3 (Sem–6/CBCS) CHE HE 3

2025

CHEMISTRY

(Honours Elective)

Paper : CHE–HE–6036

(Inorganic Materials of Industrial Importance)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions : 1×7=7

   (a) Which of the following is a non-silicate glass ?

   (i) Soda lime glass

   (ii) Lead glass

   (iii) Borosilicate glass

   (iv) Fluoride glass

(b) Borosilicate glass has high thermal resistance. *(True/False)*

(c) _____ is used as a flux in ceramic manufacturing. *(Fill in the blank)*

(d) Which cement type is best suited for underwater construction ?

(i) Portland cement

(ii) Quick-setting cement

(iii) Slag cement

(iv) White cement

(e) What is the function of a thinner in paint ?

(f) Primary batteries can be recharged multiple times. *(True/False)*

(g) ____ is a common oxidizer used in rocket propellants. *(Fill in the blank)*

2. Answer the following questions in brief : 2×4=8

(a) What are the key properties of borosilicate glass ?

(b) What is the role of polyphosphate fertilizers ?

(c) Name *two* key components of oil paint and their functions.

(d) How does a *Li*-battery work ?

3. Answer ***any three*** questions : 5×3=15

(a) Explain the manufacturing process of glass and its classification.

(b) Describe the manufacture and properties of superphosphate fertilizers.

(c) What are metallic coatings ? Explain the process of electrolytic and electroless coating.

(d) Discuss in detail the manufacture and surface treatment of steel.

(e) Explain the role of catalysts in industrial processes with examples.

(f) Discuss the preparation and explosive properties of PETN and RDX.

4. Answer ***any three*** questions : 10×3=30

(a) Discuss the composition, properties, and applications of different types of glasses.

(b) Explain in detail the classification, formulation, and properties of paints and pigments.

(c) Describe the manufacturing process of cement and explain its setting process.

(d) Explain the classification of alloys and the manufacture of steel with relevant chemical reactions.

(e) Describe different types of batteries and explain the working of fuel cells and solar cells.

(f) Discuss in detail the principles of catalysis and phase transfer catalysts with applications.
