Code No: **RT41089** **R13** **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, February/March - 2018

NANOTECHNOLOGY

(Chemical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
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PART–A *(22 Marks)*

1.	a)	Write about history of nano materials.	[4]
	b)	What are the advantages and disadvantages of Bottom-up approach?	[4]
	c)	Explain about micro electro mechanical systems.	[4]
	d)	Write about the nano indentation.	[3]
	e)	Explain about aqueous forces in acid base system.	[4]
	f)	Write about depletion interactions.	[3]

PART–B *(3x16 = 48 Marks)*

2.	a)	Explain about the effects of nano dimensions on materials behavior.	[10]
	b)	Write about microstructure features.	[6]
3.		Explain about Top-down approach in detail.	[16]
4.	a)	Explain about applications of nano materials in paints and energy industries.	[8]
	b)	Describe the impact of nano materials in defense and space industries.	[8]
5.	a)	Explain about Atomic Force Microscopy (AFM) to characterize nano materials.	[8]
	b)	Explain about Scanning Tunneling Microscopy (STM) to characterize nano materials.	[8]
6.	a)	Explain in detail double layer forces in acid phase system.	[8]
	b)	Describe about importance of double layer forces in acid base system.	[8]
7.	a)	Explain about hydro phobic forces layering in detail.	[12]
	b)	Write the applications of nano scale particles.	[4]

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