

TXL 740 Science and Applications of Nanotechnology in Textiles

Name:

Entry Number:

12 April 2022

Major Exam (40)

9.00 A.M to 11.00 AM

Que. 1. Fill in the blanks (15)

- A. Composites are defined as
(1)
- B. In nanocomposites the aspect ratio of nanofillers lies in the range
(1)
- C. What will be Surface area to volume ratio of spherical nanoparticles of size 10 nm and 100 nm prepared from a fixed volume of macroparticle 'V'? (2)
- D. In electrospinning ambient conditions of RH and Temp have no effect on diameter of nanofibers. (True/ False) (1)
- E. Nanofibers with beaded structure are formed when
(2)
- F. The full form and chemical structure of hybrid nanoparticle POSS is
..... (2)
- G. If PET fabric is exposed to Plasma under oxygen environment, the changes in surface properties would be
..... (2)
- H. Self-cleaning Textiles are inspired by Lotus leaf effect which is explained as
..... (2)
- I. Layer by Layer coating needs two polyelectrolytes &
..... (2)

← Que 2. What are the three routes for preparation of Polymer Nanocomposites based on nano clays? Discuss the advantages and disadvantages of ~~both~~ ^{at least one}, taking PP as a matrix. (5)

Que 3. A Discuss the electrospinning technique and the principle. What is the importance of Berry's number? (5)

Que 3 B. What is the effect of following parameters of nature of nanofibers produced? (5)

Voltage applied

Polymer Concentration

Distance between tip and plate

Nature of solvent

Effect of Electrolytes

Que 4. If you have to analyze the composition and surface characteristics and properties of silica nanoparticles coated fabric? Which instrumental techniques would you use and what information you will get? (5)

Que5. Write a short note on your assignment topic. (5)