Reg. No.



(A constituent unit of MAHE, Manipal)

II SEMESTER M.TECH. END SEMESTER EXAMINATIONS MAY 2019

SUBJECT: NANOSCIENCE AND TECHNOLOGY [CHE 5239]

REVISED CREDIT SYSTEM (04/05/2019)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

✤ Answer ALL the questions.

1 A .	Briefly describe the following i) Nanosensors ii) Functionalization of nanoparticles iii) Nanobots	3x2
1B.	Write short noted on i) Fullerenes and ii) Carbon nanotubes iii) Graphene	4
2A.	What is meant by quantum confinement? What is bandgap? Describe the effects of quantum confinement on bandgap.	05
2B.	Describe the working of SEM with a neat schematic diagram. What are the differences in working principle and applications of SEM and AFM?	05
3A.	 Describe the following: i) Air remediation method using nanosize TiO₂ semiconductor photocatalyst. ii) Water disinfection using any bioactive nanomaterial. 	2x2.5
3B.	What are nanofluids? What typical materials do they comprise of? What are their special properties? Describe their applications.	05
4A.	List the different methods of nanomaterial synthesis and describe the synthesis of nanoparticles employing biological methods in detail.	05
4B.	Describe the use of nanotechnology in medical applications.	05
5A.	Describe the following methods of determining the nanoparticle size. i) Dynamic Light Scattering ii) Coulter counter technique	2x2.5
5B.	What are the potential hazards nanomaterials pose to human health? Describe the 5 principles of design for safer nanotechnology.	05