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10NT36

Third Semester B.E. Degree Examination, Dec.2015/Jan.2016
Applications of Nano Technology in Science and Engineering

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 the applications of nano technology in solar cells. (06 Marks)
 - b. Write a note on biomimicry and its applications in renewable energy. (04 Marks)
 - c. Explain about 'plastic solar cells'. (06 Marks)
 - d. How tandem cells produce hydrogen gas? (04 Marks)
- 2
 - a. What are Biosensors? Which are the different types of biosensors? (10 Marks)
 - b. Explain briefly about nano scale carriers. (03 Marks)
 - c. Write short notes on :
 - i) Microfabricated xylem vessels
 - ii) Nano oligo-cellulosic materials and nano tubes.
 - iii) Clay
 (07 Marks)
- 3
 - a. What are Space elevators? What are the applications of nano technology in space elevators? (10 Marks)
 - b. Write a note on future space stations. (07 Marks)
 - c. Write a short note on resources in space. (03 Marks)
- 4
 - a. Explain briefly about the applications of nano technology in removal of toxic heavy metals. (10 Marks)
 - b. Explain about i) protein-polymer biomimetic membrane ii) aligned CNT membrane and iii) thin film nano composite membrane. (03 Marks)
 - c. What is Desalination? Explain the nano filtration process. (07 Marks)

PART - B

- 5
 - a. Explain briefly about different coating methods. (04 Marks)
 - b. Write a note on water repellency and uv - protection. (06 Marks)
 - c. How nanotechnology affected the antistatic and antibacterial properties of textiles? (10 Marks)
- 6
 - a. What are the applications of nano technology in satellites? (06 Marks)
 - b. Explain about applications of nano technology in aeronautics. (04 Marks)
 - c. What are the applications of nano technology towards 'smart suits'? (10 Marks)
- 7
 - a. Write a note on : i) Coulomb blockade and ii) Miniature flash memory. (06 Marks)
 - b. Explain briefly about spintronics and its applications. (04 Marks)
 - c. Write a note on fault tolerant designs. (04 Marks)
 - d. What are quantum computers? Explain its functioning. (06 Marks)
- 8
 - a. Explain about applications of nano technology in building materials, construction and fire protection. (10 Marks)
 - b. Explain about nano assembly and nano coating technology in mechanical manufacturing. (06 Marks)
 - c. Mention the advantages of nano technology in manufacturing engineering. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.