Q. Code:840646

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Sixth Semester

OE18207 – BASICS OF NANOBIOTECHNOLOGY

(Regulation 2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Acquainting the basic biology and macromolecules in the application of nanotechnology.	**2**
CO 2	Describe the role of nanomaterials in biotechnology.	**2**
CO 3	Apply the knowledge of instrumental analysis methods for characterization of biomaterials.	**3**
CO 4	Implement the application of nanotechnology for construction materials and therapeutic drug delivery.	**3**
CO 5	Assess the societal impacts of nanobiotechnology.	**4**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Discuss on the multi functionality of protein molecule in living beings.	**1**	**2**
2.	Interpret the mechanism behind the transfer of information from one generation to the next through nucleic acids.	**1**	**2**
3.	List a few proteins involved in the flagellar motor mechanism of bacterial cell.	**2**	**2**
4.	Outline Lab On A Chip (LOC) technology.	**2**	**2**
5.	Discuss the working and application of AFM.	**3**	**3**
6.	Analyze the application X-ray diffraction for molecular structural characterization.	**3**	**3**
7.	Infer the photodynamic therapy in targeted drug administration.	**4**	**2**
8.	Assess the applications of quantum dots.	**4**	**2**
9.	List out the applications of engineered nanomaterials in human health sectors.	**5**	**2**

10.		How the nano materials impart toxicity to our body?	**5**	**2**	

PART- B (5 x 14 = 70 Marks)

			Marks	CO	RBT LEVEL
11. (a)	**(i)**	Elucidate the cell organelles responsible for energy generation and information storage with its structure and characteristics.	**(10)**	**1**	**3**
	(ii)	Discuss the special features of cell membrane.	**(4)**	**1**	**3**
		(OR)			
(b)	**(i)**	Interpret the different types and functions of proteins in human body	**(10)**	**1**	**3**
	(ii)	Assess the various functions of carbohydrates present in our body.	**(4)**	**1**	**3**
12. (a)	**(i)**	Analyze the function of Actin-Myosin muscular motors to drive our body with a neat diagrammatic sketch.	**(10)**	**2**	**3**
	(ii)	Interpret the application of biochips in nano scale detection.	**(4)**	**2**	**3**
		(OR)			
(b)	**(i)**	Assess the bacterial cell flagellar nano-motor structure and function.	**(10)**	**2**	**3**
	(ii)	Appraise the list of proteins involved in the flagellar motor mechanism of bacterial cell.	**(4)**	**2**	**3**
13. (a)		Elaborate the functioning of different types of electron beam aided microscopes with a neat sketch of their components.	**(14)**	**3**	**4**
		(OR)			
(b)		Detail the mechanism of XPS and SIMS with their applications.	**(14)**	**3**	**4**
14. (a)	**(i)**	Interpret the application of micro and nano electrochemical devices in drug delivery process.	**(7)**	**4**	**4**
	(ii)	Assess the importance and advantages of nanotechnology-based drug delivery system.	**(7)**	**4**	**4**
		(OR)			
(b)	**(i)**	Explore how quantum dots can be engineered and utilized for imaging, drug delivery, and diagnostic purposes.	**(7)**	**4**	**4**
	(ii)	Utilizing nano biosensors, describe how they can be applied in various biomedical applications, including disease diagnosis and monitoring.	**(7)**	**4**	**4**
15. (a)		Assess the role of nanomaterials in targeted drug delivery and diagnosis and explore the potential application in modern heal care.	**(14)**	**5**	**4**
		(OR)			
(b)		Apply the concept of plants and microbes as nano factories in the production of nanomaterials with specific applications and provide examples for how produce nanoparticles with desired properties for	**(14)**	**5**	**4**

biomedical, environmental, or industrial purposes.

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Develop a protocol for evaluating the toxic effects of engineered nanomaterials on human health and discuss the importance of conducting thorough risk assessments before the widespread use of nanomaterials in consumer products.	**(10)**	**5**	**5**

****