

M.Tech. First Semester (Chemical Engineering) (CBS)
13006 : Elective - I : Material Science : 1 CE 5

P. Pages : 2

Time : Three Hours



AV - 3388

Max. Marks : 80

- Notes :
1. Answer **six** questions.
 2. Question No. **one** (1) is compulsory and attempt any five (5) out of remaining nine questions.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Diagrams and chemical equations should be given wherever necessary.
 5. Illustrate your answer necessary with the help of neat sketches.
 6. Discuss the reaction, mechanism wherever necessary.
 7. Cell phones are not permitted.
 8. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) Discuss preparation, properties and uses of silicate materials. 7
b) Discuss preparation, properties and applications of PVC polymer. 8
2. a) State the classification of polymer materials on the basis of thermal response with suitable examples. 6
b) Describe preparation, properties and application of epoxy resin. 7
3. a) Explain advances in metals like carbon and steel. 7
b) Explain mechanical properties of polyethylene polymers. 6
4. a) Discuss preparation, properties and uses of Ion Exchange polymers. 6
b) What is natural rubber? State its chemical structure. How would you prepare natural rubber? 7
5. a) What are the changes takes place during vulcanization of rubber? Discuss Sulphur vulcanization process. 7
b) What is polymer composite? Discuss the role and contribution of each fundamental (constituent). Used in polymer composites. State classification of polymer composite on the basis of origin. 6
6. a) What are the fundamental of composite? Discuss the role and contribution of each fundamental constituent used in polymer composite. Explain the applications of polymer composite in aerospace and marine fields. 13
7. a) What do you mean by package and packaging? Why the need of plastic packaging? Discuss it in detail. 7
b) Discuss centrifugal casting process used in polymer composite preparation. 6

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| 8. | a) | How will you prepare laminated (Multilayer) plastic film? Discuss the role of each layer for three layers laminated plastic film used in food packaging application. | 7 |
| | b) | Discuss heat sealable plastic film used in plastic packaging application. | 6 |
| 9. | a) | Discuss the following type of blending methods used for polymer blends. | 6 |
| | | i) Mechanical blending. ii) Latex-Latex blending. | |
| | | iii) Graft Copolymerization. | |
| | b) | Discuss preparation and properties of PVC-ABS type polymer blend. | 7 |
| 10. | a) | Discuss glass lining and (FRP) fiber reinforced plastics lining equipment's used in chemical process industries. | 7 |
| | b) | Discuss test procedure of fatigue test in polymer material. | 6 |
