

(d)	Small size	
1-e.	DNA detection through the _____ by using the oligonucleotide functionalised gold nano crystals is developed. (CO5, K1)	1
(a)	Colorimetric	
(b)	Diathermy	
(c)	Electro therapy	
(d)	Treatment tables	
2.	Attempt all parts:-	
2.a.	List some methods for making 1-D AND 2-D nanomaterials. (CO1, K1)	2
2.b.	What are the uses of fullerenes? (CO2, K1)	2
2.c.	List the parts of TEM. (CO3, K1)	2
2.d.	What are nanocapsules? (CO4, K1)	2
2.e.	Briefly describe the principles of Toxicology. (CO5, K1)	2
	<u>SECTION-B</u>	20
3.	Attempt all parts:-	
3.a.	Answer any <u>one</u> of the following:-	
3.a.(i)	Explain the approaches in Nanobiotechnology. (CO1, K2)	4
3.a.(ii)	Discuss the Emergence of Nano technology. (CO1, K2)	4
3.b.	Answer any one of the following:-	
3.b.(i)	Explain Quantum Dots and its applications. (CO2, K2)	4
3.b.(ii)	What are the factors affecting nanoparticles. (CO2, K2)	4
3.c.	Answer any one of the following:-	
3.c.(i)	Explain Photo Lithography in detail. (CO3, K2)	4
3.c.(ii)	Discuss the advantages and disadvantages of using AFM. (CO3, K2)	4
3.d.	Answer any one of the following:-	
3.d.(i)	Explain Nanorobots, write their application in medicine. (CO4, K2)	4
3.d.(ii)	Discuss Nanofluids and their uses. (CO4, K2)	4
3.e.	Answer any one of the following:-	
3.e.(i)	Discuss history and origin of toxicology. (CO5, K2)	4
3.e.(ii)	Discuss assessment of nanoparticles toxicity with a case study. (CO5, K2)	4
	<u>SECTION-C</u>	35
4.	Answer any <u>one</u> of the following:-	
4-a.	Describe in detail about the microfabrication technique. (CO1, K2)	7
4-b.	Discuss in detail about the chemical and biological synthesis of nanoparticles. (CO1, K2)	7
5.	Answer any <u>one</u> of the following:-	
5-a.	Discuss Lithography in detail. (CO2, K2)	7
5-b.	How are metal nanoparticles differ from nanoparticles derived from viruses? Explain viruses as nanoparticles in details. (CO2, K3)	7

6. Answer any one of the following:-

- 6-a. Explain SEM & STM in detail. (CO3, K2) 7
- 6-b. Discuss in detail about Atomic Force Microscopy instrumentation, parameters measured and imaging modes? (CO3, K2) 7

7. Answer any one of the following:-

- 7-a. Discuss in detail about the various applications of biosensors. (CO4, K2) 7
- 7-b. Explain contribution of nanobiotechnology in immobilization assay. (CO4, K2) 7

8. Answer any one of the following:-

- 8-a. Discuss the cytotoxicity in nano material. (CO5, K2) 7
- 8-b. Discuss in detail about Biomarkers. Also explain some cell culture studies. (CO5, K2) 7

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