[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 505 **K**

Unique Paper Code : 2173010002

Name of the Paper : DSE: Inorganic materials of industrial importance

Name of the Course : **B.Sc. (Prog.) Physical Sciences/Life Sciences**

Semester : V

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **four** questions in all.
3. **All** questions carry equal marks.

1. (a) How the fertilizers are different from manure? Outline the safety measures to be followed during the storage and packing of fertilizers.

   (b) Describe the reactions that occur in the various sections of the rotary kiln when cement is being made. What function does gypsum serve?

   (c) Discuss the composition, properties and applications of any two the glasses:

   (i) BOROSIL glass

   (ii) Coloured glass

   (iii) Photochromic glass (5+5+5)

2. (a) Explain the importance of Nitrogen (N), Phosphorus (P), and Potassium (K) in the life of a plant. What happens to a plant in case of deficiency of each of these nutrients?

   (b) Define pigment volume concentration (PVC) and critical pigment volume concentration (CPVC)? How' do they affect the properties of a paint formulation?

P.T.O.

(c) What is glass transition temperature? List the raw materials used in the manufacturing of glass. Give four properties of glass. (5+5+5)

3. (a) Explain the manufacture, properties and applications of Urea fertilizer.

(b) What are emulsion paints and its constituents? Explain their drying mechanism?

(c) Describe the manufacturing of ceramics? Explain the unique properties that make ceramics different from other materials. (5+5+5)

4. (a) What do you understand by the term CAN? Explain its synthesis.

(b) Why it is important to prepare surface before surface coating? Describe the procedure of electroplating?

(c) Describe the role of the any two additives in a paint formulation:

(i) Plasticizer

(ii) Stabilizer

(iii) Antifoaming agent (5+5+5)

5. (a) Discuss electroless plating with an example. What are its advantages and disadvantages compared to electroplating?

(b) Differentiate between drying oils, semi-drying oils and non-drying oils. Discuss in detail about the safety and health aspects of the paint industry.

(c) Explain the manufacture, properties and applications of superphosphate fertilizer. (5+5+5)

6. (a) Explain briefly the synthesis and properties of potassium fertilizers. What do you mean by 10-10-10 given on a fertilizer package as a code?

(b) What do you mean by Galvanization? How is different from tinning?

(c) Write short note on: **(any two)**

(i) Fire and Heat retardant paints

(ii) Pigments

(iii) Optical fibres (5+5+5)