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Total Number of Pages: 2

**B.Tech**  
**PEBT5301**

**6<sup>th</sup> Semester Regular / Back Examination 2016-17**

**NANO BIOTECHNOLOGY**

**BRANCH: BIOTECHNOLOGY**

**Time: 3 Hours**

**Max Marks: 70**

**Q.CODE: Z696**

***Answer Question No.1 which is compulsory and any five from the rest.  
The figures in the right hand margin indicate marks.***

**Q1 Answer the following questions: (2 x 10)**

- a) What is bio-nanotechnology and nanobiotechnology?
- b) What are nanocapsules?
- c) Name two physical entities that have negligible effect on nanostructures?
- d) What do you mean by top-down approach of fabrication with example?
- e) List of application of biosensors in healthcare?
- f) What is DNA nano-tag?
- g) Enzymes use mostly which amino acid for chemical transformation?
- h) Give few examples of consumer products that are already being made using nanotechnology methods?
- i) Beside the small sizes, list at least two characteristic that Nanoparticles should have?
- j) What is negative photoresist?

**Q2 What are nano-biosensor? Explain the mechanism and types of nano-biosensor with applications. (2+8)**

**Q3 a) Briefly discuss about different forces involved in the maintaining the cell nano-interaction? (5)**

**b) Define CNT? Briefly explain structural types and various properties of CNTs. (5)**

- Q4 a)** Differentiate between bio-MEMs and LOC? (5)
- b)** Difference between self-assembly and self-organization? (5)
- Q5 a)** List five advantages that dry etching has when compared to wet etching. Also, list three of the most important disadvantages. (5)
- b)** What is the working principle of AFM? State its limitations in imaging. (5)
- Q6 a)** What do mean by nano-medicine? Explain. (5)
- b)** What are Magnetosome? Explain microbial biosynthesis of magnetosome with some examples. (5)
- Q7** What is photolithography? Describe the methods involved in photolithography and etching. (10)
- Q8 Write short note on any two (5 x 2)**
- a) Soft lithography
  - b) microfluidics
  - c) Bucky ball
  - d) Quantum Dots