Reg. No.



MANIPAL INSTITUTE OF TECHNOLOGY

II SEMESTER M.TECH. OPEN ELECTIVE

END SEMESTER EXAMINATIONS, APRIL/MAY 2017

SUBJECT: BIONANOTECHNOLOGY (BIO 5262)

REVISED CREDIT SYSTEM (03/05/2017)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

✤ Answer ALL the questions.

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Missing data may be suitable assumed.

| 1 A . | List the different types of nanomaterials and their sizes. Detail their main properties. | | | | | | |
|--------------|---|---|--|--|--|--|--|
| 1B. | Illustrate self-assembly based on complementary geometry association with a diagram | | | | | | |
| 1C. | Detail the differences between bionanotechnology & nanobiotechnology | | | | | | |
| 2A. | Explain working principle of TEM with applications | | | | | | |
| 2B. | Why carbon nanotubes (CNT) are considered as building blocks for future nanotechnological applications? | 4 | | | | | |
| 2C. | Write short notes on non-carbon nanotubes. | 2 | | | | | |
| 3A. | Explain the self-organization of viruses and phospholipids | 6 | | | | | |
| 3B. | Compare the properties of silk with steel. | 2 | | | | | |
| 3C. | Where does non-pathogenic amyloid exist? | 2 | | | | | |
| 4A. | Explain DNA based materials and their potential nanotechnological application | | | | | | |
| 4B. | Discuss with an example about the role of ion-channel nanopores and their specificity | | | | | | |
| 4C. | Write short notes on nano-motors with an example. | 2 | | | | | |

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| 5A. | Sketch the difference between DNA and PNA | | | | | | | | | | | 2 | |
| 5B. | Briefly describe S-layers and their utility in nanolithography | | | | | | | | | | 3 | | |
| 5C. | Describe any two medical applications of bionanotechnology | | | | | | | | | 5 | | | |