

Attempt any five questions

Full Marks-100

1.	<p>(a) What are the different classes of ceramic nanocomposites? Write advantages of ceramic nanocomposites over ordinary composite materials.</p> <p>(b) Discuss the steps of synthesis of ceramic nanocomposites using a high energy ball mill. Name the high energy ball mills that are suitable for nanocomposite synthesis.</p> <p>(c) What is mechanochemical reaction? Discuss the kinetics of mechanochemical reaction. Why this reaction is possible to achieve in ball milling?</p>	<p>2 + 2</p> <p>5 + 2</p> <p>2 + 4 + 3</p>
2.	<p>(a) What are encapsulated composite nanosystems? Discuss the synthesis strategies of different types of encapsulated composites nanosystems. What are the advantages of formation of this type of nanocomposites?</p> <p>(b) Explain why extremely high hardness can be achieved in multilayer and granular nanocomposite coating?</p> <p>(c) Write short note on CNT based ceramic nanocomposites.</p>	<p>2 + 6 + 2</p> <p>6</p> <p>4</p>
3.	<p>(a) What are the different types of fillers added into polymer matrix to produce polymer nanocomposites? Compare among these fillers.</p> <p>(b) Discuss the factors which are responsible for the improvement of mechanical properties of polymer nanocomposites for all the three different types of fillers.</p>	<p>3 + 4</p> <p>5 + 5 + 3</p>
4.	<p>(a) "Modification of the nano fillers before addition into the polymer matrix for processing of polymer nanocomposite is very important." - Justify the sentence for all the types of nano fillers.</p> <p>(b) Discuss in detail with diagram the modification of nano clay layers before addition into the polymer matrix.</p>	<p>2 + 2 + 2</p> <p>14</p>

5.	<p>(a) What are the different methods of modification of equi-axed nano particles before addition into the polymer matrix?</p> <p>(b) highlight all the routes of processing of equi-axed nanoparticle polymer nanocomposite.</p>	<p>10</p> <p>10</p>
6.	<p>(a) What are the different synthesis techniques of CNT for polymer / CNT Nanocomposites?</p> <p>(b) Discuss the modification strategies of CNT for polymer CNT nanocomposites.</p>	<p>8</p> <p>12</p>
7.	<p>(a) What are the main features of nanostructured coating formed by thermal spray method?</p> <p>What are the critical parameters in the deposition of nanocomposite coating by the above mentioned technique?</p> <p>Compare the different thermal spray methods for deposition of nanocomposite coatings.</p> <p>(b) What are functional low dimensional nanocomposites? What are the applications of this types of nano composites? What is the synthesis strategy of this type of nanocomposites?</p>	<p>3 + 3 + 4</p> <p>2 + 2 + 6</p>