

Unique Paper Code : 32177902

Name of the Paper : DSE-2: Inorganic Materials of Industrial Importance

Name of the Course : B.Sc. Prog

Semester : V

Duration : 3 hours

Maximum Marks : 75

Instructions for the Candidates

Attempt **four** questions in all. **All** questions carry equal marks

1. a) What do you mean by solid state battery? Give example. What are the advantages of solid state battery over lithium ion battery?
b) Differentiate between:
 - i) Homogeneous catalyst and heterogeneous catalyst
 - ii) Physical adsorption and chemisorptionc) i) What is the composition and characteristics of quick setting cement?
ii) What is glass? Draw a block diagram for manufacture process of common glass.
(6, 6, 6.75)
2. a) Mention the functions of the following additives in a paint formulation.
 - i) Drier
 - ii) Stabilizer
 - iii) Anti-foaming agentsb) Write the composition, properties and applications of Soda lime glass and Coloured glass
c) Distinguish between prilling and granulation in the manufacture of fertilizers? Outline the safety measures undertaken during the storage and packing of fertilizers.
(6, 6, 6.75)
3. a) What is tinning? How is it carried out?
b) i) Differentiate between silicate and non-silicate glasses.
ii) What are oxide ceramics? Give two examples of oxide ceramics.
c) i) What are the advantages and disadvantages of using zeolites for softening of hard water?
ii) Describing each step to outline the working of the Ziegler-Natta catalyst.
(6, 6, 6.75)
4. a) i) What is the difference between earthenwares and stonewares?
ii) Differentiate between wet and dry process for the manufacture of cement.

b) Write the properties and manufacturing of:

i) Lead Azide

ii) Cyclonite

c). Briefly discuss about Varnish, its constituents and the mechanism of drying.

(6, 6, 6.75)

5. a). Explain the manufacture, properties and applications of Triple superphosphate fertilizer.

b). i) List the different ways by which failure of a paint film can take place.

ii) How does wax differ from polish?

c). Explain briefly the synthesis, structure, properties and applications of the Fullerenes.

(6, 6, 6.75)

6. a). i) What is a battery? Differentiate between primary and secondary batteries.

ii) Why fuel cells are more efficient as compared to conventional gasoline engines for obtaining power by fuel combustion.

b). i) Explain the drying mechanism of an alkyd paint film.

ii) Define pigment volume concentration (PVC). What is its significance?

c). What are explosives? What are the basic requirements of chemical explosives?

(6, 6, 6.75)