data Science

20ECOE907- INDUSTRIAL NANOTECHNOLOGY

(Regulations 2020)

Duration: 3 Hours Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	What do you understand about nanoparticles?	*2,K1,CO1*
2.	State EMI shielding.	*2,K1,CO1*
3.	What is the effect of mass reduction in ground and under water military vehicles?	*2,K2,CO2*
4.	What are autonomous vehicles?	*2,K2,CO2*
5.	Define quantum computers.	*2,K1,CO3*
6.	Write the environmental hazards of nanopesticides.	*2,K1,CO3*
7.	What is the main benefit of nanoscale manipulation in food processing?	*2,K1,CO4*
8.	How can nano-tracers be used to prevent fraud in the food industry?	*2,K2,CO4*
9.	Which term is used to describe the proteins coating nano materials inside the body?	*2,K2,CO5*
10.	Provide two protective measures to minimize risks from skin exposure to nanoparticles.	*2,K2,CO6*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Define actuator. Explain the various types of actuators.	*13,K2,CO1*
		OR	
	b)	Explain in detail about the mechanism of EMI shielding.	*13,K2,CO1*
12.	a)	Discuss in detail the full advantage of nanotechnology in small and very small autonomous, satellite and space launcher system.	*13,K2,CO2*
		OR	
	b)	Explain in detail about the potential military application of nanotechnology in the field biological, chemical weapons and its protection systems.	*13,K2,CO2*

13. a) Discuss in detail the application of nanotechnology in IR blocking filters and Quantum computers. *13,K2,CO3*

OR

b) Explain in detail about nano pesticides and its application in the field of agriculture advantages. *13,K2,CO3*

14. a) Provide case studies of specific food products or brands that have successfully implemented nano packaging for prolonged shelf life. *13,K2,CO4*

OR

b) Discuss the key stages involved in food processing and their importance in ensuring food safety. *13,K2,CO4*

15. a) Discuss the major sources and effects of air pollution in urban areas. Explore the role of industrial activities in contributing to air pollution and its impact on public health. *13,K2,CO5*

OR

b) Examine the use of nanomaterial for air and gas purification, focusing on their ability to capture pollutants and improve air quality. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Examine the role of sensors in detecting and monitoring nanoparticles in various environments and also discuss recent advancements in nanoparticle sensor technologies and their potential applications. *15,K2,CO6*

OR

b) Explore the risks and effects of skin exposure to nanoparticles and also discuss protective measures and potential technologies to minimize skin exposure risks. *15,K2,CO6*