CBCS Scheme

USN | | | | | | | | | | |

15NT45

Fourth Semester B.E. Degree Examination, June/July 2018
Applications of Nanotechnology

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. What are photovoltaics? Discuss the applications of nanotechnology in photovoltaics. **(05 Marks)**

b. Discuss the construction and working of CdTe solar cell. **(05 Marks)**

c. Give construction and working of DMFC. How its efficiency can be improved using nanotechnology? **(06 Marks)**

OR

2 a. Discuss the applications of CNTs in photovoltaics. **(06 Marks)**

b. Explain in detail the role of nanotechnology in hydrogen fuel cells. **(10 Marks)**

Module-2

3 a. Discuss the general energy application of nanotechnology. **(04 Marks)**

b. Explain the role of nanoparticles in energy transmission development. **(04 Marks)**

c. What is oligodynamic effect? Explain the mechanism of oligodynamic action of nanoparticles with example. **(08 Marks)**

OR

4 a. What is nano filtration? Discuss the advantages and limitations of nanofiltration. **(05 Marks)**

b. What are the future directions of nanotechnology in membrane process? **(06 Marks)**

c. What are smart helmets? Explain the significance of nanotechnology assisted smart helmets. **(05 Marks)**

Module-3

5 a. Explain in brief nanoscale carriers and microfabricated xylem vessels. **(06 Marks)**

b. What is meant by nanobarcode technology? Explain applications of nanobarcode technology. **(06 Marks)**

c. What is nanofood? Explain. **(04 Marks)**

OR

6 a. What are zoonotic diseases? Explain. **(04 Marks)**

b. Discuss in detail the applications of nanotechnology in food packaging. **(12 Marks)**

Module-4

7 a. Discuss self cleaning coatings and anti-stain coatings with examples. **(08 Marks)**

b. Explain the following :

i) Anti - fogging coating

ii) Anti – microbial coating **(04 Marks)**

c. Describe the role of nanotechnology in chassis and tyres. **(04 Marks)**

OR

8 a. Discuss the role of nanoscale SiO_2 as corrosion resistance. **(06 Marks)**

b. Discuss the nanotechnology contribution in the implementation of
   i) Future requirements in space technologies and
   ii) Future mission in space travel. **(10 Marks)**

Module-5

9 a. What are FETs? Explain about MOSFET and CMOS. **(08 Marks)**

b. Describe quantum mechanical tunnel devices. **(04 Marks)**

c. Explain MEMs with their applications. **(04 Marks)**

OR

10 a. Explain in brief coulomb blockade, Miniature flash memory and Yano-type memory. **(08 Marks)**

b. Discuss the following :
   i) Spintronics
   ii) Photonic crystals
   iii) Plasmonics **(08 Marks)**

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