USN [| | | | | | | | |] **10NT762**

Seventh Semester B.E. Degree Examination, Dec.2017/Jan.2018
Nanotechnology in Food and Agriculture

Time: 3 hrs. Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1 a. Explain briefly about i) Dispersion Interaction and ii) Hydrophilic and Hydrophobic interactions. **(10 Marks)**
   b. Discuss about steric interactions leading to stabilization of dispersed particles by adsorbing polymers. **(05 Marks)**
   c. Write a note on Polymer brushes to prevent particle aggregation and Particle deposition at surfaces. **(05 Marks)**

2 a. Write a brief note on plate like structures in phase systems. **(10 Marks)**
   b. Explain about the types of spherically symmetric structures. **(10 Marks)**

3 a. Explain about Biosensors and DNA based biosensors and diagnostics. **(10 Marks)**
   b. Explain in detail about integrated nanosensor networks. **(10 Marks)**

4 a. What is Shelf life of packing? Explain the various methods to extend shelf life. **(10 Marks)**
   b. Discuss about the microwave pasteurization of fluid food materials and solid food materials. **(10 Marks)**

PART – B

5 a. What are the toxicity aspects associated with nano food? Explain how the toxic effect can be reduced in nano food. **(08 Marks)**
   b. List out and explain physical properties of packaging materials. **(06 Marks)**
   c. Explain about the necessity to package food products. **(06 Marks)**

6 a. Explain about different allergens present in food. **(10 Marks)**
   b. Discuss about molecular and macroscopic effect of food processing on food allergy. **(10 Marks)**

7 a. Explain how nanomaterials enhance the growth rate in plants. **(10 Marks)**
   b. Discuss about different biosensors used for monitoring soil condition and plant growth. **(10 Marks)**

8 a. What is Allergenic Potential? Explain about the impact of nano materials on Allergenic Potential. **(06 Marks)**
   b. Enumerate different innovations in agriculture and food nanotechnology. **(08 Marks)**
   c. What are the different stages in life cycle of nanotechnology food products? **(06 Marks)**

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