Code No: R194103N **R19** **Set No. 1**

IV B. Tech I Semester Regular Examinations, November – 2022
NANOTECHNOLOGY
(Open Elective)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
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UNIT-I

1	a)	What is the Quanta of energy? Mathematically bring out an expression for it.	[7]
	b)	With the help of neat schematic describe band structure for insulators and conductors.	[8]
		(OR)	
2	a)	What are optical phenomena bonding in solids? Briefly explain them.	[7]
	b)	What is the difference between Isotropic and anisotropic property of substance? Explain it by suitable examples.	[8]

UNIT-II

3	a)	What are applications of Silicon carbide?	[7]
	b)	What are the different techniques to prepare nanoparticle?	[8]
		(OR)	
4	a)	Briefly explain suitable method to prepare Aluminium nanoparticles.	[7]
	b)	How does X-ray diffraction data pattern uses in characterizing materials?	[8]

UNIT-III

5	a)	What are the steps involved in preparation for strength measurement?	[7]
	b)	Bring out an comparative study between mechanical data of "α "and "β" - SiC.	[8]
		(OR)	
6	a)	What are the steps involved in measurement of flexural strength?	[7]
	b)	How does flexural strength as a function of temperature of α- silicon carbide?	[8]

UNIT-IV

7	a)	What is memory switching?	[7]
	b)	How does Glass is manufactured using Nanoparticles?	[8]

(OR)

8	a)	What is NonLinear Refractive index?	[7]
	b)	What is accidental anisotropy Birefringe- Elasto optic effect?	[8]

UNIT-V

9	a)	Explain Deposition of Metal Chalcogenides.	[7]
	b)	Explain the Epitaxial Growth of quantum Dots and In Situ Studies of Epitaxial Growth.	[8]

(OR)

10	a)	Briefly discuss sputtering of Non crystalline powder.	[7]
	b)	Discuss Plasma enhanced CVD.	[8]

Code No: R194103N **R19** **Set No. 2**

IV B. Tech I Semester Regular Examinations, November – 2022
NANO TECHNOLOGY
(Open Elective)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
*****

UNIT-I

1	a)	What is Isomer Shift?	[7]
	b)	What is difference between stimulated and spontaneous emissions?	[8]
		(OR)	
2	a)	What is quadrupole splitting?	[7]
	b)	Briefly discuss on transition dipole bracket.	[8]

UNIT-II

3	a)	Briefly discuss Gas Phase condensation technique for synthesis of nanoparticles.	[7]
	b)	What is sintering of SiC? Explain the role of Dopants.	[8]
		(OR)	
4	a)	Briefly discuss DC Arc Plasma technique for synthesis of nanoparticles.	[7]
	b)	Briefly discuss attrition milling. Suggest the influence of different fluid media against particle size for alumina particles.	[8]

UNIT-III

5	a)	Briefly discuss Weibull Theory.	[7]
	b)	Briefly discuss data analysis of theoretical strength.	[8]
		(OR)	
6	a)	Briefly discuss Stress Intensity factor.	[7]
	b)	Schematically represent applied stress vs spatial elongation curve.	[8]

UNIT-IV

7	a)	Briefly write electro- optic and acousto- optic effect.	[7]
	b)	Explain briefly Electrical conduction in Bismuth glasses.	[8]

(OR)

8	a)	Briefly write short note on (A). Gold ruby glass (B) Silver Ruby.	[7]
	b)	Explain briefly Electrical conduction in Selenium glasses.	[8]

UNIT-V

9	a)	Discuss Gas phase condensation of nanoparticles.	[7]
	b)	Briefly discuss electron deposition of nanocomposites.	[8]

(OR)

10	a)	Discuss Sol-gel techniques to synthesis Nanopowder.	[7]
	b)	Write short notes on different methods of PECVD o produce thin films.	[8]

Code No: R194103N **R19** **Set No. 3**

IV B. Tech I Semester Regular Examinations, November – 2022
NANO TECHNOLOGY
(Open Elective)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
*****

UNIT-I

1	a)	What is Hyper fine splitting?	[7]
	b)	Briefly discuss on the Optical transition.	[8]
		(OR)	
2	a)	What is spin Canting?	[7]
	b)	Bring out expressions for spontaneous emissions.	[8]

UNIT-II

3	a)	Briefly discuss Sono hydrolysis technique for synthesis of nanoparticles.	[7]
	b)	What is sintering of SiC? Explain the role of Carbon.	[8]
		(OR)	
4	a)	Briefly discuss Ultra sonic flame Pyrolysis technique for synthesis of nanoparticles.	[7]
	b)	Briefly discuss on microwave sintering of nanoparticles. What are the merits of it?	[8]

UNIT-III

5	a)	Briefly discuss fracture toughness and its significance.	[7]
	b)	With a schematic represent the variation of Weibull modulus strength at 1400 ^{o} C temperature for α- silicon carbide.	[8]
		(OR)	
6	a)	With a schematic represent the variation of fracture toughness as function of temperature for α- silicon carbide	[7]
	b)	Discuss data analysis approach for calculating theoretical strength.	[8]

UNIT-IV

7	a)	What is difference between Linear and Non- Linear refractive Index?	[7]
	b)	Explain briefly Electrical conduction in Bismuth glasses and Selenium.	[8]

(OR)

8	a)	Briefly discuss electro – optic effect.	[7]
	b)	What is tunnelling conduction in nanoparticles?	[8]

UNIT-V

9	a)	What are the common alkoxides for Sol- Gel processing?	[7]
	b)	Describe High energy attrition milling process to synthesis nanopowder.	[8]

(OR)

10	a)	What are common reactions occur in Non- aqueous process?	[7]
	b)	What are the advantages of electro-deposition for synthesis of the nano scale materials?	[8]

Code No: R194103N **R19** **Set No. 4**

IV B. Tech I Semester Regular Examinations, November – 2022
NANO TECHNOLOGY
(Open Elective)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
*****

UNIT-I

1	a)	What is collective magnetic excitation?	[7]
	b)	Briefly discuss Quantum Mechanical Covalency.	[8]
		(OR)	
2	a)	What is meant by Interpretation of Mossbauer data?	[7]
	b)	Briefly discuss anisotropy in a Single crystal.	[8]

UNIT-II

3	a)	With the help of schematic explain the variation of α- SiC in different atmosphere.	[7]
	b)	What is sintering of SiC? Explain the role of Sintering atmosphere.	[8]
		(OR)	
4	a)	Explain the variation of bulk density of sintered α- SiC with AIN with the help of a neat schematic.	[7]
	b)	What is the principle of Scanning Electron microscope? How does Alpha Etch differ to Beta Etch?	[8]

UNIT-III

5	a)	What is importance of Single Edge Notch Bend specimen technique?	[7]
	b)	With a schematic represent the variation of Weibull modulus strength at room temperature for α- silicon.	[8]
		(OR)	
6	a)	Briefly discuss basic concept of Nanocrystalline SIC.	[7]
	b)	Discuss data analysis of theoretical strength of nanomaterial.	[8]

UNIT-IV

7	a)	What is Photochromy?	[7]
	b)	What is Verwey Transition of nanoparticles?	[8]

Code No: R194103N **R19** **Set No. 4**

(OR)

8	a)	Brielfy discuss on Luminescent glasses.	[7]
	b)	Briefly discuss impurity states Electronic conduction.	[8]

UNIT-V

9	a)	How glass- metal nanocomposites are synthesized?	[7]
	b)	What is dye doped gel glasses?	[8]

(OR)

10	a)	How does Metal – silica and metal oxide – silica nanocomposites are synthesized?	[7]
	b)	How does GDLC films composites are synthesized?	[8]