

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1755

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Unique Paper Code : 6092013602

**Name of the Paper : POLYMERIC NANOMATERIALS AND
NANOCOMPOSITES**

Name of the Course : B.SC. (H) POLYMER SCIENCES - UGCF

Semester : VI

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt six question in all. Each question carries 15 marks.
3. Draw neat and labelled diagram wherever necessary.

Q1.

- (a) Explain the major challenges in using nano-reinforcing agents?
 - (b) How to identify if a composite is nano-reinforced?
 - (c) What is Graphene? Explain one method for the preparation of Graphene and also explain its toxicity.
- $3 \times 5 = 15$

Q2.

- (a) How to differentiate between intercalated and exfoliated composites?
 - (b) Write the advantage of combined SAXS/WAXS?
 - (c) How does chain architecture affect the formation of "bridging" networks?
- $3 \times 5 = 15$

Q3.

- (a) Illustrate laser ablation method for the preparation of CNTs?
 - (b) Explain the application of carbon nanotubes?
 - (c) Illustrate the nano structure of POSS along with its application.
- $3 \times 5 = 15$

Q4.

- (a) Explain surface modification techniques for the functionalization of nanoparticles?
 - (b) Explain the major difference between nanocomposites and conventional composites?
 - (c) Discuss the role of interfacial adhesion in the mechanical strengthening of polymer-layered silicate nanocomposites?
- $3 \times 5 = 15$

P.T.O.

Q5.

- (a) Discuss the application of polymeric nanomaterials in the field of drug delivery and water treatment?
- (b) Discuss mechanical grinding method for the synthesis of nanomaterials?
- (c) Discuss the morphology of Polymer-Layered Silicate Nanocomposites? $3 \times 5 = 15$

Q6.

- (a) Discuss the role of L-J potential in polymer nanocomposites?
- (b) Explain the application of polymeric nanomaterials in Medical
- (c) Discuss the types of polymer nanocomposites? $3 \times 5 = 15$

Q7.

- (a) Illustrate properties of Nylon-6/clay nanocomposite?
- (b) What kind of nanomaterials are preferred for fire resistance and weather resistance of a polymeric composite?
- (c) Illustrate the scope of polymeric nanomaterials in future? $3 \times 5 = 15$