93565 MB-301

Sl. No. Total No. of Pages : 4

V Semester III B.Sc. Examination, March/April - 2023

(Semester Scheme) (CBCS) (2018-19 Batch and Onwards)

(DSE-2A) CHEMISTRY (Paper - V)

Time : 3 Hours Max. Marks : 80

Instruction : Write equation and diagram wherever necessary.

Part - A

Answer all the questions : [8 × 1 = 8]

1. a) What is anodizing?

   b) Mention one application of carbon fibres.

   c) Give an example for Sulpha drugs.

   d) State isoprene rule.

   e) Give one importance of Vitamin K.

   f) State Grotthus - Draper's law.

   g) What is Chemiluminescence?

   h) Write the selection rule for vibrational spectra.

Part - B

(Inorganic Chemistry)

Answer any three questions : [3 × 8 = 24]

2. a) Explain the manufacture and processing of glass. [4]

   b) How is potassium sulphate manufactured? [2]

   c) What are water paints and oil paints? [2]

3. a) Write a note on setting process of cement. [3]

b) Give the composition and properties of Sodalime glass. [3]

c) Mention the different types of Fertilizers. [2]

4. a) Give the steps involved in the manufacture of Ceramics. [2]

b) Write a note on : [4]

i) Fire retardant paints.

ii) Plastic paints.

c) Give any two objectives of surface coatings. [2]

5. a) Discuss the manufacture of calcium ammonium nitrate. [3]

b) Write a note on : [3]

i) Carbon nanotubes.

ii) Enamels.

c) Discuss the manufacture of urea. [2]

Part - C
(Organic Chemistry)

Answer any three questions : **[3 × 8 = 24]**

6. a) Give the synthesis of adrenaline. [2]

b) Give any two physical importance of alkaloids. [2]

c) Explain the Skraup's synthesis of Quinoline with mechanism. [4]

7. a) What are terpenes? Write the synthesis of citral. [4]

   b) Elucidate the structure of Vitamin A. [4]

8. a) How is paracetamol synthesised? Give an example of Analgesic. [3]

   b) Write the structure of testosterone. [2]

   c) How is uric acid converted into Caffeine? [3]

9. a) Give the synthesis of thiophene. [2]

   b) Write the structural formula of calciferol. [2]

   c) How do you show the presence of i) Two 3° nitrogen atoms ii) Pyridine ring in nicotine. [4]

Part - D
(Physical Chemistry)

Answer any three questions : **[3 × 8 = 24]**

10. a) Derive the mathematical form of Lambert -Beer's law. [3]

    b) Write the vibrational modes of CO_2 molecule. [3]

    c) Mention the applications of Raman spectra. [2]

11. a) Derive the expression for moment of inertia of a diatomic molecule. [4]

    b) Write a note on photosensitization. [2]

    c) Mention the applications of IR spectroscopy. [2]

12. a) Give reasons for low and high quantum yield. [4]

b) Explain radiolysis of acetic acid. [2]

c) Write a note on Franck - Condon principle. [2]

13. a) Write a note on uranyl oxalate actinometer. [3]

b) How are Stoke's and antistoke's lines formed in Raman spectrum? Explain. [3]

c) Give any two comparison between radiation chemistry and photochemistry. [2]