

B.Sc. 6th Semester (Honours) Examination, 2021 (CBCS)

Subject: Chemistry

Paper: DSE-4

(Inorganic materials of industrial importance)

Time: 2 Hours

Full Marks: 40

Candidates are required to give their answers in their own words as far as practicable.

Answer any *eight* questions from the following:

$8 \times 5 = 40$

1. Write the hybridization and IUPAC nomenclature of Wilkinson's catalyst. Draw and describe each step involved in the catalytic cycle of hydrogenation of olefins with Wilkinson's catalyst.
2. What is the active catalyst produced from the catalyst precursor $\text{Co}_2(\text{CO})_8$ in hydroformylation reaction? Hydroformylation reaction can produce both the straight chain product (i.e., Anti-Markownikoff product) and branched chain product (i.e., Markownikoff product) – explain.
3. What is a phase transfer catalyst? Give an example. Discuss the mechanistic steps involved in Ziegler-Natta mixed catalyst for the catalyzed synthesis of polymers.
4. **Distinguish between** an explosion and a detonation? What do you mean by the velocity of detonation? Write each one example of primary and secondary explosives. What is the full form of PETN?
5. Explain which physical properties change when metals are made into alloys. **Write the** composition of stainless steel. What is wrought iron?
6. **Define** primary and secondary batteries **with one suitable example for each**. Write the good characteristics of lithium-ion batteries. What are the advantages of fuel cells over other cells?

7. What are the main components needed for painting? What does *metallic coating* mean?
Give an example of emulsifying agents that are used in paint.
8. Discuss the manufacturing processes of, urea and ammonium phosphates **as effective fertilizers**.
9. Write the compositions of soda lime glass and borosilicate glass. How does the photosensitive glass work?
10. **Mention** the main compounds of cement **discussing the setting process**? What are high technology ceramics and their applications?