# B.Sc. 6th Semester (Honours) Examination, 2025 (CBCS)

## Subject : Chemistry

## Course: DSE-4

## (Inor. mat. of Industrial Importance)

**Time: 2 Hours** **Full Marks: 40**

*The figures in the right hand margin indicate full marks.*
*Candidates are required to give their answers in their own words as far as practicable.*

**1.** Answer *any five* questions: 2×5=10

(a) Mention the importance of NPK fertilizer as the essential nutrient for plants.

(b) Write the composition and use of 'Nichrome'.

(c) What are the differences between SSP and TSP?

(d) Explain the term 'anodizing'.

(e) What are the components of photosensitive glass?

(f) What is meant by 'oil-length'? Mention one use of varnish.

(g) What is phase transfer catalyst? Give an example.

(h) Differentiate between primary and secondary batteries.

**2.** Answer *any two* questions: 5×2=10

(a) State essential ingredients of paints. To have a green coloured glass which specific metal oxide will you use? Write a short note on 'fillers'. 2+1+2

(b) Write the catalytic cycle for the methyl acetate production via the Monsanto acetic acid synthesis. State the composition and properties of sodalime glass. 3+2

(c) What is Heterogeneous catalysis? What are the advantages of heterogeneous catalysis over homogeneous catalysis? Write the full form of PETN and mention its uses. 3+2

(d) Outline the steel manufacturing process. What are the precautions required for RDX storage? 3+2

**3.** Answer *any two* questions: 10×2=20

(a) How calcium ammonium nitrate is prepared in fertilizer industry? Mention all reactions involved. Distinguish between traditional ceramics and high technology ceramics. What are the roles of feldspar in manufacture of ceramics? Give one important application of ceramics in biomedical field. 4+3+2+1

(b) Outline the manufacture of portland cement with mention of raw materials used. What is meant by electroless plating? Mention its advantages. What do you mean by vitrification and devitrification of glass? Distinguish between acidic and basic dyes. 3+3+2+2

(c) In hydroformylation reaction, the active catalyst is generated from the catalyst precursor, $Co_2(CO)_8$ — Comment. Show the schematic representation of polymerisation of propylene using Ziegler–Natta catalyst. Mention special significance of the usefulness of this catalyst. Name the heterogeneous catalyst used in the water gas shift reaction. Write the names of different additives used in paint. 3+4+1+2

(d) Distinguish between an explosion and a detonation. Mention the types of chemical reactions used for making explosives and propellants from thermodynamic point of view. Write the advantages and disadvantages of lithium-ion battery. State the basic principle of a fuel cell. 2+3+3+2

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