

SL No of QP : 5885A

Unique paper code : 2173522010

Name of paper : DSE: Applied Inorganic Chemistry

Name of course : BACHELOR OF SCIENCE LIFE SCIENCE

WITH CHEMISTRY

Semester : IV

Duration : 2 Hours

Maximum Marks : 60

Instructions for candidate:

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

- 1) (a) What are the functions of nitrogen, phosphorus, and potassium in plant nutrition? Also, provide two examples of nitrogen-based fertilizers.
(b) Explain the manufacturing process, properties, and agricultural applications of Calcium Ammonium Nitrate (CAN) as a fertilizer.
(c) Differentiate between homogeneous and heterogeneous catalysis, providing one example of each.
(5, 5, 5)
- 2) (a) What are fertilizers? How can they be classified based on their applications?
(b) Describe the complete catalytic cycle of Wilkinson's catalyst, outlining each step involved in its mechanism.
(c) What are the characteristics of a good catalyst? How can a catalyst be deactivated?
(5, 5, 5)



- 3) (a) Explain the mode of action of cisplatin as an anticancer drug.
(b) Describe the possible mechanism for the conversion of synthesis gas (syngas) to synthetic gasoline using the Fischer-Tropsch process.
(c) Explain the following with examples:
(i) Application of zeolites as catalyst.
(ii) Catalytic promoters.

(5, 5, 2.5×2)

- 4) (a) What are superphosphates of lime, and how are they manufactured?
(b) Write a short note on chelation therapy. Mention any two chelating agents and their medicinal applications.
(c) Explain the following terms with examples (*any two*):
(i) Oxidative -addition reaction (ii) Reductive- elimination reaction (iii) Insertion reaction

(5, 5, 2.5×2)

- 5) (a) Explain the manufacture, properties and applications of potassium chloride as a fertilizer.
(b) What is the significance of gold-containing drugs in medicine? Provide relevant examples.
(c) Why are second and third-generation medicines considered more advantageous than first-generation medicines? Provide one example of each type of drug.

(5, 5, 5)

- 6) (a) What is a chelating agent? Discuss the applications of EDTA and DMSA as chelating agents?
(b) Explain following terms:
(i) Urea synthesis carried out at high pressure.
(ii) How does the overuse of urea affect soil pH over time?
(c) List the advantages of biocatalysis over traditional catalysis. Also, explain the limitations of biocatalysis in high-temperature industrial processes.

(5, 2.5×2, 5)

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