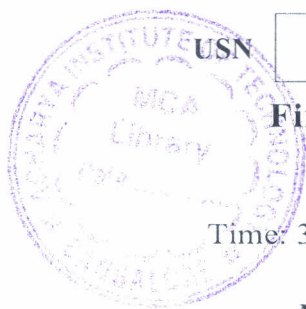


# CBCS SCHEME



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BETCK105C/ BETCKC105

## First Semester B.E./B.Tech. Degree Examination, June/July 2024 Introduction to Nano Technology

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Define Nanotechnology. What are the future of nano technology explain briefly.	8	L2	CO1
	b.	What are the confinement of electron in 0D, 1D, 2D and 3D systems? Explain briefly.	8	L2	CO1
	c.	Describe the surface to volume ratio.	4	L2	CO1
OR					
Q.2	a.	Explain briefly with a neat sketch hydrothermal and chemical bath deposition.	10	L2	CO1
	b.	Describe with a help of neat diagram ball milling technique and sputtering laser ablation.	10	L2	CO1
Module – 2					
Q.3	a.	With help of neat diagram, explain basic principles and instrumentation of any one types of electron microscopy.	10	L2	CO2
	b.	Explain with a neat sketch for the following: i) Scanning tunneling micro scope ii) Atomic force micro scope.	10	L2	CO2
OR					
Q.4	a.	What are the different types of imaging modes? Explain briefly.	8	L2	CO2
	b.	With the help of neat sketch, explain the working principle of X-ray diffraction.	8	L2	CO2
	c.	What are the applications of IR, UV/VIS?	4	L1	CO2
Module – 3					
Q.5	a.	Define synthesis. Explain different types of synthesis.	10	L2	CO3
	b.	Explain the what are the properties, applications of graphene, SWCNT and MWCNT.	10	L2	CO3

OR

Q.6		Explain the following with respect to the carbon based materials: i) Carbon nano composites ii) Nano fibres iii) Nanodiscs iv) Nano diamonds.	20	L2	CO3
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Module – 4

Q.7	a.	Define solar cells. Explain with a neat sketch quantum dot sensitized solar cells.	10	L2	CO4
	b.	Describe second generation and third generation solar cells.	4	L2	CO4
	c.	Explain with a neat sketch, construction and working of dye sensitized solar cell.	6	L2	CO4

OR

Q.8	a.	Describe briefly with a neat sketch, working principles of nanotechnology in Lithium ion battery.	10	L2	CO4
	b.	Define fuel cells. Sketch and explain working of fuel cells and nano technology in hydrogen storage.	10	L2	CO4

Module – 5

Q.9	a.	Explain significant impact of nanotechnology and nanomaterials.	8	L2	CO5
	b.	What are the applications of biochemical and electronic or nano electronics.	8	L1	CO5
	c.	Explain the medicine and health care applications of nano technology.	4	L2	CO5

OR

Q.10	a.	What are the applications of following with respect to nano technology? i) Nano-computers ii) Nano-chemistry iii) Nano-photonics iv) Agriculture and food applications.	16	L1	CO5
	b.	List the recent-major breakthrough in nanotechnology. Explain briefly.	4	L2	CO5

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